



Designation: D6015 – 21

Standard Test Method for Static Water Absorption of Leather¹

This standard is issued under the fixed designation D6015; 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 amount of water absorbed by leather at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ by immersion under static conditions. It may be used on all types 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

[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](#)

3. Terminology

3.1 For definitions of leather terms used in this test method refer to Terminology [D1517](#).

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.

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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.

4. Summary of Test Method

4.1 In this test method the amount of water absorbed by a leather specimen is measured at room temperature with all surfaces exposed to water.

5. Significance and Use

5.1 This test method is used to determine compliance with specifications for water absorption of upper leather. The significance of the test method is limited by the static conditions employed, and the results do not reflect the water absorption under dynamic conditions of flexing.

6. Apparatus

6.1 *Beaker*, 1000 mL.

6.2 *Balance*, sensitive to 0.01 g.

6.3 *Blotting Paper*.³

6.4 *Timer*.

6.5 *1000 g of weight*.

7. Test Specimen

7.1 When taking test specimens from skins or hides refer to Practice [D2813](#).

7.2 The test specimen shall be a square of leather approximately 4 in. by 4 in. (102 mm by 102 mm).

7.3 Unless otherwise specified in the detail specification, one specimen from each test unit of sample shall be tested.

7.4 Prior to testing, the specimen shall be conditioned according to Practice [D1610](#).

8. Procedure

8.1 Weigh the specimen to the nearest 0.01 g and record the mass as W_1 .

8.2 One to three specimens shall be completely immersed in a 1000 mL beaker of distilled water at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$. This

³ Blotting paper suitable to meet requirements of this method can be purchased at either: AATCC, Order #08344a, P.O. Box 12215, Research Triangle Park, NC 27709-2215, www.aatcc.org or Testfabrics Inc., P.O. Box 26, West Pittston, PA 18643, www.testfabrics.com.

should be done in such a manner that the surface of the specimens do not touch each other.

8.3 After $1\text{ h} \pm 1\text{ min}$ or other agreed upon immersion time interval, the specimens shall be removed from the beaker and the surface water from each removed by lightly blotting the specimen with blotting paper prior to weighing.

8.4 Blotting paper that has been cut to the same size as the leather test specimen shall be used. A 4 in. by 4 in. (102 mm by 102 mm) non-water absorbing, rigid flat plate shall be placed on a level surface. Two dyed squares of blotting paper shall be stacked upon the rigid flat plate. One test specimen shall be removed from the container and placed, grain up on top of the blotting squares. Two more blotting paper squares shall be placed upon the first specimen. A second specimen shall be removed from the container and placed grain up upon the stack. This procedure shall be repeated until all the specimens are removed from the container and stacked. Two squares of blotting paper shall be placed on the last specimen added to the stack. The stack shall be topped by a second non-water absorbing, rigid flat plate. The entire stack shall be immediately squared (that is, the edges of the specimen, blotters and plates shall be made flush), and 1000 g weight shall be centered on top of the upper plate. Note: the total time required for removing the specimen from the container forming the stack and placing the 1000 g weight upon the stack shall not exceed 3 min. The 1000 g weight shall remain on the stack for 5 min. At the end of 5 min, the weight shall be removed. The stack, held together by the plates, shall be turned upside down and in this position returned to the level surface. The 1000 g weight shall again be centered on top of the upper plate and allowed to remain for 5 min. The alignment of the stack shall not be

disturbed during this procedure. At the end of 5 min, the weight, top plate, and first two blotters shall be removed.

8.5 The specimen shall then be weighed immediately and the mass recorded as W_2 .

9. Calculation

9.1 The amount of water absorbed by each specimen shall be calculated as follows:

$$\text{Water absorbed, \%} = [(W_2 - W_1)/W_1] \times 100 \quad (1)$$

where:

W_1 = weight of the original specimen, grams, and
 W_2 = weight of the specimen after water immersion, grams.

10. Report

10.1 The amount of water absorbed by the specimen shall be reported to the nearest 0.01 %.

10.2 The immersion time interval.

11. Precision and Bias

11.1 This test method is adopted from the procedures of the Federal Government where it has long been in use. It was approved for publication before the inclusion of precision and bias statements was mandated. The original interlaboratory test data is no longer available. The user is cautioned to verify by use of reference materials, if available, that the precision and bias of this test method is adequate for contemplated use.

12. Keywords

12.1 leather; static; water absorption

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