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Textiles -- Tests for colour fastness to flat abrasion -- Screen wire method

纺织品 耐平磨色牢度试验 金属丝网法

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Textile -- Tests for colour fastness to flat abrasion -- Screen wire method

1 Scope

This document specifies the method for the determination of the color fastness (frosting) of various textiles to flat abrasion by the wire mesh method.

This document is applicable to all kinds of dyed or printed fabrics and their products, especially for fabrics and products with poor dye penetration.

This document does not apply to the sanded, raised, flocked, loose-structured fabrics, and easily damaged fabrics and their products after flat abrasion.

Note: This document introduces a fast way to simulate the gentle frictional movement of fabrics and their products in actual use.

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 250 Textiles -- Tests for colour fastness -- Grey scale for assessing change in colour

GB/T 6529 Textiles -- Standard atmospheres for conditioning and testing

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Frosting

The phenomenon of local lightening of the color of the fabric due to abrasion during use.

Note: Frosting is caused by the different fading ability of fabrics due to abrasion: the coloring ability of various fibers in multi-component blended fabrics is inconsistent, and the fading ability after abrasion is not consistent; frosting in the monofilament fabrics is mainly due to poor dye penetration.

4 Principles

Under the specified load, the sample is repeatedly rubbed with the wire mesh fixed to the flat-grinding test head in multiple directions. Take the original sample as the reference sample, and use the gray sample card to evaluate the discoloration of the sample.

5 Equipment and materials

5.1 Tester for color fastness to flat abrasion

The tester for color fastness to flat abrasion shall meet the following conditions. The schematic diagram of the structure is shown in Figure 1. The flat-grinding test head is located above the reciprocating table:

a) Flat-grinding test head: It consists of a balancing head and an abrasive plate. The abrasive plate can be equipped with stainless-steel wire mesh. The upper surface of the balancing head has a fixed locating pin, which can be vertically loaded with a 0~2.5 kg heavy hammer. One side of the heavy hammer has a groove, and the other side has a fixed locating pin.

b) The reciprocating table consists of a circular sample clamper, a locking ring with an inner diameter of ≥95 mm, a sample plate, and a pawl. Circular sample clamper: The surface has a foam rubber pad with a diameter of (40±1) mm and a hardness of (35±5) HA, and the lower surface of the foam rubber pad is fixed on a cylinder with a diameter of (60±1) mm and a height of (20±1) mm; there shall be a groove on the cylinder, and the lower surface of the cylinder is fixed on a circular plate with a diameter of (110±1) mm. The upper part of the sample plate has a transverse groove and the bottom has a vertical groove.

   See Figure 2 for a schematic diagram of the placement sequence of the locking ring, the circular sample clamper, etc.

c) Driving device: The speed is (115±15) times/min, and the linear motion stroke is (25±1) mm; it can do reciprocating motion. When the pawl drives the sample plate to rotate a circle on its center at a certain speed, the reciprocating table reciprocates 100 times in a straight line.

d) Counter: It displays and records the number of tests, and the result is accurate to 1 time.

5.2 Wire mesh

Stainless steel material, 16 mesh, and wire fineness is (0.23±0.05) mm.

6 Atmosphere for humidity control and test

The atmospheric conditions for humidity adjustment and testing shall be performed according to the standard atmospheric conditions specified in GB/T 6529, and the samples shall be conditioned for at least 4 h.

7 Samples

Cut out 2 circular specimens from the samples after humidity conditioning, and the diameter of each sample is not less than 108 mm.

The specimen shall be representative; the sampling shall avoid obvious defects such as wrinkles and damage; the position of sampling shall be at least 100 mm away from the edge of the cloth.

8 Test steps

8.1 Install the wire mesh on the abrasive plate, and fix both sides of the wire mesh with side clamps. Use tension clamps to fix both ends of the wire mesh; adjust the front tension clamp, so that the wire mesh is flat against the lower surface of the abrasive plate; ensure that the surface of the wire mesh is flat. The warp of the wire mesh shall be parallel to the length of the reciprocating table.

8.2 Place the first sample face up in the middle of the circular sample clamper, and then place the conical sample holder on the sample; put the rubber O-ring into the groove of the circular sample clamper from the conical sample holder; fix the sample, and the surface of the sample shall be flat without deformation; then, remove the conical sample holder.

8.3 Insert the circular sample clamper with the sample into the reciprocating table, and fix the circular sample clamper with the locking ring.

8.4 Install a heavy hammer with a mass of (1135±5) g on the locating pin of the balancing head, and make the pawl in contact with the vertical groove at the bottom of the sample plate. Slowly lower the flat-grinding test head, so that the wire mesh on the abrasive plate is just in parallel contact with the sample on the reciprocating table.

8.5 Set the number of tests to 1200 and start the test.

8.6 After the test, remove the circular sample clamper with the sample, and take out the sample.

During the test, if the sample slips or slides, the test result shall be discarded, and

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