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**Test methods for permeability to water vapor of
leather**

皮革透水汽性试验方法

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Test methods for permeability to water vapor of leather

1 Subject content and scope of application

This standard specifies the test principles, test instruments, specimen preparation, test procedures, calculations and test reports of permeability to water vapor of leather, under standard conditions.

This standard applies to all leathers.

2 Normative references

GB 4689.1 Leather - Laboratory sample - Location and identification

GB 4689.2 Leather - Conditioning of test pieces for physical tests

3 Test principle

Under certain temperature and humidity conditions, the leather test piece is fixed at the mouth of the moving test bottle. The test bottle contains a solid desiccant. When the test bottle moves, the water vapor passes through the leather test piece AND is absorbed by the solid desiccant. Within the specified period of time, the test bottle is weighed, to determine the weight of moisture, which is absorbed by the desiccant, through the leather.

4 Instruments and materials

4.1 The components of the leather water vapor permeability tester shall meet the following requirements.

- a. Test bottle: As shown in Figure 1, it is equipped with a threaded cap. The cap has a circular hole, which has a diameter of 30 mm. The circular hole is equal to the inner diameter of the bottle bottleneck. The plane of the bottle mouth is perpendicular to the inner wall of the bottleneck.
- b. Test bottle holder: It is driven by a motor. The rotation speed is 75 ± 5 rpm. The test bottle is placed on this circular holder. The axis of the test bottle shall be parallel to the axis of the circle. The two axes shall be 67 mm

the specimen, with the use side facing inward, on the bottle mouth. Then fix the test bottle on the test bottle holder. Turn on the instrument.

6.2 Use a vernier caliper to measure the inner diameter of the second test bottle's mouth, in two mutually perpendicular directions. Mark the average value of the diameter d , accurate to 0.1 mm.

6.3 If necessary, apply a washer or coat a layer of beeswax, between the bottle mouth and the test piece. OR take other measures to prevent air leakage.

6.4 After the instrument has been rotated for 16 hours, shut it down. Remove the first test bottle. Put the other half of the freshly dried silica gel (59.0 ± 0.5 g) into the second test bottle. Remove the specimen from the first test bottle, as soon as possible; fix it on the second test bottle, with the use side inwards.

6.5 Weigh the second test bottle. Record the weighing time. Then fix the second test bottle on the instrument.

6.6 When the instrument rotates for 7 hours, shut it down. Remove the test bottle. Weigh it. Record the weighing time.

7 Test results

$$P = \frac{7639m}{d^2 \cdot t}$$

Where:

P - Water vapor permeability, mg/ (cm²·h);

m - The increased mass of the bottle at the second weighing, mg;

d - The diameter of the bottle mouth, cm;

t - The time between two weighing, h.

8 Test report

The test report includes the following.

- a. The name and source of the tested sample;
- b. Each measurement result, the arithmetic average of multiple results;
- c. Sample retention and test conditions;
- d. Temporary factors that may have an impact on the test results.

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