



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

GB/T 39452-2020

**Leather - Physical and mechanical tests - Tests for adhesion of
finish**

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1 Scope

This Standard specifies the determination method for the adhesion between the leather finishing layer and the leather (or between the finishing layer and the finishing layer).

This Standard applies to tests for adhesion of finish of various types of smooth leather after finishing.

This Standard applies to leather whose coating thickness is not less than 15 μm , as well as film leather.

2 Normative references

The following documents are indispensable for the application of this document.

For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 250, Textiles - Tests for colour fastness - Grey scale for assessing change in colour (GB/T 250-2008, ISO 105-A02:1993, IDT)

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 Principle

Bond the finishing layer of the leather sample to the rigid adhesive board; apply a force to the free end of the leather sample; measure the force that is applied to peel the leather finishing layer from the leather substrate to the specified length, which is the adhesion of finish of the leather.

4.10 Cleaning solvent

N-hexane or a mixture of alkane (such as petroleum ether) that boils in the range of 40°C ~ 80°C, which is used to clean the adhesive board and leather finishing surface before bonding.

4.11 Die cutter

It conforms to the requirements of QB/T 2707; the inner wall is a rectangle whose size is (100+/-2) mm x (10+/-1) mm.

4.12 Soaking device

It is used for soaking the sample; it is only used when the leather needs to be soaked. It contains accessories which are specified below:

- a) Vacuum dryer or other glass container suitable for vacuuming;
- b) Vacuum pump, which can discharge the container [4.12a)] to about 5 kPa (50 mbar) within 4 min;
- c) Beaker, which contains deionized water at about 20 °C, that can completely immerse the test sample (including the adhesive board).

4.13 Gray scale for assessing change in colour

It complies with the requirements of GB/T 250 and is only used when it is necessary to assess the change in the colour of the leather surface before and after the coating is peeled off.

4.14 Deionized water

It shall meet the requirements for Grade-3 water in GB/T 6682.

5.1 Sampling

Perform according to the provisions of GB/T 39364.

Note: The adhesion of finish at different parts of the same piece of leather may be quite different. If these differences need to be considered, it is advisable to take samples from the shoulders and abdomen while sampling according to the provisions of GB/T 39364.

5.2 Preparation of samples

adhesive film; both ends are 15 mm beyond the adhesive board; place the load block (4.9) on the leather sample for at least 2 h; when bonding, pay attention to avoid air bubbles as much as possible.

6.1.2 One-component adhesive bonding

When a one-component adhesive is used, bond the leather sample to the adhesive board according to the following steps:

a) Use a cloth that is dipped in a cleaning solvent (4.10) to clean the surface of the adhesive board (4.2) and the surface of the leather finishing;

Note 1: Use ventilation devices; avoid solvent contact with the skin; wear eye protection.

b) Coat the adhesive (4.7) thinly on the surface of the adhesive board. Apply the glue evenly according to the supplier's instructions. After 1 min, place the sample finishing layer downward on the adhesive; then, place the load block (4.9) on the leather sample for at least 15 min. When bonding, try to avoid bubbles.

Note 2: Avoid contact of liquid cyanoacrylate adhesive with skin.

6.1.3 Treatment of difficult-to-bond samples

For some leather samples, it is difficult to firmly bond it to the surface of the adhesive board (4.2), especially when using polyurethane adhesives. At this time, in order to ensure that the leather finishing layer is firmly adhered to the surface of the adhesive board, fine sandpaper (600 mesh) can be used to lightly sand the leather finishing layer, but it shall be ensured that the adhesive will not penetrate the finishing layer after light sanding.

Note: The leather finishing layer can be polished twice before and after, and then cleaned with a solvent.

In order to avoid the deviation of the test results which is caused by the adhesive bonding on the side of the sample, the use of excessive adhesive shall be avoided. If evidence shows that the adhesive has penetrated from the side of the sample, it shall be re-tested.

6.2.1 Fix the adhesive board support frame (4.3) on the lower fixture of the tensile machine (4.1).

6.2.2 Insert the adhesive board that is adhered with the sample into the support

frame; align the test end with one end of the support frame.

6.2.5 Turn the direction of the sample on the adhesive board support frame;

repeat the test in the opposite direction in accordance with the provisions of 6.2.2 ~ 6.2.4.

Note: The adhesion of finish of the leather may vary with the direction of the hair follicle, the direction of the leather trimming; so, it is necessary to conduct a two-way test on the sample.

6.2.6 Record each force-displacement diagram shown in Figure 6.

Note: If the width of the leather sample does not exceed 10 mm, it shall be indicated in the test report.

6.3 Wet sample test

Place the sample which is bonded according to 6.1 still (place the sample which is bonded by the two-component adhesive for at least 16 h, and the one by the one-component adhesive for at least 1 h); then, soak it through the soaking device (4.12): Completely immerse the sample in a beaker that contains deionized water (4.14) at $(20 \pm 2)^\circ\text{C}$; place the beaker in a vacuum desiccator;

evacuate the desiccator to about 5 kPa in about 4 minutes; maintain the vacuum for about 2 minutes; then, release. After repeating the vacuuming and releasing process at least 2 times, continuously immerse the sample, so that the total time of immersion in water is 30 min ~ 120 min. Take out the sample; use absorbent paper to remove excess deionized water on the surface; then, perform the test in accordance with 6.2.

Note: If the wet test is performed, indicate in the test report the effect of uneven immersion of the leather sample, sample swelling or the influence of water on the adhesive on the result.

7 Result expression

From the force-displacement diagram (see Figure 6), calculate the average value of the force when the coating is peeled off on a sample of about 30 mm long, that is, the adhesion force, which is expressed in N/10mm and is accurate to 0.1 N/10mm. If necessary, according to the provisions of GB/T 250, use the gray scale for assessing change in color (4.13) to assess the change in color of the finishing surface of the sample after the test.

Note 1: Record the force value from the first peak value; when calculating the adhesive force, ignore the 10% peak value before and after it; take the average of all peak and valley values as the adhesive force. If there is no peak value of the force, divide the recorded