SLOVENSKI STANDARD
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Steklo v gradbeništvu - Lepljeno steklo in lepljeno varnostno steklo - 2. del: Lepljeno varnostno steklo (ISO/DIS 12543-2:2020)

Glass in building - Laminated glass and laminated safety glass - Part 2: Laminated safety glass (ISO/DIS 12543-2:2020)

Glas im Bauwesen - Verbundglas und Verbund-Sicherheitsglas - Teil 2: Verbund-Sicherheitsglas (ISO/DIS 12543-2:2020)

Verre dans la construction - Verre feuilleté et verre feuilleté de sécurité - Partie 2: Verre feuilleté de sécurité (ISO/DIS 12543-2:2020)

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Glass in building — Laminated glass and laminated safety glass —

Part 2: Laminated safety glass

Verre dans la construction — Verre feuilleté et verre feuilleté de sécurité —

Partie 2: Verre feuilleté de sécurité

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 160, *Glass in building* Subcommittee SC 1, *Product considerations.*

This third edition cancels and replaces the second edition (ISO 12543-2:2011), which has been technically revised.

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

— Editorial changes

— ....

A list of all parts in the ISO 12543 series can be found on the ISO website.

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.

Glass in building — Laminated glass and laminated safety glass —

Part 2: Laminated safety glass

1 Scope

This part of ISO 12543 specifies performance requirements for laminated safety glass as defined in ISO 12543-1.

NOTE It specifies the requirements necessary to demonstrate that the product complies with the standards. Any defects that are found in installed laminated safety glass are dealt with in part 6.

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 12543-1, *Glass in building — Laminated glass and laminated safety glass — Part 1: Definitions and description of component parts*

ISO 12543-4:2011, *Glass in building — Laminated glass and laminated safety glass — Part 4: Test methods for durability*

ISO 12543-5, *Glass in building — Laminated glass and laminated safety glass — Part 5: Dimensions and edge finishing*

ISO 12543-6, *Glass in building — Laminated glass and laminated safety glass — Part 6: Appearance*

ISO 29584, *Glass in building — Pendulum impact testing and classification of safety glass*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 http://www.electropedia.org/

3.1
delamination
usually a two-dimensional visual effect which is caused by local loss of adhesion between the glass or plastic glazing material and the interlayer

Note 1 to entry: Local total loss of adhesion between the glass or plastic glazing material and the interlayer leads to a local increase of light reflection.

3.2
bubble
usually a three-dimensional visual effect which is caused by gaseous inclusions in the interlayer or at the interface between glass and interlayer

3.3
haze
scattering of incident light by a specimen resulting in a reduction of direct light transmittance and the contrast of objects viewed through the glass

3.4
cloudiness
local variation in the scattering of incident light by a specimen resulting in a reduction of direct light transmittance and the contrast of objects viewed through the glass

3.5
discoloration
significant change of colour of a laminated safety glass, caused by oxidization processes in the interlayer

Note 1 to entry: In clear interlayers, discoloration is usually perceived as yellowing.

4 Impact resistance

Laminated safety glass is distinguished from laminated glass by its performance under a pendulum impact test and its subsequent classification.

Note 1 Two test methods for pendulum impact testing are detailed in ISO 29584.

Note 2 Depending on the regulation in force of the country of installation different pendulum impact test methods may be applicable.

5 Durability of laminated safety glass and laminated safety glass with fire-resistant properties

5.1 High-temperature tests

5.1.1 General

Laminated safety glass shall be tested in accordance with 5.1.2.

A manufacturer can choose to test laminated safety glass in accordance with 5.1.3 instead of 5.1.2.

A successful test according to 5.1.3 also fulfils the requirements for a test according to 5.1.2. In case of an unsuccessful test according to 5.1.3 the laminated glass shall be tested according to 5.1.2.

The durability of laminated safety glass is dependent upon the following factors:

— interlayer type;

— presence of plastic glazing sheet materials;

— presence of encapsulated materials;

— the environment under which the laminated glass is installed.

The manufacturer's choice of test method may depend upon the above-mentioned factors.

5.1.2 Short high temperature test

Laminated safety glass shall be tested in accordance with ISO 12543-4:2019, 5.3.2, and evaluated in accordance with ISO 12543-4:2019, 5.4. No fault (i.e. bubbles, delamination, haze or cloudiness) shall be found in three test specimens.

If faults are found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, 5.3.2, and evaluated in accordance with ISO 12543-4:2019, 5.4. No fault shall be found in any of these three test specimens.

5.1.3 Long high temperature test

Laminated safety glass shall be tested in accordance with ISO 12543-4: 2019,5.3.3, and evaluated in accordance with ISO 12543-4:2019, 5.4. No fault (i.e. bubbles, delamination, haze or cloudiness) shall be found in three test specimens.

If faults are found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, 5.3.3, and evaluated in accordance with ISO 12543-4:2019, 5.4. No fault shall be found in any of these three test specimens.

5.2 Humidity test

Laminated safety glass shall be tested in accordance with ISO 12543-4:2019, 6.3.1, and evaluated in accordance with ISO 12543-4:2019, 6.4. No fault (i.e. bubbles, delamination, haze or cloudiness) shall be found in three test specimens.

If faults are found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, 6.3.1, and evaluated in accordance with ISO 12543-4:2019, 6.4. No fault shall be found in any of these three test specimens.

5.3 Radiation test

Laminated safety glass shall be tested in accordance with ISO 12543-4:2019, Clause 7, and evaluated in accordance with ISO 12543-4:2019, 7.5.1. The luminous transmittance of three irradiated test specimens shall not change by more than:

a) ±3 % of their value before exposure for initial light transmittances of greater than 65 %, or

b) ±2 % of their absolute value for initial light transmittances of less than or equal to 65 %.

When visually inspected, no fault (i.e. bubbles, delamination, haze or cloudiness) shall be found in the three irradiated test specimens.

If faults are found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, Clause 7, and evaluated in accordance with ISO 12543-4:2019, 7.5.1. No fault shall be found in any of these three test specimens.

6 Durability of fire-resistant laminated safety glass

6.1 General

The durability of fire-resistant laminated safety glass is dependent upon its exposure to direct solar radiation.

NOTE 1 Fire-resistant laminated safety glass glazed externally is subject to direct solar radiation.

NOTE 2 Fire-resistant laminated safety glass glazed internally is not normally subject to direct solar radiation.

Fire-resistant laminated safety glass not normally exposed to direct solar radiation shall comply with 6.2.

Fire-resistant laminated safety glass normally exposed to direct solar radiation shall comply with 6.3.

6.2 Humidity test for glass that is not normally exposed to direct solar radiation

Fire-resistant laminated safety glass shall be tested in accordance with ISO 12543-4:2011, 6.3.2, and evaluated in accordance with ISO 12543-4:2019, 6.4. No delamination shall be found in three test specimens.

If delamination is found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, 6.3.2, and evaluated in accordance with ISO 12543-4:2019, 6.4. No fault shall be found in any of these three test specimens.

6.3 Tests for glass that is normally exposed to direct solar radiation

6.3.1 Humidity test

Fire-resistant laminated safety glass shall be tested in accordance with ISO 12543-4:2019, 6.3.1, and evaluated in accordance with ISO 12543-4:2019, 6.4. No delamination shall be found in three test specimens.

If delamination is found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, 6.3.1, and evaluated in accordance with ISO 12543-4:2019, 6.4. No fault shall be found in any of these test specimens.

6.3.2 Radiation test

Fire-resistant laminated safety glass shall be tested in accordance with ISO 12543-4:2011, Clause 7, and evaluated in accordance with ISO 12543-4:2019, 7.5.2. No delamination shall be found in three test specimens.

If delamination is found in only one test specimen, three new test specimens shall be tested in accordance with ISO 12543-4:2019, Clause 7, and evaluated in accordance with ISO 12543-4:2011, 7.5.2. No fault shall be found in any of these test specimens.

7 Component parts

The description of component parts of laminated safety glass shall be as given in ISO 12543-1.

8 Dimensions and edge finishing

The dimensions and edge finishing of laminated safety glass shall be in accordance with ISO 12543-5.

9 Acoustic properties test

Unless otherwise specified in the applicable legislation the acoustic properties of the laminated safety glass should be tested in accordance with ISO 22897.

The acoustic properties of the interlayer may be tested according to ISO 16940.

The loss factor for the first mode may be defined when tested according to ISO 16940.

NOTE From the values obtained by the method in ISO 16940, it is possible to calculate R_w and $R_w + C_{tr}$ ratings of laminated glazing according to ISO 22897 or EN 12758.

10 Appearance

The appearance of laminated safety glass shall be in accordance with ISO 12543-6.

