AS/NZS 1301.535:2016
ISO 5631-2:2015

AS/NZS 1301.535:2016

Australian/New Zealand Standard™

Methods of test for pulp and paper—Determination of colour by diffuse reflectance

Method 535: Outdoor daylight conditions (D65/10°)

STANDARDS Australia

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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PK-019, Methods of Test for Pulp and Paper. It was approved on behalf of the Council of Standards Australia on 6 December 2016 and by the New Zealand Standards Approval Board on 9 December 2016.
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The following are represented on Committee PK-019:

Appita
Australian Forest Products Association
Monash University
New Zealand Paper Forum
Scion

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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

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Method 535: Outdoor daylight conditions (D65/10°)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PK-019, Methods of Test for Pulp and Paper to supersede AS/NZS 1301.455:2014, *Methods of test for pulp and paper—Determination of colour by diffuse reflactance—Outdoor daylight conditions (D65/10°)*.

The objective of this Standard is to provide a method for determining the colour of paper and board by diffuse reflectance under outdoor daylight conditions (65/10°).

This Standard is identical with, and has been reproduced from ISO 5631-2:2015, *Paper and board—Determination of colour by diffuse reflectance*—Part 2: *Outdoor daylight conditions (D65/10°)*.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text 'this part of ISO 5631' should read 'this Australian/New Zealand Standard'.

(c) A full point substitutes for a comma when referring to a decimal number.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS/NZS 1301	Methods of test for pulp and paper
186	Paper and board—Sampling to determine average quality		Method 417s: Sampling to determine average quality
2469	Paper, board and pulps—Measurement of diffuse radiance factor (diffuse reflectance factor)		Method 510: Measurement of diffuse radiance factor (diffuse reflectance factor)

The reference ISO 187 has not been adopted as an Australian/New Zealand Standard.

In Australia and New Zealand the following Standards are generally used:

AS/NZS 1301	Methods of test for pulp and paper
1301.414s:2006	Method 414s: Conditioning of paper for testing
1301.415s:2008	Method 415s: Standard atmosphere for testing paper and board and procedure for monitoring the atmosphere

Only normative references that have been adopted as Australian or Australian/New Zealand Standard have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

CONTENTS

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.

AUSTRALIAN/NEW ZEALAND STANDARD

Methods of test for pulp and paper—Determination of colour by diffuse reflectance

Method 535: 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.