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**Glass in building — Laminated glass and  
laminated safety glass —**

Part 6:  
**Appearance**

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

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*Partie 6: Aspect*

ISO 12543-6:2011

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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.

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 12543-6 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 12543-6:1998), 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*

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# Glass in building — Laminated glass and laminated safety glass —

## Part 6: Appearance

### 1 Scope

This part of ISO 12543 specifies defects of finished sizes and test methods with regard to the appearance of laminated glass when looking through the glass.

NOTE Special attention is paid to acceptability criteria in the vision area.

This part of ISO 12543 is applicable to finished sizes at the time of supply.

### 2 Normative references

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

### 3 Terms and definitions

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

#### 3.1

##### **spot defect**

type of defect that includes opaque spots, bubbles and foreign bodies

#### 3.2

##### **linear defect**

type of defect that includes foreign bodies and scratches or grazes

#### 3.3

##### **other defect**

glass defect, such as vents and interlayer defects, such as creases, shrinkage and streaks

**3.4**

**opaque spot**

visible defect in the laminated glass

EXAMPLES Tin marks and inclusions in the glass or interlayer.

**3.5**

**bubble**

usually air, in the glass or interlayer

**3.6**

**foreign body**

unwanted item introduced into the laminated glass during manufacture

**3.7**

**scratch**

linear damage to the outside surface of the laminated glass

**3.8**

**graze**

damage to the outside surface of the laminated glass

**3.9**

**vent**

sharp-tipped fissure or crack running into the glass from an edge

**3.10**

**crease**

distortion introduced into the interlayer by folds visible after manufacture

**3.11**

**streak due to interlayer inhomogeneity**

distortion in the interlayer, caused by manufacturing defects in the interlayer, which are visible after manufacture

**3.12**

**edge area**

perimeter of the pane, which is generally contained within the glazing system

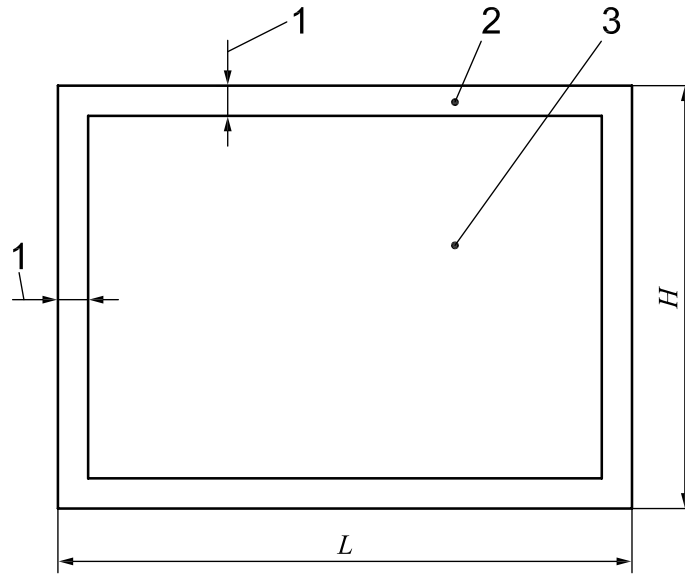
NOTE For pane sizes that are less than 5 m<sup>2</sup>, the width of the edge area as given in Figure 1 is 15 mm. The width of the edge area is increased to 20 mm for pane sizes that are greater than 5 m<sup>2</sup>.

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**Key**

- |   |                    |     |                |
|---|--------------------|-----|----------------|
| 1 | width of edge area | $L$ | width of pane  |
| 2 | edge area          | $H$ | height of pane |
| 3 | vision area        |     |                |

**Figure 1 — Areas to be examined on finished sizes ready for glazing**

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**3.13****vision area**

main area of the glass that excludes the edge area

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**4 Principle**

The laminated glass is put in a vertical position, in front of and parallel to a matt grey screen, and is lit by diffuse daylight or equivalent.

The laminated glass is visually inspected perpendicularly at a distance of 2 m from the glass, with the matt screen on the other side of the glass.

Any visible defects that are disturbing shall be marked.

**5 Defects in the edge area for framed edges**

When inspected according to the test method given in Clause 9, defects which do not exceed 5 mm in diameter or 5 % to the edge area are permitted.

**6 Vents**

Vents are not permitted.

**7 Creases and streaks**

These are not allowed in the visual area.

## 8 Defects in the vision area

### 8.1 Spot defects in the vision area

When inspected according to the test method given in Clause 9, the admissibility of spot defects depends on the following:

- size of the defect;
- frequency of the defect;
- size of the pane;
- number of panes as components of a laminated glass.

The number of permissible defects in a pane shall be in accordance with Table 1.

Defects less than 0,5 mm shall not be considered.

Defects greater than 3 mm shall not be permitted.

NOTE Admissibility of spot defects in laminated glass is independent of the individual glass thickness.

**Table 1 — Permissible spot defects in the vision area**

Size of defect <i>d</i> mm	0,5 < <i>d</i> ≤ 1,0		1,0 < <i>d</i> ≤ 3,0			
	ISO 12543-6:2011					
Size of pane <i>A</i> m <sup>2</sup>	<a href="https://standards.iteh.ai/catalog/standards/sist/982c9213-e049-4ff9-b247-7c4856cdcd0/iso-12543-6-2011">https://standards.iteh.ai/catalog/standards/sist/982c9213-e049-4ff9-b247-7c4856cdcd0/iso-12543-6-2011</a>					
	for all sizes	<i>A</i> ≤ 1	1 < <i>A</i> ≤ 2	2 < <i>A</i> ≤ 8	<i>A</i> > 8	
Number or density of permissible defects	2 panes	no limitation; however, no accumulation of defects	1	2	1/m <sup>2</sup>	1,2/m <sup>2</sup>
	3 panes		2	3	1,5/m <sup>2</sup>	1,8/m <sup>2</sup>
	4 panes		3	4	2/m <sup>2</sup>	2,4/m <sup>2</sup>
	≥5 panes		4	5	2,5/m <sup>2</sup>	3/m <sup>2</sup>

NOTE An accumulation of defects occurs if four or more defects are at a distance of <200 mm from each other. This distance is reduced to 180 mm for laminated glass consisting of three panes, to 150 mm for laminated glass consisting of four panes and to 100 mm for laminated glass consisting of five or more panes.

The number of permissible defects in Table 1 shall be increased by one for each individual interlayer which is thicker than 2 mm.



## 8.2 Linear defects in the vision area

When inspected according to the test method given in Clause 9 linear defects are allowed as given in Table 2.

**Table 2 — Number of permissible defects in the vision area**

Area of pane m <sup>2</sup>	Number of permissible defects >30 mm in length <sup>a</sup>
≤5	not allowed
5 to 8	1
>8	2

<sup>a</sup> Linear defects less than 30 mm in length are allowed.

## 9 Defects in the edge area for unframed edges

Laminated glass is usually installed in frames. However, if laminated glass is unframed, its edges may be as follows, in accordance with ISO 12543-5:

- ground edges;
- polished edges;
- bevelled edges.

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When inspected according to the test method given in this clause, shells and bubbles are permissible if they do not become obvious. Interlayer defects, i.e. extrusions and retractions, are permissible.