



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 40938-2021

**Leather - Physical and mechanical tests - Determination of
water penetration pressure**

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1 Scope

This document specifies a test method for determining the water penetration pressure of leather.

This document is applicable to the determination of the water penetration pressure of various types of leather.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 6682 Water for analytical laboratory use -- Specification and test methods (GB/T 6682-2008, ISO 3696:1987, MOD)

GB/T 39364 Leather - Chemical, physical, mechanical and fastness tests - Sampling location (GB/T 39364-2020, ISO 2418:2017, MOD)

QB/T 2707 Leather -- Physical and mechanical tests -- Sample preparation and

conditioning (QB/T 2707-2018, ISO 2419:2012, MOD)

3 Terms and definitions

There are no terms and definitions that need to be defined in this document.

4 Principles

Fix the leather sample above a container filled with water, and make the surface of the sample touch the water; then, increase the water pressure at a certain rate, and record the pressure when the water penetrates the leather sample and the water droplets form, that is the water penetration pressure of the leather sample.

requirements for humidity. The sample does not need to be adjusted in the air. If required by the relevant parties, the test can also be carried out after the adjustment of the humidity; the adjustment shall be indicated in the test report.

7 Test steps

7.1 Fill the water cup (5.1) with distilled water or deionized water (5.5), do that at the specified temperature (see 6.3).

7.2 Put the leather sample on the water cup and make its surface (the exposed surface when it is used) touch the water; fix the sample with a hard wire mesh.

Note: The hard wire mesh is used to prevent the swelling of the leather sample during the test.

7.3 Apply pressure to the water and make the pressure increase evenly at a rate of (3 ± 0.3)

kPa/min until the end of the test.

7.4 Observe the side of the leather sample that is not in direct contact with the water.

When the water penetrates the leather sample to form the third drop of water, record the water pressure at this time, that is the water penetration pressure of the sample.

Note 1: Take the formation of the third drop of water (not the first drop) as the end point, to avoid some larger capillaries on the sample affecting the results.

Note 2: If the waterproof performance of the leather sample is poor, then after testing, the side of the sample that is not in direct contact with water will be wet, instead of the appearance of the discrete water droplets. At this time, the results are not reliable, and this method is not applicable. If the test result is < 2.5 kPa, then the test result is ineffective for comparing the water repellency between leather samples.

Note 3: Do not consider the fine water droplets that no longer expand after penetrating the

sample. Do not count the continuous water droplets that form at the same part of the sample.

Note 4: During the test, if the sample bulges, or the water spurts due to the sample cracking, record the pressure value at this time, and explain in detail in the report.

7.5 When the water pressure increases to (65 ± 0.3) kPa, if the third drop of water does not form on the side of the sample that is not in direct contact with water, then the test ends.

8 Representation of the result

8.1 Record the water penetration pressure of the sample, it shall be accurate to 0.1 kPa.

If in the normal test process, the water pressure increases to (65 ± 0.3) kPa, and the third drop of water does not form on the side of the leather sample that is not in direct contact with water, then record the test result as "water penetration pressure >65 kPa".

8.2 If the side of the sample that is not in direct contact with water becomes wet, it shall be specified in the test report; there is no need to record the water penetration pressure.

Note: Sometimes, the water penetration pressure is expressed in millimeters of mercury (mmHg) or centimeters of mercury (cmHg). If these units are used in the test report, The conversion relationship between the three is $1 \text{ kPa} = 7.5 \text{ mmHg} = 0.75 \text{ cmHg}$.

9 Test report The test report shall contain the following:

- a) The number of this document;
- b) The detailed information of the sample; if the sampling is inconsistent with GB/T 39364, explain the situation;
- c) The test temperature, $(20 \pm 2)^\circ\text{C}$ or $(23 \pm 2)^\circ\text{C}$;
- d) The water penetration pressure of each sample, in kilopascals (kPa), millimeters of mercury (mmHg) or centimeters of mercury (cmHg);
- e) The situation at the time that the side of the sample that is not in direct contact with water becomes wet;
- f) Any other anomalies that occur during the test;
- g) Any deviation from the methods specified in this document.