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

GB/T 20147.2-2026

Replacing GB/T 20146-2006

Colorimetry - Part 2: CIE standard illuminants

色度学 第2部分：CIE标准照明体

(English Translation)

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Table of Contents

Preface
Introduction
1 Scope
2 Normative References
3 Terms and Definitions
4 CIE Standard Illuminating Bodies A
5 CIE Standard Illuminating Bodies D65
6 CIE Standard Illuminating Bodies D50
7 Light sources that realize CIE standard illuminants
Appendix A (Informative) Historical Development of the CIE Standard Definition of Illuminating Bodies A
Appendix B (Informative) Table 5. Relative Spectral Power Distribution of CIE Standard Illuminant A
Appendix C (Normative) Table 24. Relative Spectral Power Distribution of CIE Standard Illuminating Bodies D65 and D50
References

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 is Part 2 of GB/T 20147. GB/T 20147 has the following parts published.

---CIE Standard Colorimeter (GB/T 20147-2006);

---Part 2: CIE Standard Illuminating Bodies;

---Part 3: CIE Tristimulation Values;

---Part 4: CIE1976 $L^*a^*b^*$ color space.

This document replaces GB/T 20146-2006 "CIE Standard Illuminating Bodies for Colorimetry". Compared with GB/T 20146-2006, except for the structure...

Aside from adjustments and editorial changes, the main technical changes are as follows.

---The scope has been changed (see Chapter 1, Chapter 1 of GB/T 20146-2006);

---The terminology and definitions section has been revised (see Chapter 3, Chapter 3 of GB/T 20146-2006);

---Added the definition of CIE standard illuminant D50 and correlated color temperature (see Chapter 6);

---Added a light source for the CIE standard illuminant D50 (see 7.2);

---Added the CIE standard illuminator D50 relative spectral power distribution table (see Appendix C).

This document is modified to adopt ISO/CIE 11664-2:2022 "Colorimetry - Part 2: CIE standard illuminants".

This document has undergone the following structural adjustments compared to ISO/CIE 11664-2:2022.

---Appendix A corresponds to Appendix C of ISO/CIE 11664-2:2022;

---Appendix B corresponds to Appendix A of ISO/CIE 11664-2:2022;

---Appendix C corresponds to Appendix B of ISO/CIE 11664-2:2022.

The technical differences between this document and ISO/CIE 11664-2:2022, and the reasons therefor, are as follows.

---CIE S017 has been replaced with the normatively referenced GB/T 2900.65 to adapt to my country's national conditions (see Chapter 3).

The following editorial changes have been made to this document.

---The value has been corrected; "14387.76855" has been changed to "14387.768775" to maintain consistency with the preceding and following text (see 4.2, ISO/CIE).

11664-2:2022 of 4.2).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China National Light Industry Council.

This document is under the jurisdiction of the National Technical Committee on Standardization of Lighting Appliances (SAC/TC224).

Introduction

The illuminators defined in this document are as follows.

a) CIE standard illuminant A.

CIE standard illuminance body A is intended to represent typical tungsten filament

illumination. Its relative spectral power distribution is compared to Planck's power distribution at approximately 2855.5 K.

The relative spectral power distribution of the radiating body is consistent. Unless there is a special reason requiring the use of another illuminating body, in all cases involving incandescent...

In colorimetric applications of lamp lighting, the CIE standard illuminant A is preferred. In photometry, the CIE standard illuminant A is used as...

The basic reference spectrum for calibrating the photometer.

b) CIE standard illuminant D65.

The CIE standard illuminant D65 is intended to represent average daylight with a correlated color temperature of approximately 6500K. Unless there are special reasons requiring its use...

For all colorimetric calculations requiring representative outdoor daylight, the CIE standard illuminant D65 should be used.

As is well known, the relative spectral power distribution of sunlight varies, especially in the ultraviolet spectral region, and these variations depend on the season, the time of day and geographical location. But until more information about these changes is available, CIE standard lighting will still be used.

Body D65.

c) CIE standard illuminant D50.

The CIE standard illuminant D50 is designed to represent daylight with a correlated color temperature of approximately 5000 K. In colorimetric calculations, if this phase is required...

When color temperature is off, it is advisable to use the CIE standard illuminant D50.

This document specifies the CIE standard illuminants A, D65, and D50 in wavelength intervals of 1 nm within the wavelength range of 300 nm to 830 nm.

The relative spectral power distribution value.

The term "illuminator" refers to a defined spectral power distribution that may not necessarily be achieved or provided by an artificial light source. In colorimetry, illumination...

The illuminance body is used to calculate the tristimulus values of the color of an object that reflects or transmits light under specified illumination conditions. The CIE also defines other illuminance bodies, such as the illuminance volume.

C. Other daylight illuminators and illuminators suitable for LEDs and other electric light sources. These illuminators are described in CIE 015, but...

This is not a CIE standard illuminant. It is recommended to choose from the three CIE standard illuminants defined in this document whenever possible, as this will be extremely beneficial.

This facilitates comparison with published results.

In most practical applications of colorimetry, when using CIE standard illuminants A, D65, and D50, a wider range than that specified in this document is adopted.

Wavelength spacing or a narrower spectral range can also meet the requirements. CIE 015 provides data and guidelines supporting this approach, as well as color...

Other practical recommendation processes for degree learning.

The term "light source" refers to a physical object that emits light, such as a lamp or the sun. In some cases, the CIE recommends simulating the CIE's design.

Laboratory light sources with spectral power distribution of illuminants. However, the CIE recommended light sources for CIE illuminants are secondary, because with the advancement of technology...

The exhibition may reveal light sources that more accurately represent specific illuminators or are more suitable for laboratory use.

This document describes the CIE standard light source A used to realize the CIE standard illuminant A. Currently, there is no CIE standard illuminant A.

CIE recommended light sources for D65 and D50.

Based on the provisions of each core system for the elements, GB/T 20147 "Colorimetry" is proposed to be divided into the following 6 parts.

---Part 1: CIE Standard Colorimetric Observer. The purpose is to define two sets of color matching functions in colorimetry.

---Part 2: CIE Standard Illuminants. The purpose is to define the three standard illuminants in colorimetry.

---Part 3: CIE Tristimulus Values. The purpose is to specify the method for calculating the tristimulus values of colors with known spectral distributions.

---Part 4: CIE 1976 $L^*a^*b^*$ color space. The purpose is to define the calculation methods for CIE 1976 $L^*a^*b^*$ color space coordinates.

Methods and two methods for calculating Euclidean color difference in this space.

---Part 5: CIE 1976 $L^*u^*v^*$ color space and u' , v' uniform chromaticity scale diagram. The purpose is to specify the calculation method for CIE 1976.

Methods for using $L^*u^*v^*$ color space coordinates, two methods for calculating Euclidean