INTERNATIONAL STANDARD

ISO 5631-2

Third edition
2015-11-01

Paper and board — Determination of colour by diffuse reflectance —

Part 2: Outdoor daylight conditions (D65/10°)

Papier et carton — Détermination de la couleur par réflectance diffuse —
Partie 2: Conditions de lumière du jour extérieure (D65/10°)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document ISO/TC 6, *Paper, board and pulps*.

This third edition cancels and replaces the second edition (ISO 5631-2:2014). The major change is to allow for calculations using ASTM E308 for instruments that have bandpass correction and still maintain the procedure for instruments without bandpass correction.

ISO 5631 consists of the following parts, under the general title *Paper and board — Determination of colour by diffuse reflectance*:

— *Part 1: Indoor daylight conditions (C/2°)*

— *Part 2: Outdoor daylight conditions (D65/10°)*

— *Part 3: Indoor illumination conditions (D50/2°)*

Introduction

The colour of an object can be uniquely characterized by means of a triplet of colour coordinates such as the CIE *X,Y,Z* tristimulus values or the CIELAB 1976 *L*, a*, b** coordinates, for a specified CIE illuminant and CIE standard observer.

Apart from the optical properties of the sample, the values of such coordinates depend upon the conditions of measurement, particularly the spectral and geometric characteristics of the instrument used. This part of ISO 5631 should therefore be read in conjunction with ISO 2469.

This part of ISO 5631 describes the measurement and description of colour in terms of the CIE standard illuminant D65 and the CIE 1964 (10°) standard observer. The analogous measurement and description of colour in terms of the CIE illuminant C and the CIE 1931 (2°) standard observer are described in ISO 5631-1.

ISO 5631-3 describes the measurement and description of colour in terms of the CIE illuminant D50 and the CIE 1931 (2°) standard observer. This method is especially applicable to comparison of papers in graphic arts situations where the customer wishes to make measurements under these illuminant/observer conditions required by ISO 13655. The choice of illuminant conditions is important when determining the colour coordinates of white papers containing a fluorescent whitening agent. In ISO 5631-1, the UV content of the illumination is lower than those specified in this part of ISO 5631, approximating UV levels encountered in indoor rather than outdoor viewing conditions.

Paper and board — Determination of colour by diffuse reflectance —

Part 2: Outdoor daylight conditions (D65/10°)

1 Scope

This part of ISO 5631 specifies a method for measuring the colour of paper and board by the diffuse reflectance method with the elimination of specular gloss.

It can be used to determine the colour of papers or boards that contain fluorescent whitening agents, provided the UV content of the illumination on the test piece has been previously adjusted to give the calibrated colourimetric value corresponding to CIE standard illuminant D65, using a fluorescent reference standard with an assigned CIE whiteness (D65/10°) value provided by an authorized laboratory, as described in ISO 11475.

This part of ISO 5631 is not applicable to coloured papers or boards that incorporate fluorescent dyes or pigments.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 186, *Paper and board — Sampling to determine average quality*

ISO 2469, *Paper, board and pulps — Measurement of diffuse radiance factor (diffuse reflectance factor)*

ISO 11475:2004, *Paper and board — Determination of CIE whiteness, D65/10° (outdoor daylight)*

ASTM E308, *Standard Practice for Computing the Colors of Objects by Using the CIE System*

CIE Publication 15:2004, *Colorimetry*, 3rd ed

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
radiance factor
β
ratio of the radiance of a surface element of a body in the direction delimited by a given cone, with its apex at the surface element, to that of the perfect reflecting diffuser under the same conditions of illumination

Note 1 to entry: For fluorescent (luminescent) materials, the total radiance factor, β, is the sum of two portions, the reflected radiance factor, β_R, and the luminescent radiance factor, β_L, so that $\beta = \beta_R + \beta_L$.

For non-fluorescent materials, the reflected radiance factor, β_R, is numerically equal to the reflectance factor, R.