



Standard Test Methods for Resistance of Plastic Materials to Abrasion¹

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

1. Scope

1.1 These test methods cover the determination of the resistance to abrasion of flat surfaces of plastic materials, measured in terms of volume loss, by two different types of abrasion-testing machines, as follows:

1.1.1 *Test Method A*—Loose abrasive, and

1.1.2 *Test Method B*—Bonded abrasive on cloth or paper (abrasive tape).

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

NOTE 1—There is no similar or equivalent ISO standard.

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.*

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 Standards⁴

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁵

3. Terminology

3.1 *Definitions*—For definitions of technical terms pertaining to plastics used in these test methods, see Terminology

D 883 or Terminology D 4805.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *resistance to abrasion*—the ability of a material to withstand mechanical action such as rubbing, scraping, or erosion, that tends progressively to remove material from its surface.

4. Significance and Use

4.1 The measurement of the resistance to abrasion of plastic materials is very complex. The resistance to abrasion is affected by many factors such as the physical properties of the polymeric material, particularly hardness, resilience, and the type and degree of added filler such as cellulose fiber or pigment. Resistance to abrasion is also affected by conditions of the test, such as the nature of the abradant, action of the abradant over the area of the specimen abraded, and development and dissipation of heat during the test cycle.

4.2 Although laboratory measurement of the resistance to abrasion of a given material may be closely allied, in some instances, to material quality, results should not be used as an absolute index of ultimate life, particularly in view of varied end-use applications. Correlation of laboratory abrasion data with end-use performance depends upon the ability to assess those actions in service which affect durability, and it is for this reason that many different types of testing machines have been employed. Results from machines such as those described in these test methods are of value chiefly in the development of materials, and should not be used without qualification as a basis for commercial comparisons.

4.3 The procedures described in these test methods have been prepared in an attempt to standardize methods of test used for measuring abrasion resistance of plastic materials. It is believed that the standardization of such test methods, plus the addition of new test methods as developed, and subsequent choice of that test method most closely simulating service conditions, will provide a means of measuring durability of plastic materials for a given application. These test methods have been prepared in an attempt to attain these objectives.

4.4 For many materials, there may be a specification that requires the use of these test methods, but with some procedural modifications that take precedence when adhering to the specification. Therefore, it is advisable to refer to that material

¹ These test methods are under the jurisdiction of ASTM Committee D-20 on Plastics and are the direct responsibility of Subcommittee D20.10 on Mechanical Properties.

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This edition includes the addition of an ISO equivalency statement.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.02.

⁴ *Annual Book of ASTM Standards*, Vol 08.03.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.