



Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor¹

This standard is issued under the fixed designation D 2583; 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 indentation hardness of both reinforced and nonreinforced rigid plastics using a Barcol Impressor, Model No. 934-1 and Model No. 935.

1.2 The values stated in SI units are to be regarded as the 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 and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is currently no ISO standard that duplicates this test method.

2. Referenced Documents

2.1 ASTM Standards:

- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²
- D 883 Terminology Relating to Plastics²
- D 4000 Classification System for Specifying Plastic Materials³
- D 4805 Terminology of Plastics Standards³
- E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

3. Terminology

3.1 **Definitions**—For definitions of technical terms pertaining to plastics used in this test method, see Terminology D 883 or Terminology D 4805.

4. Summary of Test Method

4.1 Model No. 934-1 is used for measuring harder materials and Model No. 935 is used for measuring softer materials.

5. Significance and Use

5.1 The Barcol Impressor is portable and therefore suitable for testing the hardness of fabricated parts and individual test specimens for production control purposes.

5.2 For many materials, there may be a specification that requires the use of this test method, but with some procedural modifications that take precedence when adhering to the specification. Therefore, it is advisable to refer to that material specification before using this test method. Table 1 of Classification System D 4000 lists the ASTM materials standards that currently exist.

6. Apparatus (Fig. 1 and Fig. 2)

6.1 **Indenter**—The indenter shall consist of a hardened steel truncated cone having an angle of 26° with a flat tip of 0.157 mm (0.0062 in.) in diameter. It shall fit into a hollow spindle and be held down by a spring-loaded plunger. See Fig. 2.

6.2 **Indicating Device**—The indicating dial shall have 100 divisions, each representing a depth of 0.0076-mm (0.0003-in.) penetration. The higher the reading the harder the material.

6.3 **Calibration Standards**—“Hard” and “soft” aluminum alloy disks supplied by the manufacturer of the instrument. Other disks should not be used, even if they are of the same alloy and temper as the manufacturer’s disks, as the hardness of aluminum may vary within any given alloy-temper parameter.

6.4 A smooth glass plate is also needed.

7. Test Specimens

7.1 The testing area shall be smooth and free from mechanical damage.

7.2 **Dimensions**—Test specimens shall be at least 1.5 mm ($\frac{1}{16}$ in.) thick and large enough to ensure a minimum distance of 3 mm ($\frac{1}{8}$ in.) in any direction from the indenter point to the edge of the specimen.

8. Preparation and Operation of Apparatus

8.1 The preparation and operation of Models 934-1 and 935 are identical. Place the impressor and the material to be tested (or the calibration disk) on a solidly supported, flat, hard, firm surface such as stone, metal, or ceramic. If softer supporting surfaces are used, a falsely low instrument reading may occur.

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.10 on Mechanical Properties. Current edition approved Oct. 10, 1995. Published December 1995. Originally published as D 2583 – 67. Last previous edition D 2583 – 93.

² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 08.03.

⁴ Annual Book of ASTM Standards, Vol 14.02.