ICS 29.140.01
CCS K 70

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20150-2023

Replacing GB/T 20150-2006

Erythema reference action spectrum and standard erythema dose

Issued on: August 6, 2023 **Implemented on: March 1, 2024**

Issued by: State Administration for Market Regulation, China National Standardization Administration

Table of Contents

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1.Structure and Drafting Rules of Standardization Documents"

Drafting.

This document replaces GB/T 20150-2006 "Erythema Benchmark Response Spectrum and Standard Erythema Dose" and is consistent with GB/T 20150-2006

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

---Changed the terms and definitions of "erythema action spectrum" (see 3.1, 4.1 of the.2006 edition);

---Changed the terms and definitions of "erythema irradiance" (see 3.2, 4.2 of the.2006 edition);

---Changed the terms and definitions of "erythema dose" (see 3.3, 4.3 of the.2006 version);

---Changed the definition of "minimum erythema dose" (see 3.4,.2006 version of 4.4);

---Changed the definition of "standard erythema dose" (see 3.5, 4.5 of the.2006 version);

---Changed the definition of "ultraviolet radiation" (see 3.6, 4.6 of the.2006 edition);

---Changed the formula for erythema dose (see 4.1, 5.1 of the.2006 edition).

This document is equivalent to ISO /CIE17166.2019 "Erythema Benchmark Action Spectrum and Standard Erythema Dose".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

This document is a concise document on the data definition of light and lighting. It is also a basic data source generally accepted and recognized internationally.

Any standard system can be introduced with modifications required.

The problem of dosimetry of skin photobiology is based on the fact that ultraviolet radiation can cause erythema on human skin to a degree similar to

The wavelength has a great relationship. between 250nm and 400nm, the degree spans 4 orders of magnitude. Therefore, it is believed that the ultraviolet radiation received by an individual

The statement that the radiation dose is 1J.cm-2 (104J.m-2) cannot explain the results of radiation expressed as erythema. If the radiation source is purple

If external fluorescent lamps are used, no erythema reaction will occur except for severe abnormal pathological photosensitivity reactions in humans. But by no means

The same dose of radiation from a filtered mercury arc lamp or a fluorescent sun lamp will produce a distinct violet-red color in most people with fair skin.

spot. Therefore, photobiologists have long recognized the need to express this amount of irradiation as an erythema-weighted parameter.

In recent years, the term "minimum erythema dose" (MED) has been widely used as a unit of measure for erythema-causing radiation. due to minimal red

Spot dose is not a standard measurement unit among all measurement units. It has different characteristics of individual sensitivity to ultraviolet radiation, so

This dose of erythema is unreasonable. Variables that influence "minimum erythema dose" include the optical and radiometric properties of the radiation source, the amount of irradiation

factors that determine

location), as well as observational factors (e.g. end point determination, recording of time since irradiation and ambient illumination).

To avoid continued misuse of the term "minimum erythemal dose", it is recommended that this term be reserved only for observational studies in humans and other animals.

term, and adopt the new term "standard erythema dose" (SED) as a standardized unit of measure for erythema-causing ultraviolet radiation.

Erythema reference action spectrum and standard erythema dose

1 Scope

This document specifies the reference action spectrum ser (lambda) and standard erythema dose (SED) that cause skin erythema.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

Edition)

3 Terms and definitions

The terms and definitions defined in CIES017/E.2020 and the following apply to this document.

For the purpose of standardization, ISO and IEC maintain a terminology database at the following address.

3.1

ser(lambda)

A function reflecting the spectral dependence of the ability of ultraviolet radiation (3.6) to produce just appreciable actinic erythema in human skin.

[Source. CIES017/E.2020,17-26-065]

3.2

Erythemalirradiance

The effective irradiance is obtained by spectrally weighting the spectral irradiance Elambda with the erythema spectral weighting function ser(lambda) (3.1), in which the erythema spectrum plus

The weight function ser(lambda) is normalized to 1 at the maximum value.

Note 1.This definition assumes that the actinic effect under consideration adopts an action spectrum with a maximum value of 1.

Note 2.It is necessary to specify which actinic action spectrum is used, because the units of

any action spectrum are the same.

Note 3.Erythema irradiance is expressed in watts per square meter (W.m-2).

[Source. CIES017/E.2020,17-26-067]

3.3

erythema dose erythemaldose

Her

Time integration of erythema irradiance (3.2).