



Designation: D785 – 23

Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials¹

This standard is issued under the fixed designation D785; 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 two procedures for testing the indentation hardness of plastics and related plastic electrical insulating materials by means of the Rockwell hardness tester.

1.2 The values stated in SI units are to be regarded as standard. The values given 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 2039-2 are equivalent. Procedure A of this test method is equivalent to the test method in the main body of ISO 2039-2. Procedure B of this test method is equivalent to the test method in the integral annex part of ISO 2039-2.

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](#)

[D883 Terminology Relating to Plastics](#)

[D2240 Test Method for Rubber Property—Durometer Hardness](#)

[D4000 Classification System for Specifying Plastic Materials](#)

[E18 Test Methods for Rockwell Hardness of Metallic Materials](#)

[E456 Terminology Relating to Quality and Statistics](#)

[E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method](#)

[E2935 Practice for Evaluating Equivalence of Two Testing Processes](#)

2.2 ISO Standards³

[ISO 2039-2 Plastics—Determination of Hardness—Part 2: Rockwell Hardness](#)

3. Terminology

3.1 Definitions used in this test method are in accordance with Terminology [D883](#).

3.2 For definitions of terms that appear in this practice relating to quality and statistics (such as precision and bias), refer to Terminology [E456](#).

3.3 Definitions of Terms Specific to This Standard:

3.3.1 *indentation hardness*—the resistance of a material to surface penetration or plastic deformation.

4. Significance and Use

4.1 A Rockwell hardness number is a number derived from the net increase in depth impression as the load on an indenter is increased from a fixed minor load to a major load and then returned to a minor load (Procedure A). A Rockwell alpha (α) hardness number represents the maximum possible remaining travel of a short-stroke machine from the net depth of impression, as the load on the indenter is increased from a fixed minor load to a major load (Procedure B). Indenters are round steel balls of specific diameters. Rockwell hardness numbers are always quoted with a scale symbol representing the indenter size, load, and dial scale used. This test method is based on Test Methods [E18](#). Procedure A (Section 11) yields the indentation of the specimen remaining 15 s after a given major load is released to a standard 10-kg minor load. Procedure B (Section 12) yields the indentation of the indenter

¹ This method is under the jurisdiction of ASTM Committee [D20](#) on Plastics and is the direct responsibility of Subcommittee [D20.10](#) on Mechanical Properties.

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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.

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