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# Plastics — Determination of haze for transparent materials

*Plastiques — Détermination du trouble des matériaux transparents*



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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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.



This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 14782:1999), which has been technically revised. It also incorporates the Technical Corrigendum ISO 14782:1999/Cor 1:2005.



The main changes compared to the previous edition are as follows:

— Formula (1) in Clause 9 has been corrected;

— the document has been editorially revised.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

# Plastics — Determination of haze for transparent materials

## 1 Scope

This document specifies a method for the measurement of haze, an optical property resulting from wide-angle scattering of light, in transparent and substantially colourless plastics. This method is applicable to the measurement of haze values of less than 40 %.

NOTE The haze of abraded or matted transparent plastics can be measured, but the value obtained can be erroneously lower than the true value due to light scattering within a narrow angle.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 472, *Plastics — Vocabulary*

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

ISO/CIE 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

ISO 11664-2, *Colorimetry — Part 2: CIE standard illuminants*

ISO 13468-1, *Plastics — Determination of the total luminous transmittance of transparent materials — Part 1: Single-beam instrument*

CIE Publication No. 15, *Colorimetry*



## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and ISO 13468-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

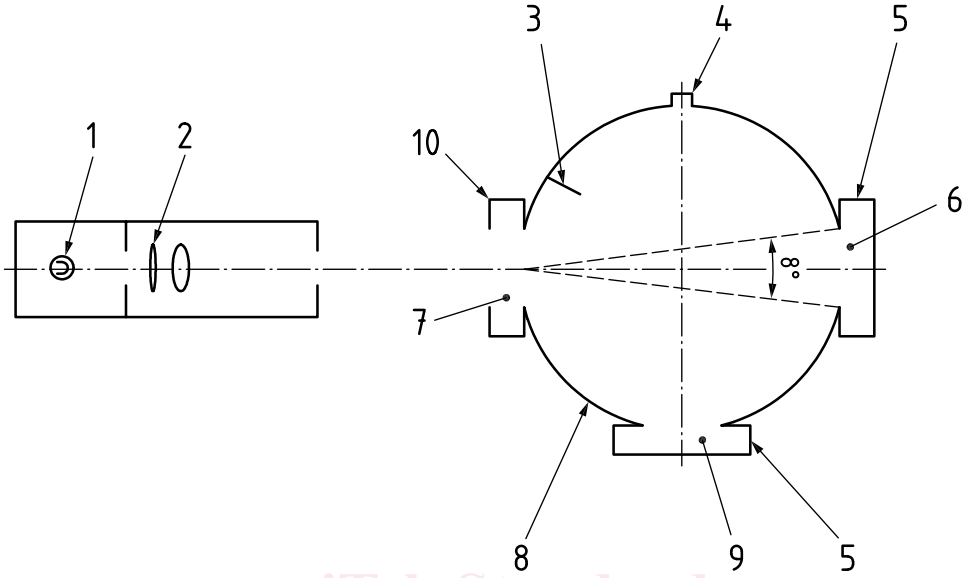
— IEC Electropedia: available at https://www.electropedia.org/

## 4 Principle

Haze is determined using an integrating sphere the efficiency of which is held constant by compensation.

## 5 Apparatus

**5.1** The apparatus shall consist of a stabilized light source, an associated optical system, an integrating sphere with ports, and a photometer comprising a photodetector, signal processor and display unit or recorder (see Figure 1).




**Key**

| | | | |
|---|---|---|---|
| 1 | lamp | 6 | exit port |
| 2 | lens | 7 | entrance port |
| 3 | baffle | 8 | integrating sphere |
| 4 | photodetector | 9 | compensation port |
| 5 | light trap | 10 | specimen holder |



**Figure 1 — Schematic arrangement of the apparatus**

**5.2** The light source and the photometer shall be used in conjunction with a filter to provide an output corresponding to the photopic standard luminous efficiency $V(\ddot{e})$ (as defined in ISO/CIE 11664-1), which is identical to the colour-matching function $\bar{y}(\ddot{e})$ specified in ISO/CIE 11664-1 under CIE standard illuminant $D_{65}$ as specified in ISO 11664-2. The output of the photodetector shall be proportional to the incident flux, to within 1 % of the incident flux, over the range used.

The spectral and photometric characteristics of the light source and photometer shall be kept constant during measurements.

**5.3** The light source and its associated optical system shall produce a parallel light beam, no ray of which makes an angle of more than 0,05 rad (3°) with the beam axis. This beam shall not be vignetted at either port of the integrating sphere.

**5.4** The design of the instrument shall be such that the reading is zero in the absence of the light beam.

**5.5** The integrating sphere used to collect the transmitted light may be of any diameter (but preferably no less than 150 mm in order to be able to accommodate large specimens), as long as the total port area does not exceed 3,0 % of the internal reflecting area of the sphere.