



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 12625-16:2013**  
**01-december-2013**

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**Tissue papir in proizvodi iz tissue papirja - 16. del: Določevanje optičnih lastnosti - Opaciteta (papirna podlaga) - Metoda razpršene odsevnosti (ISO/DIS 12625-16:2013)**

Tissue paper and tissue products - Part 16: Determination of optical properties - Opacity (paper backing) - Diffuse reflectance method (ISO/DIS 12625-16:2013)

Tissue-Papier und Tissue-Produkte - Teil 16: Bestimmung der optischen Eigenschaften - Opazität über Papierstapel - Diffuser Reflexionsfaktor (ISO/DIS 12625-16:2013)

Papier tissue et produits tissues - Partie 16: Détermination des propriétés optiques - Opacité sur fond papier - Méthode par réflexion en lumière diffuse (ISO/DIS 12625-16:2013)

**Ta slovenski standard je istoveten z: prEN ISO 12625-16**

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**ICS:**

85.080.20      Tissue papir                                      Tissue paper

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# DRAFT INTERNATIONAL STANDARD

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### Tissue paper and tissue products —

#### Part 16:

### Determination of optical properties — Opacity (paper backing) — Diffuse reflectance method

*Papier tissue et produits tissues —*

*Partie 16: Détermination des propriétés optiques — Opacité sur fond papier — Méthode par réflexion en lumière diffuse*

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#### ISO/CEN PARALLEL PROCESSING

This draft has been developed within the European Committee for Standardization (CEN), and processed under the **CEN lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 12625-16 was prepared by European Committee for Standardisation (CEN) Technical Committee CEN/TC 172 *Pulp, paper and board*, in collaboration with Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods for quality specifications for paper and board*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

- *Part 1: General guidance on terms;*
- *Part 3: Determination of thickness, bulking thickness, apparent bulk density and bulk;*
- *Part 4: Determination of tensile strength, stretch at break and tensile energy absorption;*
- *Part 5: Determination of wet tensile strength;*
- *Part 6: Determination of grammage;*
- *Part 7: Determination of optical properties — Measurement of brightness and colour with D65/10° (outdoor daylight);*
- *Part 8: Water-absorption time and water-absorption capacity; basket-immersion test method;*
- *Part 9: Determination of ball burst strength;*
- *Part 11: Determination of wet ball burst strength;*
- *Part 12: Determination of tensile strength of perforated lines — Calculation of perforation efficiency;*
- *Part 15: Determination of optical properties — Measurement of brightness and colour with C/2° (indoor daylight);*
- *Part 16: Determination of optical properties — Opacity (paper backing) — Diffuse reflectance method*

## Introduction

Optical measurements are affected by the geometry of the instruments used and by the texture of the material. The design of the instrument to be used according to this part of ISO 12625, and the routine to be adopted for its calibration is specified in ISO 2469.

The optical properties are related to the visual appearance of the material. Therefore, although optical properties are intrinsic properties of tissue paper, they are not functional properties.

The opacity value depends on the principle used for its evaluation, and a method should be chosen which most closely relates to the interpretation to be placed upon the results. The method described in this International Standard is applicable when it is desired to measure that property of a tissue paper or tissue product which governs the extent to which one sheet visually obscures printed matter on underlying sheets of similar tissue paper or tissue product. It should not be confused with methods based on the reduction in a standard contrast by interposition of the paper opacity (white backing), formerly known as contrast ratio, nor with the assessment of the amount and condition of light penetrating a sheet (transparency or translucency).

The calculation of opacity requires luminance-factor data obtained by measurement under specified conditions. The luminance factor depends on the conditions of measurement, and particularly on the spectral and geometric characteristics of the instrument used for its determination. This International Standard should therefore be read in conjunction with ISO 2469.

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# Tissue paper and tissue products — Part 16: Determination of optical properties - Opacity (paper backing) - Diffuse reflectance method

## 1 Scope

This part of ISO 12625 specifies testing procedures for the instrumental determination of opacity paper backing of tissue paper and tissue products by diffuse reflectance.

This part of ISO 12625 also gives specific instructions for the preparation of test pieces (single-ply, multi-ply products), where special precautions may be necessary.

It can be used to determine the opacity of tissue paper and tissue products which contain fluorescent whitening agents, provided the UV content of the radiation incident on the test piece has been adjusted to conform to that in the CIE illuminant C using a fluorescent reference standard provided by an ISO/TC 6 authorized laboratory as described in ISO 2470-1.

This International Standard is not applicable to coloured tissue paper and tissue products which incorporate fluorescent dyes or pigments.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. 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 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

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

ISO 2470-1:2008, *Paper, board and pulps — Measurement of diffuse blue reflectance factor — Part 1: Indoor daylight conditions (ISO brightness)*

ISO 2471, *Paper and board — Determination of opacity (paper backing) — Diffuse reflectance method*

ISO/FDIS 12625-7, *Tissue paper and tissue products — Part 7: Determination of optical properties — Brightness and colour with D65/10° (outdoor daylight)*

## 3 Terms and definitions

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

## ISO/DIS 12625-16

**3.1**  
**reflectance factor**  
 $R$   
 ration of the radiation reflected by a surface element of a body in the direction delimited by a given cone with its apex at the surface element to that reflected by the perfect reflecting diffuser under the same conditions of irradiation

NOTE 1 to entry [Source ISO 2471:2008].

NOTE 2 to entry The ratio is often expressed as a percentage.

NOTE 3 to entry The reflectance factor is influenced by the backing if the body is translucent.

**3.2**  
**luminance factor (C)**  
*luminous reflectance factor*  
 $Y(C/2^\circ)$ -value  
 $R_y$   
 reflectance factor or radiance factor defined with reference to the CIE illuminant C and the visual efficiency function ( $\lambda$ )

NOTE 1 to entry The visual efficiency function describes the sensitivity of the eye to light, so that the luminance factor (C) corresponds to the attribute of visual perception of the reflecting surface.

NOTE 2 to entry For computational purposes, the function is identical with the CIE 1931 colour-matching function  $\bar{y}(\lambda)$ .

NOTE 3 to entry The luminance factor (C) is also known as the  $Y(C/2^\circ)$ -value. In previous editions of this International Standard it was referred to as the luminous reflectance factor.

NOTE 4 to entry [Source ISO 2471:2008]. <https://standards.iteh.ai/catalog/standards/sist/fae298e8-dc58-47c6-8638-29176e8903a5/sist-en-iso-12625-16-2015>

**3.3**  
**single-sheet luminance factor (C)**  
 $R_0$   
 luminance factor (C) of a single sheet of paper with a black cavity as backing

NOTE 1 to entry [Source ISO 2471:2008].

**3.4**  
**intrinsic luminance factor (C)**  
 $R_\infty$   
 luminance factor (C) of a layer or pad of material thick enough to be opaque, i.e. such that increasing the thickness of the pad by doubling the number of sheets results in no change in the measured reflectance factor

NOTE 1 to entry [Source ISO 2471:2008].

**3.5**  
**opacity (paper backing)**  
 ratio of the single-sheet luminance factor (C),  $R_0$ , to the intrinsic luminance factor (C),  $R_\infty$ , of the same sample

NOTE 1 to entry Opacity is expressed as a percentage.

NOTE 2 to entry [Source ISO 2471:2008].

## 4 Principle

The luminance factor of a single sheet of the tissue paper or tissue product over a black cavity and the intrinsic luminance factor of the tissue paper or tissue product are determined. The opacity is calculated as the ratio of these two luminance factor values.

## 5 Apparatus

### 5.1 Reflectometer

**5.1.1 Reflectometer**, having the geometric, spectral and photometric characteristics described in ISO 2469, calibrated in accordance with the provisions of ISO 2469 and equipped for the measurement of luminance factor (C).

Because materials to be measured may contain fluorescent whitening agents, the reflectometer shall be equipped with a radiation source having an adequate UV content control adjusted to a UV condition corresponding to the C illuminant by the use of a reference standard, as described in ISO 2470-1.

**5.1.2** In the case of a **filter reflectometer**, a **filter** that, in conjunction with the optical characteristics of the basic instrument, gives an overall response equivalent to the CIE tristimulus value Y of the CIE 1931 standard colorimetric system of the test piece evaluated for the CIE illuminant C.

**5.1.3** In the case of an **abridged spectrophotometer**, a **function** that permits calculation of the CIE tristimulus value Y of the CIE 1931 standard colorimetric system of the test piece, evaluated for the CIE illuminant C using the weighting functions given in Annex A.

### 5.2 Reference standards

for calibration of the instrument and the working standards, used often enough to ensure satisfactory calibration and UV adjustment.

**5.2.1 Non-fluorescent reference standard**, for photometric calibration, issued by an ISO/TC 6 authorized laboratory in accordance with the provisions of ISO 2469.

**5.2.2 Fluorescent reference standard**, for use in adjusting the UV content of the radiation incident upon the sample in order to adjust the UV setting of the instrument to conform to UV(C) conditions, as described in ISO 2470-1.

### 5.3 Working standards

**5.3.1 Two plates**, of flat opal glass, ceramic or other suitable material, cleaned and calibrated as described in ISO 2469.

NOTE In some instruments, the function of the primary working standard can be fulfilled by a built-in internal standard.

### 5.4 Black cavity

having a reflectance factor which does not differ from its nominal value by more than 0,2 %, at all wavelengths. The black cavity should be stored upside down in a dust-free environment or with a protective cover.

NOTE 1 The condition of the black cavity can be checked by reference to the instrument manufacturer.

NOTE 2 The nominal value is given by the manufacturer.