



Designation: D7255 – 22^ε¹

Standard Test Method for Abrasion Resistance of Leather (Rotary Platform, Abraser Method)¹

This standard is issued under the fixed designation D7255; 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.

^ε¹ NOTE—Figure X2.1, Visual Grading Scale, was updated editorially to show better contrast in November 2022.

1. Scope*

1.1 This test method covers the determination of the abrasion resistance of leather using the rotary platform abraser.

NOTE 1—This test method is similar but not equivalent to ISO 17076-1, and results should not be directly compared between the two methods.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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

D1517 Terminology Relating to Leather

D1610 Practice for Conditioning Leather and Leather Products for Testing

D2813 Practice for Sampling Leather for Physical and Chemical Tests

G195 Guide for Conducting Wear Tests Using a Rotary Platform Abraser

2.2 Other Standards:³

ISO 17076-1 Leather—Determination of abrasion resistance
Part 1—Taber method

3. Terminology

3.1 Definitions:

3.1.1 *abraser*—a wear testing instrument, also referred to as a rotary platform tester or abrader.

3.1.2 *abrasion*—the wearing away of any part of a material by rubbing against another surface.

3.1.3 *abrasion cycle*—in *abrasion testing*, one or more movements of the abradant across a material surface, or the material surface across the abradant, that permits a return to its starting position. In the case of the rotary platform test method, it consists of one complete rotation of the specimen.

3.1.4 *durability*—the ability to withstand deterioration or wear out in use, including the effects of abrasion.

3.1.5 *resurface*—the preparation of an abrasive wheel on a refacing disc or diamond tool wheel refacer, prior to use in testing.

3.2 For definitions of other leather terms used in this test method, refer to Terminology **D1517**.

4. Summary of Test Method

4.1 A specimen is abraded using rotary rubbing action under controlled conditions of pressure and abrasive action. The test specimen, mounted on a turntable platform, turns on a vertical axis, against the sliding rotation of two abrading wheels. One abrading wheel rubs the specimen outward toward the periphery and the other, inward toward the center, while a vacuum system removes wear debris generated during the test. The resulting abrasion marks form a pattern of crossed arcs over an area of approximately 30 cm². Resistance to abrasion is evaluated by visual inspection of damage to the specimen or change in mass, as described in Section 14.

¹ This test method is under the jurisdiction of ASTM Committee **D31** on Leather and is the direct responsibility of Subcommittee **D31.07** on Physical 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

5. Significance and Use

5.1 The resistance of leather to abrasion, as measured on a testing machine in the laboratory, is generally only one of several factors contributing to wear performance or durability as experienced in the actual use of the material. While “abrasion resistance” (often stated in terms of the number of abrasion cycles) and “durability” are frequently related, the relationship varies with different end uses and different factors may be necessary in any calculation of predicted durability from specific abrasion data. This test method provides a comparative ranking of material performance, which can be used as an indication of relative end-use performance.

5.2 The resistance of leather to abrasion may be affected by factors including test conditions; type of abradant; pressure between the specimen and abradant; mounting or tension of the specimen; and type, kind, or amount of finishing materials.

5.3 Abrasion tests utilizing the rotary platform abraser may be subject to variation due to changes in the abradant during specific tests. Depending on abradant type and test specimen, the abrasive wheel surface may change (that is, become clogged) due to the pick up of finishing or other materials from test specimens. To reduce this variation, the abrasive wheels must be resurfaced at regularly defined intervals.

5.4 The measurement of the relative amount of abrasion may be affected by the method of evaluation and influenced by the judgment of the operator.

6. Apparatus

6.1 *Rotary Platform Abraser*,⁴ as described in Guide G195 and consisting of the elements described in 6.1.1 – 6.1.5 (see Fig. 1).

6.1.1 A turntable platform, which is removable, that includes a rubber pad, clamp plate and centrally located threaded post and nut. When testing flexible specimens, the turntable platform will also include a clamping ring to secure the specimen to the turntable. The turntable shall be motor driven and mounted so as to produce a circular surface travel of an essentially flat specimen in the plane of its surface,

6.1.2 A motor capable of rotating the turntable platform at a speed of either 72 ± 2 r/min or 60 ± 2 r/min,

6.1.3 A pair of pivoted arms to which the abrasive wheels and accessory weights or counterweights are attached,

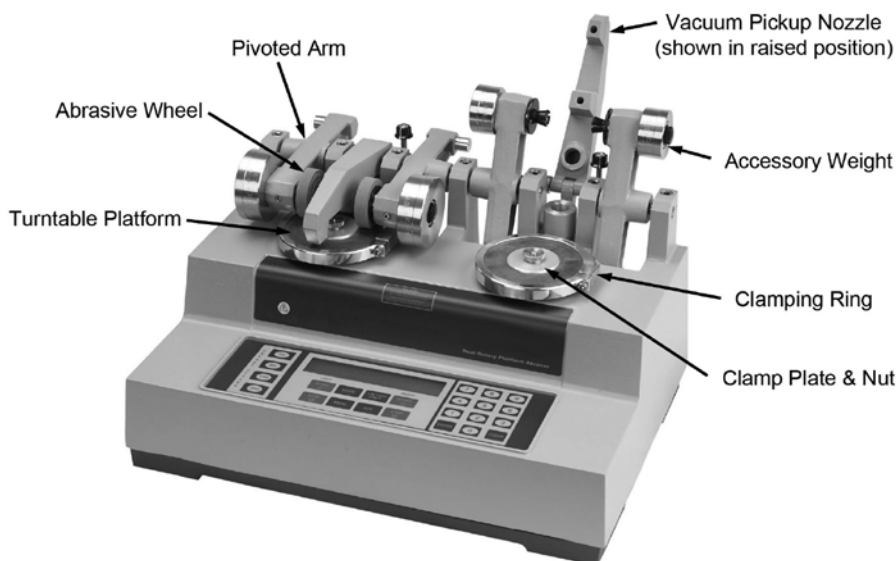
6.1.4 A vacuum suction system and vacuum pickup nozzle to remove debris and abrasive particles from the specimen surface during testing. The height of the vacuum pickup nozzle shall be adjustable, and will have two 8 mm openings. One opening shall be positioned between the two wheels and over the wear path and the other placed diametrically opposite. The distance between the axes of the two openings shall be 76.0 ± 1.0 mm, and

6.1.5 A counter to record the number of abrasion cycles (revolutions) made by the turntable platform.

6.2 *Abrasive Wheels*,⁵ which are attached to the free end of the pivoted arms, and are able to rotate freely about horizontal spindles. The abrasive wheels are either resilient (such as type CS-10 or CS-17) or vitrified based (such as type H-18 or H-22), with both types of wheels consisting of hard particles embedded in a binder material and manufactured in different grades of abrasive quality. Other types of wheels, which do not include hard particles embedded in a binder material, may also be used.

⁴ Available from Taber® Industries, 455 Bryant Street, North Tonawanda, NY 14120.

⁵ The sole source of supply of the apparatus known to the committee at this time is Taber Industries, 455 Bryant Street, North Tonawanda, NY 14120. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.



Note: Vacuum Suction System not shown

FIG. 1 Rotary Platform, Abraser