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.

Designation: D953 – 18

Standard Test Method for Pin-Bearing Strength of Plastics[1]

This standard is issued under the fixed designation D953; 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 covers the determination of the pin-bearing strength of rigid plastics in either sheet form, molded form, or in reinforced thermoset form. Procedures A and B are applicable for thermoplastic materials in tension loading and compression loading respectively. Procedure C is applicable for thermoset reinforced plastics. See the significance and use section (Section 5) for cautions in using this test standard.

1.2 Test data obtained by this test method is relevant and appropriate for use in quality control and engineering design.

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

NOTE 1—This standard and ISO 12815 address the same subject matter, but differ in technical content.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D618 Practice for Conditioning Plastics for Testing

D883 Terminology Relating to Plastics

D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens

D7290 Practice for Evaluating Material Property Characteristic Values for Polymeric Composites for Civil Engineering Structural Applications

E4 Practices for Force Verification of Testing Machines

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E6 Terminology Relating to Methods of Mechanical Testing

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *ISO Standards:*

ISO 12815 Fibre-reinforced plastic composites—Determination of plain-pin bearing strength[3]

3. Terminology

3.1 *Definitions*—For definitions of technical terms used in this test method and associated with plastics issues refer to terminology contained in ASTM D883.

3.2 *Definitions of Terms Specific to This Standard:*[4]

3.2.1 *pin-bearing area*—the diameter of the hole multiplied by the thickness of the specimen.

3.2.2 *pin-bearing strength*—the pin-bearing stress at which the pin-bearing hole is deformed 4 % of its diameter for thermoplastics. For thermosets, the pin-bearing strength is the maximum pin-bearing stress at which the sample fails.

3.2.3 *pin-bearing stress*—the applied load in newtons (or pounds-force) divided by the pin-bearing area in mm^2 (or in^2).

3.2.4 *edge distance ratio*—the distance from the center of the pin-bearing hole to the edge of the specimen in the direction of loading, divided by the diameter of the hole.

3.2.5 *maximum pin-bearing stress*—the maximum load in newtons (or pounds-force) sustained by the specimen, divided by the bearing area.

4. Summary of Test Method

4.1 This test standard is intended to test the pin-bearing strength of thermoplastic material using procedures A, B and

[1] This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.18 on Reinforced Thermosetting Plastics.

Current edition approved Nov. 1, 2018. Published November 2018. Originally approved in 1948. Last previous edition approved in 2010 as D953 - 10. DOI: 10.1520/D0953-18.

[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.

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

[4] Attention is also directed to Terminology E6.

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

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States