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Textiles-Test method of luminated afterglow property-Luminance meter method

纺织品 夜光余辉性能试验方法 亮度计法

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1 Scope

This document describes the test method for luminated afterglow property of textiles.

This document applies to all kinds of fabrics and their products.

2 Normative references

GB/T 6529

GB/T 8170

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1 luminated afterglow property

The property of textiles to absorb light energy from the environment and store it, and to continue to glow for a certain period of time in a dark environment.

NOTE: The afterglow property of the sample is generally characterized by the afterglow luminance and the afterglow decay time.

3.2 luminance

The intensity of the luminescence on the surface of the textile, that is, the luminous intensity

per unit area.

NOTE: The unit of luminance is candela per square meter (cd/m2).

3.3 illuminance

The luminous flux received per unit area of the illuminated surface.

NOTE: The unit of illuminance is lux (lx).

3.4 saturating excitation

Under the irradiation of the excitation light source, the irradiation time is extended, the state when the change in the luminance of the specimen is within 5 %.

4 Principle

Use the specified light source as the excitation light source, directly illuminate the specimen under the specified illuminance conditions, remove the excitation light source after the specimen is saturated, and measure the afterglow luminance and decay time of the specimen surface with a luminance meter.

5 Instruments and equipment

The textile luminated afterglow property tester is mainly composed of a box, an excitation light source, a luminance meter, an illuminance meter, a sliding door, a control system, etc. (see Figure 1), and shall meet the following requirements:

- Box, with a specimen table, an excitation light source, a luminance meter, an illuminance meter, and a sliding door;

- Excitation light source, a fluorescent lamp, with a color temperature of (6500 ±

500) K, of which the illuminance can be adjusted, and the light output stability every 10 min is better than 1 %; the light source shall illuminate the entire specimen area;

- Luminance meter, with a luminance test range of at least 1 mcd/m2 ~ 10000 mcd/m2, can test the average luminance emitted by the specimen, and the indication error does not exceed ±5 %. The distance between the luminance meter and the specimen shall be determined according to the measurement distance of the luminance meter;

- Illuminance meter, with an illuminance measurement range of at least 10 lx ~ 10000 lx, and an indication error of no more than ±4 %;

- Sliding door, which shall remain sealed and lightproof after closing;

7.3 The specimen is placed in a light-proof container and kept away from light and humidified for at least 24 h under the atmospheric conditions specified in Clause 6.

8 Test steps

8.1 After turning on the excitation light source, adjust the average illuminance at the instrument's specimen table to (1000 ± 10) lx and stabilize it for at least 20 min.

8.2 Place the specimen on the instrument's specimen table with the luminous surface of the specimen facing up, and illuminate the specimen vertically with the excitation light source until the change value of the afterglow luminance of the specimen is within 5 % at least 5 min apart, that is, the specimen reaches the saturating excitation state, and record the saturating excitation time.

8.3 Close the sliding door of the excitation light source, immediately measure the

afterglow luminance of the specimen with a luminance meter, and record the luminance value per minute starting from the 1st minute. When the afterglow luminance of the specimen decays to no more than 10 mcd/m2, stop the test and record the afterglow decay time.

8.4 Test the remaining specimens according to steps 8.2 to 8.3.

9.1 The average afterglow luminance value of the specimens is calculated according to

formula (1). where:

L - the average afterglow luminance value of the specimens, in millicandela per square meter (mcd/m2);

Li - the luminance value at the i-th minute, in millicandela per square meter (mcd/m2);

n - the number of times of measuring the luminance value in the test.

9.2 Calculate the average afterglow luminance value and afterglow decay time of the

three specimens as the afterglow luminance value and afterglow decay time of the sample, and round the results to integers according to GB/T 8170. .....