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

皮革 色牢度试验 往复式摩擦色牢度

(ISO 11640:2018, MOD)

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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 m*ethods (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 access 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 Instruments and materials

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±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 15mm×15mm;

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 Air conditioning of specimens and felts

6.3.1 Dry specimens and felts

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

6.3.2 Wet felts

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 Test steps

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.

7.4 If necessary, replace with new felt. Reselect the number of rubbings. Use the test column to test other parts of the leather specimen (or a new specimen).

7.5 If the felt pills after the test, it shall be re-tested. If the felt is pilled again after the retest, it shall be noted in the test report.

7.6 Take out the specimen and felt. According to the provisions of 7.7, assess the discoloration of the rubbing area and/or the stain of the felt on the specimen, respectively. Wet specimens and felts shall be dried at room temperature prior to assessment.

NOTE 1: For coated leather specimens, before assessing color change, use wool to lightly apply a coat of colorless shoe polish on the leather surface. Similarly, for suede or faux suede (such as velvet or nubuck), use a brush in the direction of the fuzz before assessing.

NOTE 2: A colorless wax emulsion shall be used as shoe polish. In some cases, wax emulsions are not suitable. Use only shoe polishes that contain waxes and organic solvents. If shoe polish is used, state in the test report. Indicate the composition and other details of the shoe polish.

NOTE 3: For white leather or light-colored leather, use black felt for testing if required by customers. Discoloration of the black felt due to friction during the test may cause a slight discoloration of the leather specimen. There is no need to access the color change of the specimen surface at this time. Use white felt to conduct rubbing test on other parts of the specimen before assessment.

7.7 Under D65 light source that is in accordance with GB/T 6151, use gray sample card

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