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

GB/T 16585-1996

**Rubber, vulcanized. Test method of resistance to artificial
weathering (Fluorescent UV lamp)**
(English Translation)

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1 Scope

This Standard specifies an artificial weathering test method that uses fluorescent ultraviolet lamps and condensing devices to simulate natural climate solar ultraviolet light, temperature and condensed water and other aging factors.

This Standard is applicable to the weather resistance test of vulcanized rubber exposed to alternating ultraviolet light and condensation.

2 Normative References

The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. At the time of publication, the editions indicated are valid. All standards are subject to revision. The parties who are using this Standard shall explore the possibility of using the latest version of the following standards.

GB 250-1984 Gray Scale for Assessing Change in Color (idt ISO 105-A02:1984)

GB/T 528-1992 Determination of Tensile Properties of Vulcanized Rubber and Thermoplastic Rubber

GB 730-1986 Blue Wool Standards for Color Fastness to Light and Weathering (idt ISO 105-B:1984)

GB 2941-1991 Standard Temperature, Humidity and Time for Environmental Regulation and Testing of Rubber Samples (eqv ISO 471:1983 ISO 1826:1981)

GB/T 9865.1-1996 Rubber, Vulcanized or Thermoplastic-Preparation of Samples and Test Pieces-Part 1: Physical Tests (idt ISO 4661-1:1986)

GB/T 12831-1991 Rubber, Vulcanized - Test Method of Resistance to Artificial Weathering (Xenon Lamp) (neq ISO 4665-3:1987)

GB/T 14835-1993 Rubber, Vulcanized. Determination of Adhesion to, and Corrosion of Metals (neq ISO 4665-2:1985)

4.4 Blackboard thermometer

The blackboard thermometer is composed of a black aluminum plate of 75mmx10mmx2.5 mm connected with a temperature sensor. It shall be in the range of the exposure center so that it reflects the test temperature as much as possible.

4.5 Instruments and reference materials for measuring radiation

According to conditions and needs, a radiation meter or reference materials may be used to measure the light energy received by the sample.

4.5.1 Radiation meter

Radiation meter includes integrated illuminance meter and radiometer.

4.5.2 Reference materials

The blue wool standard shall comply with the relevant provisions of GB 730; the standard gray scale shall comply with the relevant provisions of GB 250.

5 Specimen

5.1

The specimen preparation shall be in accordance with the relevant provisions of GB/T 9865.

5.2

The shape and specification of the specimen are determined according to the requirements of the evaluation index and the corresponding test standard. Such as testing the tensile properties of the specimen shall be in accordance with GB/T 528 regulations.

5.3

The number of specimens is determined according to the times of test items. Generally, there are no less than 3 valid specimens each time for each test.

5.4

The specimen for measuring the color change shall be in accordance with the provisions of 6.2 of GB/T 12831.

6 Test Conditions

6.1

The test cycle time is generally specified as 4h UV exposure followed by 4h condensation. If necessary, use 8h UV light exposure followed by 4h condensation.

6.2

The UV exposure temperature is generally specified as (50 ± 3) °C. According to the characteristics of the material and the application environment, (60 ± 3) °C or other temperature may be selected.

6.3

The condensing temperature is generally specified as (50 ± 3) °C.

6.4

During the UV exposure period, the equilibrium temperature of the hot air supply test box shall be kept within $\pm 3^\circ\text{C}$.

6.5 During the condensation exposure period, the equilibrium temperature of the hot

water in the selected water tank shall be kept within $\pm 3^\circ\text{C}$.

6.6 The water supplied to the water tank may be distilled water, deionized water or potable tap water.

6.7 The closest distance between the specimen surface and the lamp plane is 50mm and parallel.

6.8 The irradiance in the wavelength range of 280~400nm received by the surface of the specimen is usually no more than 50W/m², and there shall be no radiation below 270nm.

6.9 In order to facilitate inspection and termination of the test, the exposure test time is generally specified as a multiple of 24h, 7d or a multiple of 7d.

7.1 Specimen installation

The specimen is mounted on the specimen holder in a free state, with the exposed surface of the specimen facing the lamp. When the specimen is not filled with the holder, fill the remaining space with blank plates to keep the test conditions in the chamber stable. During

the exposure period, the position of the specimen in the center of the exposed area and the edge of the exposed area shall be changed regularly to reduce uneven exposure.

7.2 Exposure test

Start the test chamber, adjust the specified test conditions; and record the exposure starting time; and keep the specified test conditions constant throughout the exposure period.

7.3.1 Measuring radiation dose by instrument

Regularly place an ultraviolet light integrated illuminometer or radiometer on the side of the exposed specimen holder to directly measure the received ultraviolet radiation dose.

Appendix A (Standard)

Use Method of Measuring the Light Radiation Dose by the Blue Wool Standard

A.1 Instruction

Blue wool standard fabric sample (referred to as "standard sample") is used to assess the grade of color fastness to light and weathering of colored textiles. Because the blue dye is sensitive to light radiation and has a certain quantitative relationship, it may be used to determine the radiation dose level, that is, the exposure period. The blue wool standard sample is divided into eight grades (that is, 8 numbers), which represent 8 light fastness grades. Because the standard sample is easy to use and has a lot of data based on its use, it may be used to determine the exposure period of the rubber light-resistance exposure test.

NOTE: Refer to GB 730 for details.

A.2 Procedure

A.2.1 A set of blue wool standard samples numbered from 1 to 8 (level) are placed adjacent to the specimen and the exposure test is carried out at the same time.

A.2.2 Compare the color difference between the exposed blue wool standard sample

and the unexposed blue wool standard sample, and compare it with the color difference level of the "grey scale for assessing discoloration". When the color difference of the No. 1 standard sample reaches the color difference of Level-4 of the gray scale, then the radiation dose level (exposure level) is 1/1, that is, the exposure period is 1/1. When the color difference of the No. 2 standard sample reaches the same color difference of Level-4, that