



Designation: D2346 – 21

Standard Test Method for Apparent Density of Leather¹

This standard is issued under the fixed designation D2346; 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 the determination of the apparent density of specimens of leather. This test method does not apply to wet blue or wet white.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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
- D1610 Practice for Conditioning Leather and Leather Products for Testing
 - D1813 Test Method for Measuring Thickness of Leather Test Specimens
 - D2347 Test Method for Measuring Area of Leather Test Specimens

3. Terminology

3.1 Definitions:

¹ This test method is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.03 on Footwear. This test method was developed in cooperation with the American Leather Chemists Assn. (Standard Method E62 – 1972).

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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.

3.1.1 *apparent density*—the weight of a unit volume of bulk leather conditioned according to Practice D1610.

4. Significance and Use

4.1 This test method is designed to determine the apparent density of specimens from their area and thickness. By measuring apparent density, the degree of loading or of compression of leather can be evaluated. The test method is unsuitable for very soft leathers such as chamois whose thickness cannot be accurately measured by the test method cited.

5. Apparatus

- 5.1 *Round Die*, 2.7 in. to 3.0 in. (68.6 mm to 76.2 mm) in diameter.
- 5.2 *Mallet or Clicking Machine*.
- 5.3 *Rule or Steel Tape*, graduated in 1/32 in. or 0.02 in. or in millimetres.
- 5.4 *Balance* and set of weights.
- 5.5 *Thickness Gauge* as described in Test Method D1813.

6. Test Specimen

6.1 The test specimen shall be a disk of leather that has been conditioned as specified in 3.1.1. This specimen may be the same as that used in Test Method D2347.

7. Procedure

- 7.1 Weigh the specimen to the nearest 0.001 g.
- 7.2 Measure the thickness to the nearest 0.025-cm in four quadrants of the specimen disk, equidistant from the rim and center (10 mil = 0.025 cm).
- 7.3 Measure the area to the nearest second decimal place in accordance with Test Method D2347.

8. Calculation and Report

8.1 Calculate the apparent density to the second decimal place by dividing the weight of the specimen in grams by the product of area in square centimetres and the average thickness in centimetres.

9. Precision and Bias

9.1 Results by the same operator on duplicate, adjacent specimens from the same skin should not be considered suspect unless the coefficient of variation exceeds 4 %.

9.2 Results of two laboratories on duplicate specimens, same skin, should not be considered suspect unless the coefficient of variation exceeds 10 %.

10. Keywords

10.1 apparent density; area; leather; thickness

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