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Road vehicles — Safety glazing materials — Method for the determination of solar transmittance

Véhicules routiers — Vitrages de sécurité — Méthode de détermination du facteur de transmission du rayonnement solaire

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Contents

Page

Foreword ..... **iv**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Terms, definitions and symbols **1**
3.1 Terms and definitions 1
3.2 Symbols 1
4 Apparatus **2**
5 Procedure **2**
5.1 Sample preparation 2
5.2 Measurement 3
5.3 Calculation method 3
5.3.1 Luminous transmittance [T_L] 3
5.3.2 Solar UV transmittance [$T_{UV(380)}$] 3
5.3.3 Solar UV transmittance [$T_{UV(400)}$] 3
5.3.4 Solar direct transmittance [T_e] 3
5.3.5 Solar direct reflectance [R_e] 3
5.3.6 Solar direct absorbance [a_e] 4
5.3.7 Total solar transmittance [T_{TS}] 4
5.3.8 Colorimetry 5
6 Expression of results **6**
Annex A (informative) **Derivation of solar weight table** **10**
Bibliography **12**

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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.

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 22, *Road vehicles*, Subcommittee SC 35, *Lighting and visibility*.

This second edition cancels and replaces the first edition (ISO 13837:2008), which has been technically revised.

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

— deletion of definitions of convention “A” and convention “B”;

— deletion of all texts and tables corresponding to air mass 1,0 global;

— revision of 3.1;

— addition of some symbol definitions for variables and parameters;

— addition of calculation methods for luminous transmittance [T_L], solar direct reflectance [R_e], solar direct absorbance [a_e] and colorimetry;

— revision of calculation method for solar UV transmittance $\left[T_{UV(380)}\right]$ to calculate with air mass 1,5 global;

— addition of a new Table 1 for calculation of luminous transmittance [T_L], a new Table 2 for calculation of solar UV transmittance [$T_{UV(380)}$], and a new Table 5 for calculation of colorimetry;

— revision of Table 3 (former Table 1) for calculation of solar UV transmittance [$T_{UV(400)}$], Table 4 (former Table 2) for calculation of solar direct transmittance [T_e], solar direct reflectance [R_e], and Table A.1 for explanation of the derivation process;

— revision of Annex A to list the source of values in the new solar weight tables and give out the derivation process of Table 3 as an example;

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— deletion of Figure A.1 and Figure A.2;

— moving of texts of Annex B to 5.3.7 and revision of text structure;

— revision of Bibliography;

— editorial update.

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.

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Introduction

A review of existing standards and industry specifications and procedures reveals a lack of agreement with respect to the basis for defining and measuring the ultraviolet (UV), visible (VIS), infrared (IR) transmittance and colorimetry (L^*, a^*, b^*) properties of glazing materials. To avoid the continued preparation and promulgation of conflicting standards by individual entities, there is an interest in the automotive and glazing industries to harmonize on a worldwide basis the test procedures and protocols used to assess the solar transmittance properties of glazing materials.

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Road vehicles — Safety glazing materials — Method for the determination of solar transmittance

1 Scope

This document specifies test methods to determine the luminous, the direct and total solar transmittance, and the colorimetry of safety glazing materials for road vehicles.

This document applies to monolithic or laminated, clear or tinted samples of safety glazing materials. Essentially flat sections of glazing parts can be used in this test, as well as flat samples of the same materials.

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/CIE 11664-4:2019, *Colorimetry — Part 4: CIE 1976 L*a*b* colour space*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

ISO and IEC maintain terminology 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/

3.1.1
air mass
ratio of the mass of atmosphere in the actual observer-sun path to the mass that would exist if the observer were at sea level, at standard barometric pressure, and the sun were directly overhead

3.2 Symbols

T_{L}	luminous transmittance for CIE standard illuminant A with 2 degree view through a glazing
T_{λ}	transmittance through a glazing at wavelength λ within a specified $\Delta\lambda$
W_{λ}	normalized luminous transmittance weighting coefficient
$T_{\mathrm{UV}(380)}$	ultraviolet (UV) direct solar energy transmitted through the glazing at a specified upper limit value (380 nm)
$E'_{\lambda(\mathrm{n})}$	normalized relative spectral distribution of global solar radiation
$T_{\mathrm{UV}(400)}$	ultraviolet (UV) direct solar energy transmitted through the glazing at a specified upper limit value (400 nm)

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