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

中华人民共和国国家标准

GB/T 3978-2008

Replace GB/T 3978-1994

Standard illuminants and geometric conditions

标准照明体和几何条件

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China**

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Foreword

This Standard corresponds to the CIE15: 2004 *Colorimetry* and CIE S 005: 1999 *Standard Illuminants Applied to Colorimetry* published by the International Commission on Illumination, and the consistent degree between this Standard and CIE15: 2004 and CIE S 005: 1999 above is non-equivalent. The major difference is the addition of spectral power distribution and chromatic value of illuminant C in table 1, table 2 and table 3.

This Standard is the replacement to GB/T 3978--1994 *Standard Illuminants and Observation Conditions of illumination*.

The main alterations made in this Standard by comparing with GB/T 3978--1994 are as follows:

---the standard English name has been changed into "Standard illuminants and geometric conditions";

---the scope has been changed into "this Standard is applicable to the application and expression of illuminants and geometric conditions in the measurement, calculation and evaluation of colors";

---modify the definitions of illuminants, CIE standard illuminants and CIE light source (see 3.1~3.3 of this Standard); add some other definitions such as geometric conditions, reference plane, sampling aperture and so on (see 3.4~3.10 of this Standard);

---reduce the original 6 types of illuminants in the previous standard to 2 types: A and D 65 (see 4.1 and 4.2 of this Standard);

---add equation (1) for the calculation of the relative spectral power distribution $S_A(\lambda)$ of CIE standard illuminant A, and explain its establishment conditions;

---add calculation methods for chromaticity coordinates and relative spectral power distribution of illuminant D (see 4.3.3 and 4.3.4);

---change "Observation Conditions of illumination" into "geometric conditions"; increase the 4 geometric conditions of reflectance measurement in the original standard to 10 (see 6.1.1~6.1.10 of this Standard); increase the 4 geometric conditions of transmittance measurement in the original standard to 6 (see 6.3.1~6.3.6 of this Standard), modify the expression methods and realization methods of the geometric conditions, and add the

application specification (see 6.2 and 6.4);

----add diffusion: integrating sphere diagram (figure 1) of eight degree geometric conditions and forty-five degree unidirectional/vertical geometric conditions diagram (figure 2);

----Make editorial changes against the original standard according to GB/T 1.1—2000.

This Standard is proposed by and under the jurisdiction of the State Color Standardization Technical Committee.

This Standard is drafted by National Institute of Metrology and Shenzhen Haichuan Limited by Share Ltd.

Main drafters of this Standard: Ma Yu, Lin Yige, Chen Ping, He Weiping, Tang Huigong

The publication conditions of this Standard replacing previous versions:

----GB 3978-1983, GB/T 3978-1994.

Standard illuminants and geometric conditions

1 Scope

This Standard stipulates the CIE standard illuminants in the Colorimetry, the artificial light source representing illuminants and the geometric conditions of color measurement instruments.

This standard is applicable to the application and expression of illuminants and geometric conditions in the measurement, calculation and evaluation of colors.

2 Normative references

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB/T 5698 Glossary of color terms

3 Terms and definitions

The following terms and definitions determined in GB/T 5698 are applicable to this Standard.

3.1

Illuminants

Radiation having definite relative spectral power distribution in the range of wave lengths which influence the color perception.

3.2

CIE standard illuminants

Illuminant A and illuminant D65 defined in CIE according to the relative spectral power distribution.

3.3

CIE sources

The artificial light source stipulated by CIE, its relative spectral power distribution similar to



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