



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

GB/T 40920-2021

**Leather - Tests for colour fastness - Colour fastness to cycles
of to-and-fro rubbing**

Issued on: October 11, 2021

Implemented on: May 1, 2022

Issued by: SAMR; SAC

Table of Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Principle	6
5 Instruments and materials	6
6 Sampling and specimen preparation	7
7 Test steps	9
8 Precision	10
9 Test report	10
Annex A (informative) Changes in the structure of this document compared to ISO 11640:2018	11
Annex B (informative) Technical differences between this document and ISO 11640:2018 and their reasons	12

1 Scope

This Standard specifies the test method that uses felts to do cycles of to-and-fro rubbing on the leather surface, so as to determine the color fastness to rubbing on leather surfaces.

This Standard applies to the test of color fastness to cycles of to-and-fro rubbing on various types of leather surfaces.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 250, Textiles - Tests for colour fastness - Grey scale for assessing change in colour (GB/T 250-2008, ISO105-A02:1993, IDT)

GB/T 251, Textiles - Tests for colour fastness - Grey scale for assessing staining (GB/T 251-2008, ISO 105-A03:1993, IDT)

GB/T 6151, Textiles - Tests for colour fastness - General principles of testing (GB/T 6151-2016, ISO 105-A01:2010, MOD)

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

GB/T 24218.2-2009, Textiles - Test methods for nonwovens - Part 2: Determination of thickness (ISO 9073-2:1995, MOD)

GB/T 39364, Leather - Chemical, physical, mechanical and fastness tests - Sampling location (GB/T 39364-2020, ISO2418: 2017, MOD)

QB/T 2464.23, Determination Method for Color Fastness of Leather to Perspiration (QB/T 2464.23-1999, eqv ISO 11641:1993)

QB/T 2707, Leather - Physical and mechanical tests - Sample preparation and conditioning (QB/T 2707-2018, ISO 2419:2012, MOD)

QB/T 2724, Leather - Chemical tests - Determination of pH (QB/T 2724-2018, ISO 4045:2008, MOD)

3 Terms and definitions

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

4 Principle

Under a certain pressure, use a felt that meets the requirements to do the cycles of to-and-fro rubbing on the surface of the leather specimen for a specified number of times.

Use the gray sample card to assess the staining on the felt surface and the discoloration on the leather surface, respectively. Record any other changes and damage visible to the surface of the specimen.

5.1 Color fastness to rubbing tester: mainly includes the components specified in

5.1.1~5.1.3; the ones in 5.1.4 are optional.

5.1.1 Test bench, including the following components:

- a) Horizontal metal platform;
- b) Fixtures: Fix the leather specimen on the platform. The spacing of the fixtures is about 80mm;
- c) Stretching device: The leather sample can be stretched by at least 20% in the rubbing direction.

5.1.2 Test column: The mass is (500 $\pm$ 25)g. It can move or be fixed. It can move freely

in the vertical direction. Main include the following:

- a) Rubbing head: The size is 15mmx15mm;
- b) Felt and rubbing head connecting device: The cavity depth shall be (3.9 ± 0.1) mm;
- c) Weight block: The mass is (500 ± 10) g. After loading, the total mass of the test column is (1000 ± 35) g;
- d) Adjustment device: It can adjust the test column with rubbing head, so that the test column is brought into horizontal contact with the specimen.

5.1.3 Driving device: It can make the test bench to do the to-and-fro movement. The

movement distance is 35mm~40mm. Movement rate (40 ± 2) times/min (record a to-and-fro movement as one time).

test requirements of the test column in all directions of the specimen [see 5.1.4a)].

Typically, only one specimen needs to be tested for each test condition (such as air conditioning of specimen and felt, number of rubs). In case of disputes, take samples from different parts to test separately.

6.3.1 Dry specimens and felts

Conduct air conditioning on dry specimens and felts as specified in QB/T 2707.

6.3.2.1 Boiling method: Put the felt in deionized water (5.5). Heat to boiling. Keep at a

slight boiling until the felt is saturated. Then pour out the hot water. Add cold deionized water. Place still to make the wet felt to cool to room temperature.

6.3.2.2 Vacuum method: Put the felt in a container with deionized water (5.5). Put the

container in the vacuum desiccator (5.3). Vacuum to about 5kPa. Maintain 2min. Then release the pressure back to normal pressure. Repeat this process at least 2 times. Since black felt may fade when boiled, wet black felt is prepared by vacuum method.

6.3.2.3 Before use, remove the felt in 6.3.2.1 or 6.3.2.2 from the water. Reduce moisture

by squeezing or wiping. Make the water absorption of each piece of felt about 1g. The soaking time of the felt in water shall not exceed 24h.

6.3.3 Wet specimens

Immerse the leather specimen in a container containing deionized water (5.5). The specimens must not touch each other. Put the container in the vacuum desiccator (5.3).

Vacuum to about 5kPa. Maintain 2min. Then release the pressure back to normal pressure. Repeat this process at least 2 times. Before use, remove the specimen from the water. Use absorbent paper to dry the leather surface. The soaking time of the specimen in water shall not exceed 1h.

6.3.4 Artificial sweat wet felt

Immerse the felt in a container containing artificial sweat (5.8). Put the container in the vacuum desiccator (5.3). Conduct repeated evacuation and release of pressure to return to normal pressure operation until the felt is submerged. Before use, remove felt from artificial sweat. Reduce artificial sweat content by squeezing or wiping. Make the absorption of each felt to artificial sweat is about 1g. The soaking time of felt in artificial sweat shall not exceed 24h.

NOTE: When performing this procedure, wear suitable gloves to avoid direct contact of the wet felt with the skin.

7.1 Fix the air-conditioned or humidified specimen on the tester. Stretch 10% in the

rubbing direction. If the specimen cannot be stretched by 10%, the stretching degree shall be appropriately reduced or not stretched. If the specimen is still not stable during the rubbing process after being stretched by 10%, continue to fully stretch the specimen until the specimen can remain stable during rubbing. In the latter two cases above, record the tensile condition of the specimen in the test report.

7.2 When testing conventional leather specimens, load the load-bearing block so that

the total mass of the test column is (1000 ± 35) g.

NOTE: For suede, faux suede, leather and fur, due to its own higher friction, during the test, control the total mass of the test column to be (500 ± 25) g.

7.3 Fix the adjusted or wet-conditioned felt on the rubbing head. Make the test column

horizontal contact with the leather specimen. Rub for the specified number of times.

After rubbing, lift the test column to remove it from the leather specimen, especially when rubbing with wet felt.