

ICS 37.040.01
CCS G 80



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

GB/T 12823.3-2025

Replacing GB/T 11501-2008

**Photography and graphic technology - Density measurements -
Part 3: Spectral conditions
(English Translation)**

Issued on: August 1, 2025

Implemented on: February 1, 2026

**Issued by: State Administration for Market Regulation, Standardization
Administration of China**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 3 of GB/T 12823 Density Measurement for Photographic and Graphical Techniques.

The following parts have been published.

--- Photographic density measurement Part 1: Geometric and functional symbols (GB/T 12823.1-2008);

--- Photographic density measurement Part 2: Geometric conditions for transmission density (GB/T 11500-2008);

--- Photographic density measurement - Part 4: Geometric conditions for reflection density (GB/T 12823.4-2008).

This document replaces GB/T 11501-2008 "Photographic density measurement Part 3: Spectral conditions" and is in compliance with GB/T 11501-2008.

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

- a) The scope of application of the document has been changed (see Chapter 1, Chapter 1 of the 2008 edition);
- b) Added some terms and definitions (see 3.2, 3.4, 3.6, 3.8, 3.10 to 3.14);
- c) Added relevant content and requirements for "incident spectrum" (see 4.2);
- d) Added the relevant content and methods of "calculation of ISO 5 standard density based

on spectral data" (see 4.5);

e) Added relevant content and requirements on "spectral consistency, repeatability, stability and deviation" (see Chapter 7);

f) Changed the reference table of incident spectrum and spectral product of ISO 5 densitometer (see Table 1 to Table 6, Table 1 to Table 6 of 2008 edition), added the reference table of state density spectrum products (see Table 7) and the reference table of weighting factors (see Tables 8 to 13) were added.

g) Added the relevant content and methods of "Calculation of ISO 5 standard density based on spectral data" (see Appendix A).

This document is modified to adopt ISO 5-3:2009 "Photographic and graphic techniques - Density measurement - Part 3: Spectral conditions".

This document has the following structural adjustments compared to ISO 5-3:2009.

---Appendix A to Appendix D correspond to Appendix B to Appendix E of ISO 5-3:2009;

--- Appendix E corresponds to Appendix A of ISO 5-3:2009.

The technical differences between this document and ISO 5-3:2009 and the reasons for them are as follows.

--- Increased the scope of application (see Chapter 1) to comply with the drafting principles of my country's standardization documents;

--- Changed the relative humidity conditions for sample testing (see 4.6) to adapt to my country's technical conditions and increase operability;

--- Deleted the description of the electronic file. This document provides the calculation method for obtaining the spectrum data with smaller wavelength intervals.

Operability, to facilitate the application of this document.

0.1 Overview

The ISO 5 series consists of four parts that specify the geometric conditions and spectra for optical density determination used in black-and-white and color imaging applications.

The term "ISO 5 standard density" is used in the ISO 5 series to refer to such standards.

When discussing basic optical principles and concepts, "density" is used as a more general term to refer to its traditional meaning.

The complete definition of ISO 5 standard density values requires both the geometrical conditions of the measurement system and its spectral conditions.

ISO 5-4 describes the geometric conditions for ISO 5 standard densities in transmission

and ISO 5 standard densities in reflection, respectively. This document specifies the geometric conditions for ISO 5 standard densities in transmission and reflection.

The spectral conditions for density measurements according to ISO 5 are given. For these conditions, the term "state density" is used to distinguish them.

GB/T 12823 "Measurement of density in photographic and graphic techniques" adopts the ISO 5 series and aims to establish a standard applicable to the field of photographic and graphic techniques.

The criteria for medium density measurement are proposed to consist of four parts.

--- Part 1: Geometric and functional symbols. The purpose is to establish the geometric conditions involved in density measurement and the representation of related functions.

--- Part 2: Geometric conditions for transmission density. The purpose is to establish the geometric conditions for transmission density in density measurement.

--- Part 3: Spectral conditions. The purpose is to establish the spectral related conditions for density measurement.

--- Part 4: Geometric conditions for reflection density. The purpose is to establish the geometric conditions for reflection density in density measurement.

0.2 Density measurement

In photographic applications, optical density is a measure of the modulation of light or radiation flux by an area of a recording medium. Density Measurement it is important in many ways, such as evaluating the brightness and darkness of an image, predicting the performance of film or paper in the printing process, and in color processing.

Density measurement is used in all aspects of image color measurement during processing. If visual effects are important, measure the spectrum.

The conditions need to simulate some suitable lighting and the spectral sensitivity of the human eye. For printing operations, it is necessary to simulate the light source used for printing operations.

Spectral power distribution and spectral sensitivity of printing materials. When evaluating the original material used for color separation reference charts, the spectrum of the light source and the color separation medium the sensitivity and spectral transmittance of the trichromatic filters (and other optical components) also need to be simulated.

In order to provide users with such requirements with measurement data that can be correctly interpreted, it is necessary to provide standard specifications for measurement procedures.

This specification is provided in ISO 5. In this document, a variety of spectral conditions are