



Standard Test Method for Compressive Properties of Rigid Plastics¹

This standard is issued under the fixed designation D 695; 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 Department of Defense.

1. Scope *

1.1 This test method covers the determination of the mechanical properties of unreinforced and reinforced rigid plastics, including high-modulus composites, when loaded in compression at relatively low uniform rates of straining or loading. Test specimens of standard shape are employed.

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

NOTE 1—For compressive properties of resin-matrix composites reinforced with oriented continuous, discontinuous, or cross-ply reinforcements, tests may be made in accordance with Test Method D 3410.

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 and health practices and determine the applicability of regulatory limitations prior to use. A specific precautionary statement is given in Note 11.*

NOTE 2—This test method is technically equivalent to ISO 604.

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics for Testing²
- D 638 Test Method for Tensile Properties of Plastics²
- D 883 Terminology Relating to Plastics²
- D 3410 Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading³
- D 4000 Classification System for Specifying Plastic Materials⁴
- D 4066 Classification System for Nylon Injection and Extrusion Materials⁴
- D 5947 Test Methods for Physical Dimensions of Solid Plastics Specimens⁵

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved August 10, 2002. Published October 2002. Originally published as D 695 – 42 T. Last previous edition D 695 – 02.

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 15.03.

⁴ Annual Book of ASTM Standards, Vol 08.02.

⁵ Annual Book of ASTM Standards, Vol 08.03.

- E 4 Practices for Force Verification of Testing Machines⁶
- E 83 Practice for Verification and Classification of Extensometers⁶
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁷

3. Terminology

3.1 General— The definitions of plastics used in this test method are in accordance with Terminology D 883 unless otherwise indicated.

3.2 Definitions:

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

3.2.2 *compressive strain*—the ratio of compressive deformation to the gage length of the test specimen, that is, the change in length per unit of original length along the longitudinal axis. It is expressed as a dimensionless ratio.

3.2.3 *compressive strength*—the maximum compressive stress (nominal) carried by a test specimen during a compression test. It may or may not be the compressive stress (nominal) carried by the specimen at the moment of rupture.

3.2.4 *compressive strength at failure (nominal)*—the compressive stress (nominal) sustained at the moment of failure of the test specimen if shattering occurs.

3.2.5 *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. It is expressed in force per unit area.

3.2.5.1 *Discussion*—The expression of compressive properties in terms of the minimum original cross section is almost universally used. Under some circumstances the compressive properties have been expressed per unit of prevailing cross section. These properties are called “true” compressive properties.

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

⁶ Annual Book of ASTM Standards, Vol 03.01.

⁷ Annual Book of ASTM Standards, Vol 14.02.

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

