



Designation: D1044 – 24

Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser¹

This standard is issued under the fixed designation D1044; 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 describes a procedure for estimating the resistance of transparent plastics to one kind of surface abrasion by measuring the change in optical properties.

1.2 Abrasive damage is numerically quantified by calculating the difference in haze percentage in accordance with Test Method **D1003** between an abraded and unabraded specimen.

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

NOTE 1—This test method is equivalent in the measurement of resistance to abrasion of ISO 3537, Section 8 and ISO 15082, Section 11, but is not equivalent in any other measurement or section. This test method is not equivalent to ISO 9352, and results cannot be directly compared between the two methods.

NOTE 2—This test method is similar to SAE J3097 / ANSI Z26.1, Test 12.

NOTE 3—Prior attempts to employ the Taber Abraser for volume loss determinations of various plastics² have been unsuccessful because of excessively large coefficients of variation attributed to the data. Insufficient agreement among the participating laboratories has rendered the use of volume loss procedure inadvisable as an ASTM test method.

NOTE 4—For determining the resistance to abrasion of organic coatings by weight loss, reference is made to Test Method **D4060**, which uses more aggressive CS-10 or CS-17 abrasive wheels.

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.*

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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:³

- D883** Terminology Relating to Plastics
- D1003** Test Method for Haze and Luminous Transmittance of Transparent Plastics
- D4000** Classification System for Specifying Plastic Materials
- D4060** Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- E456** Terminology Relating to Quality and Statistics
- E691** Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method
- G195** Guide for Conducting Wear Tests Using a Rotary Platform Abraser

2.2 ISO Standards:⁴

- ISO 3537** Road Vehicles—Safety Glazing Materials—Mechanical Tests
- ISO 9352** Plastics—Determination of Resistance to Wear by Abrasive Wheels
- ISO 15082** Road Vehicles—Tests for Rigid Plastic Safety Glazing Materials

2.3 ANSI Standards:⁴

- SAE J3097 / ANSI Z26.1** Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways—Safety Standard

3. Terminology

3.1 *Definitions*—Terms used in this test method are defined in accordance with Terminology **D883**, unless otherwise specified. For terms relating to precision and bias and associated

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² Supporting data are available from ASTM Headquarters. Request RR:D20-48 and RR:D20-1090.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ 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