

ICS 59.140.30



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

GB/T 45711.1-2025

**Leather - Determination of tear load - Part 1: Single edge tear
(English Translation)**

Issued on: May 30, 2025

Implemented on: December 1, 2025

Issued by: State Administration for Market Regulation

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1 Scope

This document describes a test method for determining the tear load of leather using the single edge tear (i.e., trouser tear) method.

This document is applicable to the determination of the tear load of various types of leather.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 39364 Leather - Chemical, Physical, Mechanical and Fastness Tests - Sampling Location (GB/T 39364-2020, ISO 2418.2017, MOD)

GB/T 45705 Leather - Physical and Mechanical Tests - Determination of Thickness (GB/T 45705-2025, ISO 2589.2016, MOD)

QB/T 2707 Leather - Physical and Mechanical Tests - Sample Preparation and Conditioning

3 Terms and Definitions

This document does not have terms or definitions that need to be defined.

4 Principle

Tear a rectangular specimen apart from the cut on the short side. Record the force generated during the tearing process and calculate the average value.

5 Instruments and Equipment

5.1

Tensile testing machine, which complies with the following conditions.

---Tensile test range is compatible with the specimen;

---Equipped with a tensile recording device, with an accuracy level of 1.0;

Perform in accordance with the provisions of GB/T 39364. If sampling from a standard location is not possible (e.g., directly from shoes or clothing), specimens shall be taken from any location within the available area; the specimens shall be representative, and this shall be noted in the test report.

6.2 Specimen Preparation

Use a die cutter (5.3) to cut six specimens from the grain surface (if the grain surface cannot be identified, cut from the usable surface). Three of these specimens shall have their long sides parallel to the ridgeline, and the other three specimens shall have their long sides perpendicular to the ridgeline. If the ridgeline direction cannot be identified, respectively take specimens from two mutually perpendicular directions.

If more than two samples from the same batch need to be tested, at least one specimen shall be cut from each sample in each direction, with a total of no less than three specimens in each direction.

6.3 Specimen Conditioning

Perform in accordance with the provisions of QB/T 2707.

6.4 Thickness Determination

Perform in accordance with the provisions of GB/T 45705. The measurement location is the two points between the endpoint A of the cut and the perpendicular distance of the short side (not the direction of the cut) of the specimen.

7 Test Procedures

7.1

Adjust the distance between the fixtures of the tensile testing machine to an appropriate value (e.g., 50 mm) to fix the specimen.

7.2

Fix one side of the specimen cut to one fixture (see Figure 2). Fold the other side of the specimen cut by 180° and fix it to the other fixture, ensuring that the long side of the specimen cut is parallel to the test direction of the tensile testing machine.

7.3 Operate the tensile testing machine, until the specimen tears. Record the force-distance

diagram during the test. If the specimen does not tear along the direction of the cut, re-perform sampling for the test. If the tear still does not occur along the direction of the cut, note this in the test report.

7.4 Repeat steps 7.2 ~ 7.3 to test the remaining specimens.

8.1.1 Calculation method

The tear load of the specimen is the arithmetic mean of the force values on the force-distance diagram and is calculated as follows.

Divide the force-distance diagram from the first peak to the last peak into four equal parts. The first and fourth parts shall not be included in the result calculation. Calculate the average force (i.e., tear load) from the two middle parts and express it in Newtons (N).

If the instrumental calculation method is used, consider all force data points in the two middle parts; this method is recommended for more accurate calculation results.

If the manual calculation method is used, respectively select and record the two highest peaks (maximum values) and the two lowest valleys (minimum values) from the two middle parts (a total of eight values). The peaks or valleys suitable for calculation shall show at least a 10% increase or decrease. Calculate their arithmetic mean. If this method is used, it shall be noted in the test report.

NOTE: different calculation methods use different force data points, so the results of the two calculation methods may differ.

In the event of a dispute or arbitration, the results obtained using the instrumental calculation method for standard-sized specimens shall prevail.

In some cases, the lack of discernible peaks and valleys makes it quite difficult to obtain valid values from the force-distance diagram. In such cases, perform re-sampling for the

test.

8.1.2 Presentation of results

The results are the arithmetic mean of the test results for each specimen in each direction, accurate to 0.1 N.

If necessary (e.g., upon request by the customer), the results may be the arithmetic mean of the test results for all specimens.

8.2 Tear Strength

The tear strength of the specimen is calculated in accordance with Formula (1).

Where,

T---the tear strength, expressed in (N/mm);

F---the tear load, expressed in (N);

t---the specimen thickness, take the arithmetic mean of two measurement points, expressed in (mm).

The result is the arithmetic mean of the test results for each specimen in each direction, accurate to 0.1 N/mm.

If necessary (e.g., upon request by the customer), the result may be the arithmetic mean of the test results for all specimens.

9 Test Report

The test report shall include the following contents.

- a) Serial No. of this document (i.e., GB/T 45711.1);
- b) Detailed information about the sample and any inconsistency with GB/T 39364 in sampling;
- c) If standard-sized specimens are not used, the dimensions of the large-sized specimens used;
- d) If the instrumental calculation method is not used, indicate the manual calculation method used;

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