INTERNATIONAL STANDARD

ISO 12543-3

Second edition
2011-08-15

Glass in building — Laminated glass and laminated safety glass —

Part 3: Laminated glass

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

Partie 3: Verre feuilleté

Reference number
ISO 12543-3:2011(E)

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Published in Switzerland

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.

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.

ISO 12543-3 was prepared by Technical Committee ISO/TC 160, *Glass in building*, Subcommittee SC 1, *Product considerations*.

This second edition cancels and replaces the first edition (ISO 12543-3:1998), which has been technically revised.

ISO 12543 consists of the following parts, under the general title *Glass in building — Laminated glass and laminated safety glass*:

— *Part 1: Definitions and description of component parts*

— *Part 2: Laminated safety glass*

— *Part 3: Laminated glass*

— *Part 4: Test methods for durability*

— *Part 5: Dimensions and edge finishing*

— *Part 6: Appearance*

Glass in building — Laminated glass and laminated safety glass —

Part 3: Laminated glass

1 Scope

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

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

ISO 12543-2, *Glass in building — Laminated glass and laminated safety glass — Part 2: Laminated safety glass*

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12543-1 and ISO 12543-2 apply.

4 Impact resistance

By definition, laminated glass does not possess an impact resistance or classification.

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

5.1 High-temperature test

5.1.1 General

Durability of laminated glass is dependent upon the following factors:

— interlayer type;

— presence of plastic glazing sheet materials;

— presence of encapsulated materials.

The choice of test method is dependent upon the above-mentioned factors.

Laminated glass not incorporating plastic glazing sheet materials shall be tested in accordance with 5.1.2.

Laminated glass incorporating plastic glazing sheet materials and/or encapsulated materials shall be tested in accordance with 5.1.3.

NOTE A manufacturer can choose to test laminated glass incorporating encapsulated materials in accordance with 5.1.2.

5.1.2 Laminated glass that does not include plastic glazing materials

Laminated glass shall be tested in accordance with ISO 12543-4:2011, 5.3.2, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 5.3.2, and evaluated in accordance with ISO 12543-4:2011, 5.4. No fault shall be found in any of these test specimens.

5.1.3 Laminated glass that includes plastic glazing materials and/or encapsulated material

Laminated glass shall be tested in accordance with ISO 12543-4:2011, 5.3.3, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 5.3.3, and evaluated in accordance with ISO 12543-4:2011, 5.4. No fault shall be found in any of these test specimens.

5.2 Humidity test

Laminated glass shall be tested in accordance with ISO 12543-4:2011, 6.3.1, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 6.3.1, and evaluated in accordance with ISO 12543-4:2011, 6.4. No fault shall be found in any of these test specimens.

5.3 Radiation test

Laminated glass shall be tested in accordance with ISO 12543-4:2011, Clause 7, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, Clause 7, and evaluated in accordance with ISO 12543-4:2011, 7.5.1. No fault shall be found in any of these test specimens.

6 Durability of fire-resistant laminated glass

6.1 General

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

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

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

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

Fire-resistant laminated 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 glass shall be tested in accordance with ISO 12543-4:2011, 6.3.2, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 6.3.2, and evaluated in accordance with ISO 12543-4:2011, 6.4. No fault shall be found in any of these test specimens.

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

6.3.1 Humidity test

Fire-resistant laminated glass shall be tested in accordance with ISO 12543-4:2011, 6.3.1, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 6.3.1, and evaluated in accordance with ISO 12543-4:2011, 6.4. No fault shall be found in any of these test specimens.

6.3.2 Radiation test

Fire-resistant laminated glass shall be tested in accordance with ISO 12543-4:2011, Clause 7, and evaluated in accordance with ISO 12543-4:2011, 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 12543-4:2011, 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 glass shall be as given in ISO 12543-1.

8 Dimensions and edge finishing

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

9 Acoustic properties test

The acoustic properties of the laminated glass may be tested according to 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 in accordance with 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 glazings according to ISO 22897 or EN 12758.

10 Appearance

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

11 Designation

Laminated glass shall be designated by:

— type;

— reference to this part of ISO 12543;

— nominal thickness, in millimetres;

— nominal width, B, and nominal length, H, in millimetres.

EXAMPLE A fire-resistant laminated glass with a thickness of 6,4 mm, a width of 2,0 m, and a length of 1,50 m is designated as:

Fire-resistant laminated glass ISO 12543-3 - 6,4 - 2000 x 1500

Bibliography

[1] ISO 16940, *Glass in building — Glazing and airborne sound insulation — Measurement of the mechanical impedance of laminated glass*

[2] ISO 22897, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*

[3] EN 12758, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*