ICS 59.080.01
CCS W55

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 18830-2009

Replacing GB/T 18830-2002

Textiles - Evaluation for solar ultraviolet radiation protective properties

纺织品 防紫外线性能的评定

Issued on: June 11, 2009 **Implemented on: January 1, 2010**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;
Standardization Administration of China

Table of Contents

Foreword

The standard replaces GB/T 18830-2002 "Textiles - Evaluation for solar ultraviolet radiation protective properties". As compared with GB/T 18830-2002, the main technical differences are as follows: - MODIFY the Chapter 8 "Calculation and result presentation", ADD the equation (4), (5), and (6); - MODIFY the assessment indicators of UV protection products from "UPF > 30" to "UPF > 40". Appendix A of this standard is a normative appendix. This standard was proposed by the China Textile Industry Association. This standard shall be under the jurisdiction of the National Textile Standardization Technical Committee Basic Standard Branch (SAC/TC 209 /SC 1). The main drafting organizations of this standard. Hangzhou Paradise Umbrella Group Co., Ltd., Textile Industry Standardization Institute. The main drafters of this standard. Xu Lu, Zheng Yuying, Wang Qiwei, He Lingjun, Zhao Chungui. This Standard replaces the standard previously issued as follows: - GB/T 18830-2002. Textiles - Evaluation for solar ultraviolet radiation protective properties

1 Scope

GB/T 18830-2009 is the Chinese national standard on textiles - evaluation for solar ultraviolet radiation protective properties, in the field of textile and leather technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 11 June 2009 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic

of China; Standardization Administration of China, and has been in force since 1 January 2010. Classification: ICS 59.080.01, CCS W55. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the test method for the solar UV radiation protective properties of textiles, as well as the presentation, evaluation and marking of the level of protection. This standard applies to the assessment of the solar UV radiation protective properties of textiles under the specified conditions.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 6529 Textiles - Standard atmospheres for conditioning and testing (GB/T 6529-2008, ISO 139.2005, MOD)

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Solar ultraviolet radiation, UVR It refers to the electromagnetic radiation at a wavelength of 280 nm ~ 400 nm.

3.2 Solar UV-A It refers to the solar ultraviolet radiation at a wavelength of 315 nm ~ 400 nm.

3.3 Solar UV-B It refers to the solar ultraviolet radiation at a wavelength of 280 nm ~ 315 nm.

3.4 Ultraviolet protection factor, UPF It refers to the ratio between the ultraviolet radiation average effect as calculated when the skin is unprotected AND the ultraviolet radiation average effect as calculated when the skin has fabric protection.

3.5 Solar irradiance E (lambda) It refers to the energy per unit area and unit wavelength as received on the Earth from the sun, which is expressed in W - m-2 - nm-

1.The UVR spectrum as measured at the Earth's surface is 290 nm ~ 400 nm.

3.6 Erythema The skin becomes red by a variety of physical or chemical actions.

4 Principles

USE the monochromatic or multicolored UV-rays to collect the total spectral transmittance ray, determine the total spectral transmittance, AND calculate the UV protection factor UPF value of the sample.

5 Instrument

5.1 UV light source PROVIDE the UV radiation at a wavelength of 290 nm ~ 400 nm. Suitable UV light sources include xenon arc lamps, deuterium lamps, and daylight simulators.

5.2 Integrating sphere The total pore area of the integrating sphere does not exceed 10% of the inner surface area of the integrating sphere. The inner surface shall be coated with a highly reflective matte material such as barium sulfate.

5.3 Monochromator It is suitable for the measurement of the spectral bandwidth of 5 nm or less in the wavelength range of 290 nm ~ 400 nm.

5.4 UV transmission filter It only allows the transmission of the light less than 400nm AND there is no fluorescence.

5.5 Test specimen holder It is used to make the test specimen maintain flat in tension-free state OR pre- tensioned state. This device shall not block the entrance of the integrating sphere.

6 Preparation and conditioning of test specimen

6.1 Preparation of test specimens For homogeneous material, it shall take at least 4 representative test specimens AND it shall discard the fabrics within 5 cm to the fabric edge. For nonhomogeneous materials with different color or structure, at least two test specimens shall be tested for each color and each structure.

7 Program

7.1 PLACE the test specimen in front of the entrance of the integrating sphere, and MAKE the fabric side away from the skin when wearing face to the UV light source.

7.3 RECORD the transmittance between 290 nm ~ 400 nm, at least once every 5 nm.

8 Calculation and result presentation

8.1 General USE the equation (1) to calculate the arithmetic average T (UVA) of the UVA transmittance of each test specimen, CALCULATE its mean value T (UVA) AV, and RETAIN two decimal places.

8.2 Homogeneous test specimen USE the equation (4) to calculate the average UV protection factor UPFAV. USE the equation (5) to calculate the standard deviation of UPF.

8.3 Non-homogeneous specimens As for nonhomogeneous materials with different colors or structures, various colors or structures shall be tested, with the lowest UPF value being the UPF of the sample.

9 Assessment and marking

9.1 Assessment If determined in accordance with this standard, if the UPF of the sample > 40 AND T(UVA)AV < 5%, it can be called as "UV protective products".

9.2 Marking UV protective products shall be marked on the label of the following information.

10 Test report

The report shall include the following.