



Designation: D 5052 – 00

Standard Test Method for Permeability of Leather to Water Vapor¹

This standard is issued under the fixed designation D 5052; 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.

1. Scope

1.1 This test method covers the determination of the permeability of leather to water vapor by measuring the rate at which water vapor passes through a test specimen. This test method does not apply to wet blue.

1.2 The values stated in either inch-pound or SI units are to be regarded separately as standard. The values stated in each system may not be exact equivalents, therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the 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 1610 Practice for Conditioning Leather and Leather Products for Testing²

3. Summary of Test Method

3.1 In this test method the water vapor permeability is measured after the test specimen is exposed to moist air on one side and dry air on the other side.

4. Significance and Use

4.1 This test method is intended for use on all types of leathers.

4.2 Water vapor permeability is one of several factors contributing to the relative comfort of footwear, handwear, and garments.

5. Apparatus

5.1 *Analytical Balance*, accurate to 0.001 g.

5.2 *Permeability Apparatus*, as shown in Fig. 1. It shall consist of an aluminum cup having approximately the dimen-

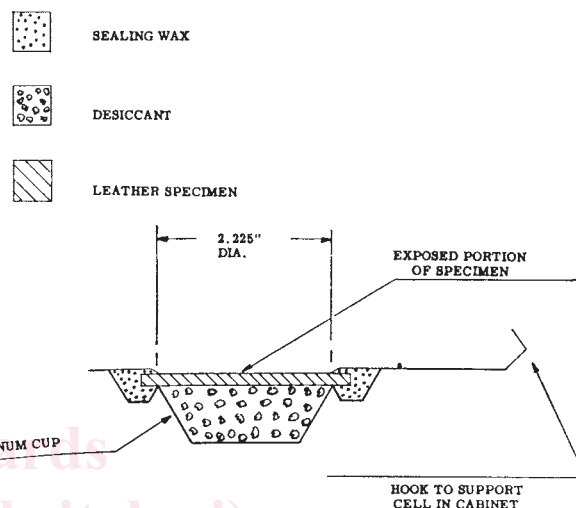


FIG. 1 Permeability Apparatus

sions shown in Fig. 2 and a template, $\frac{1}{8}$ in. thick and 2.225 ± 0.025 in. in diameter [area is 0.0025 m^2 , or 25 cm^2], made of brass or other non-corrosive metal.

5.3 *Steel Stamping Die*, 2.75 ± 0.1 in. in diameter.

5.4 *Constant Temperature and Humidity Chamber*, which may be either a laboratory, a cabinet, or a chamber with circulated air maintained at standard condition ($23 \pm 1^\circ\text{C}$ and $50 \pm 4\%$ relative humidity).

5.5 *Fan*, capable of maintaining an air-flow over the surface of the *Permeability Apparatus* at a velocity of at least 500 ft/min [254 m/s].

6. Reagents and Materials

6.1 *Dessicant*, consisting of fresh 8 mesh anhydrous calcium chloride.

6.2 *Microcrystalline Wax*, with a melting point of 70°C or lower.

7. Procedure

7.1 All specimens shall be conditioned as prescribed in Practice D 1610. Conditioning other than as prescribed shall be noted in the results.

7.2 Fill the aluminum cup with the desiccant to a height between $\frac{1}{8}$ and $\frac{1}{4}$ in. [3.2 to 6.4 mm] below the level of the rim, as shown in Fig. 1. Leave enough space so that shaking of the dish, which must be done after each weighing, will mix the

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² *Annual Book of ASTM Standards*, Vol 15.04.