SLOVENSKI STANDARD

SIST EN ISO 13468-2:2006

01-julij-2006

Polimerni materiali - Ugotavljanje celotne prepustnosti svetlobe prozornih materialov – 2. del: Instrument z dvojnim žarkom (ISO 13468-2:1999)

Plastics - Determination of the total luminous transmittance of transparent materials - Part 2: Double-beam instrument (ISO 13468-2:1999)

Kunststoffe - Bestimmung des totalen Lichttransmissionsgrades von transparenten Materialien - Teil 2: Zweistrahlinstrument (ISO 13468-2:1999)

Plastiques - Détermination du facteur de transmission du flux lumineux total des matériaux transparents - Partie 2: Instrument a double faisceau (ISO 13468-2:1999)

Ta slovenski standard je istoveten z: EN ISO 13468-2:2006

ICS:

83.080.01

SIST EN ISO 13468-2:2006 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13468-2

April 2006

ICS 83.080.01

English Version

Plastics - Determination of the total luminous transmittance of transparent materials - Part 2: Double-beam instrument (ISO 13468-2:1999)

Plastiques - Détermination du facteur de transmission du flux lumineux total des matériaux transparents - Partie 2: Instrument à double faisceau (ISO 13468-2:1999)

Kunststoffe - Bestimmung des totalen Lichttransmissionsgrades von transparenten Materialien - Teil 2: Zweistrahlinstrument (ISO 13468-2:1999)

This European Standard was approved by CEN on 16 March 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN ISO 13468-2:2006: E

Foreword

The text of ISO 13468-2:1999 has been prepared by Technical Committee ISO/TC 61 "Plastics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 13468-2:2006 by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 13468-2:1999 has been approved by CEN as EN ISO 13468-2:2006 without any modifications.

INTERNATIONAL STANDARD

ISO 13468-2

First edition
1999-05-01

Plastics — Determination of the total luminous transmittance of transparent materials —

Part 2:

Double-beam instrument

Plastiques — Détermination du facteur de transmission du flux lumineux total des matériaux transparents —

Partie 2: Instrument à double faisceau

Reference number
ISO 13468-2:1999(E)

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 3.

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.

International Standard ISO 13468-2 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

ISO 13468 consists of the following parts, under the general title *Plastics — Determination of the total luminous transmittance of transparent materials*:

— *Part 1: Single-beam instrument*

— *Part 2: Double-beam instrument*

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Plastics — Determination of the total luminous transmittance of transparent materials —

Part 2:
Double-beam instrument

1 Scope

This part of ISO 13468 covers the determination of the total luminous transmittance, in the visible region of the spectrum, of planar transparent and substantially colourless plastics, using a double-beam scanning spectrophotometer. This part of ISO 13468 cannot be used for plastics which contain fluorescent materials.

This part of ISO 13468 is applicable to transparent moulding materials, films and sheets not exceeding 10 mm in thickness.

NOTE 1 Total luminous transmittance can also be determined by a single-beam instrument as in part 1 of this International Standard.

NOTE 2 Substantially colourless plastics include those which are faintly tinted.

NOTE 3 Specimens more than 10 mm thick may be measured provided the instrument can accommodate them, but the results may not be comparable with those obtained using specimens less than 10 mm thick.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 13468. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13468 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 291:1997, *Plastics — Standard atmospheres for conditioning and testing.*

ISO 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions.*

ISO 5725-2:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.*

ISO 5725-3:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 3: Intermediate measures of the precision of a standard measurement method.*

ISO/CIE 10526:1999, *CIE standard illuminants for colorimetry.*

ISO/CIE 10527:1991, *CIE standard colorimetric observers.*

CIE Publication No. 15.2:1986, *Colorimetry.*

CIE Publication No. 17.4:1987, *International lighting vocabulary* [also published as IEC 50(845):1987, *International electrotechnical vocabulary — Chapter 845: Lighting*].

3 Terms and definitions

For the purposes of this part of ISO 13468, the terms and definitions given in CIE Publication No. 17.4 for "transparent medium", "transmittance", "regular transmittance", "radiant flux" and "luminous flux" apply, together with the following:

3.1
transparent plastics
plastics in which the transmission of light is essentially regular and which have a high transmittance in the visible region of the spectrum

NOTE Provided their geometrical shape is suitable, objects will be seen distinctly through plastic which is transparent in the visible region.

3.2
total spectral transmittance
the ratio of the transmitted radiant flux (regular and diffuse) to the incident radiant flux when a parallel beam of monochromatic radiation of a given wavelength passes through a specimen

3.3
total luminous transmittance

the ratio of the transmitted luminous flux to the incident luminous flux when a parallel beam of light passes through a specimen

4 Apparatus

4.1 The apparatus shall consist of the following elements:

— a stabilized light source;

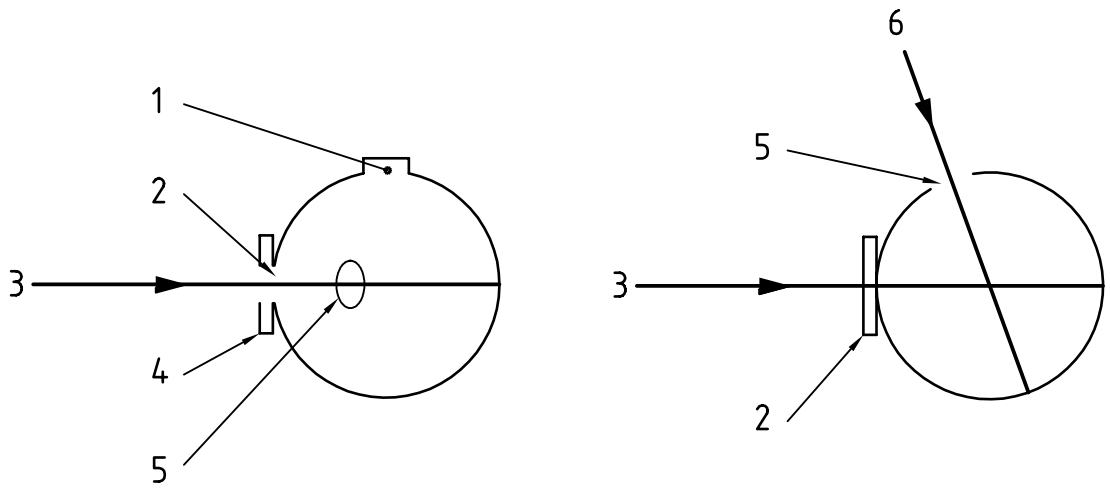
— a monochromator;

— an optical system that forms two parallel beams of monochromatic radiation of equal wavelength λ and approximately equal radiant flux from the output of the monochromator (called the sample and the reference beam);

— and an integrating sphere fitted with ports and a photodetector.

The sample beam enters the sphere through the entrance port. The reference beam enters the sphere through the reference port. The photodetector is mounted on the photodetector port in a manner that allows it to view with equal efficiency all parts of the sphere. Ingress of external light into the integrating sphere shall be prevented. A schematic arrangement of the integrating sphere is shown in Figure 1.

4.2 The value of the total luminous transmittance determined by the instrument shall be accurate to ± 1,0 %. To fulfill this requirement, the response of the photodetector must be sufficiently linear in the visible region of the spectrum and the spectral bandwidth at half power of the monochromator must be sufficiently small. The measurement conditions shall be such that the specimen temperature does not increase while measurements are made.



Key

1 Photodetector
2 Entrance port
3 Sample beam
4 Specimen holder
5 Reference port
6 Reference beam

a) Side view **b) Top view**

Figure 1 — Schematic arrangement of the integrating sphere (baffles not shown)

4.3 The optical system shall produce two parallel beams; the angle which any ray of either of these beams makes with the axis of the beam shall not exceed 0,087 rad (5°). The beams shall not be vignetted at either port of the sphere.

The diameter of each beam shall be 0,5 to 0,8 times the diameter of its respective port.

4.4 Using this instrument, the repeatability standard deviation shall be 0,2 % or less. The within-laboratory reproducibility over long time intervals shall not exceed the repeatability by a factor of more than 3.

4.5 The design of the instrument shall be such that the total spectral transmittance is zero when the radiant flux incident on the specimen is zero.

4.6 The integrating sphere may be of any diameter as long as the total port area does not exceed 3,0 % of the internal area of the sphere.

NOTE 1 It is recommended that the diameter of the integrating sphere is not less than 150 mm so that specimens of a reasonable size can be used.

NOTE 2 When the diameter of the integrating sphere is 150 mm and the diameters of the entrance, reference and photodetector ports are 30 mm, the ratio of the total port area to the internal area of the sphere is 3,0 %.

4.7 The entrance and reference ports of the integrating sphere shall be circular and of the same size (see the note below). The angle between the straight line defined by the centre of the entrance port and the centre of the sphere and the straight line defined by the centre of the reference port and the centre of the sphere shall be less than or equal to 90°. The angle between each of these straight lines and the straight line defined by the centre of the photodetector port and the centre of the sphere shall be 90°.