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Third edition
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Glass in building — Laminated glass and laminated safety glass —

Part 5: Dimensions and edge finishing

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

Partie 5: Dimensions et façonnage des bords

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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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This document was prepared by Technical Committee ISO/TC 160, *Glass in building* Subcommittee SC 1, *Product considerations,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 129, *Glass in building,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 12543-5:2011), which has been technically revised.

The main changes compared to the previous edition are 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 5:
Dimensions and edge finishing

1 Scope

This document specifies dimensions, limit deviations and edge finishes of laminated glass and laminated safety glass for use in building.

This document is not applicable to panes having an area less than 0,05 m^2.

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12543-1 and the following 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
offset
d
misalignment at any one edge of the constituent glass panes or plastic glazing sheet material making up the laminated glass

Note 1 to entry: See Figure 2.

Note 2 to entry: In the previous edition of this document the term “displacement” was used instead.

4 Dimensions and limit deviations

4.1 Thickness

4.1.1 Nominal thickness

The nominal thickness of laminated glass shall be the sum of the nominal thicknesses of the constituent panes of glass, plastic glazing sheet material and the interlayers.

4.1.2 Limit deviation on thickness

4.1.2.1 Limit deviation on thickness of folio laminated products

The limit deviations on thickness of laminated glass shall not exceed the sum of the limit deviations of the constituent glass panes specified in the basic products standards.

NOTE For the appropriate CEN and ISO standards, see ISO 12543-1:2021, Bibliography.

If the total interlayer thickness is less than or equal to 2 mm, an additional limit deviation of ±0,1 mm applies. If the total interlayer thickness is greater than 2 mm, an additional limit deviation of ±0,2 mm shall apply.

If the plastic glazing sheet material is covered by a standard, the limit deviations on thickness given in the standard shall be used. If the plastic glazing sheet material is not covered by a standard the producer of any plastic glazing sheet material shall indicate the limit deviation on thickness.

EXAMPLE A laminated glass made from two sheets of float glass of 3 mm nominal thickness and a folio interlayer of 0,5 mm. The limit deviation of 3 mm float glass is given as ±0,2 mm and the limit deviation of the folio interlayer is ±0,1 mm. Therefore, the nominal thickness is 6,5 mm and the limit deviation is ±0,5 mm.

4.1.2.2 Limit deviations on thickness of cast-in-place products

The limit deviations on the thickness of cast-in-place laminated glass shall not exceed the sum of the limit deviations of the constituent glass panes specified in the basic products standards and the limit deviations of the cast-in-place interlayers.

The thickness limit deviation for plastic glazing sheet material shall be assumed to be the same as a float glass of the same nominal thickness.

NOTE If the plastic glazing sheet material is covered by a standard, the actual limit deviations on thickness can be used.

The thickness limit deviations of cast-in-place interlayers shall be in accordance with Table 1.

Table 1 — Limit deviations on the thickness of cast-in-place interlayers

Dimensions in millimetres

Interlayer thickness	Limit deviation
<1	±0,4
≥1 to <2	±0,5
≥2 to <3	±0,6
≥3	±0,7

EXAMPLE A laminated glass made from two sheets of float glass of 3 mm nominal thickness and a cast-in-place interlayer of 1,5 mm. The limit deviation of 3 mm float glass is given as ±0,2 mm and from Table 1 the interlayer tolerance is ±0,5 mm. Therefore, the nominal thickness is 7,5 mm and the limit deviation is ±0,9 mm.

4.1.2.3 Limit deviations on thickness of fire-resistant laminated glass

The limit deviations on thickness of fire-resistant laminated glass shall not exceed the sum of the limit deviations of the constituent glass panes specified in the basic products standards and the limit deviations of the fire-resistant interlayers.

The thickness limit deviation for plastic glazing sheet material shall be assumed to be the same as a float glass of the same nominal thickness.

NOTE If the plastic glazing sheet material is covered by a standard, the actual limit deviations on thickness can be used.

For the fire-resistant interlayers of fire-resistant laminated glass, the limit deviations shall be in accordance with Table 2.

Table 2 — Limit deviations on the thickness of a fire-resistant interlayer

Dimensions in millimetres

Interlayer thickness	Limit deviation
<1	±0,4
≥1 to <2	±0,5
≥2 to <5	±0,6
≥5	±0,7

4.1.2.4 Limit deviations on the thickness of combinations

For laminated glass comprising of different kinds of interlayers, the limit deviation on the thickness of the laminated glass shall be the sum of the allowed limit deviations of the constituent glass panes and the square root of the sum of the squares of the interlayer limit deviations, rounded to the nearest 0,1 mm.

EXAMPLE A laminated glass made from four sheets of float glass of nominal thickness 3 mm, a folio interlayer of 0,5 mm thickness and two fire-resistant interlayers of 1,5 mm thickness:

Nominal thickness: $4 \times 3 \text{ mm} + 0{,}5 \text{ mm} + 2 \times 1{,}5 \text{ mm} = 15{,}5 \text{ mm}$

Limit deviation: $4 \times (\pm 0{,}2 \text{ mm}) \pm \sqrt{0{,}1^2 + 0{,}5^2 + 0{,}5^2} \text{ mm} = \pm 0{,}8 \text{ mm} \pm 0{,}714 \text{ mm} = \pm 1{,}5 \text{ mm}$

The manufacturer should indicate the absolute maximum deviation on total thickness for the respective product.

4.1.3 Measurement of thickness

The thickness of the pane shall be calculated as the mean of measurements taken at the centres of the four sides. The measurements shall be taken to an accuracy of 0,01 mm and the mean is then rounded to the nearest 0,1 mm.

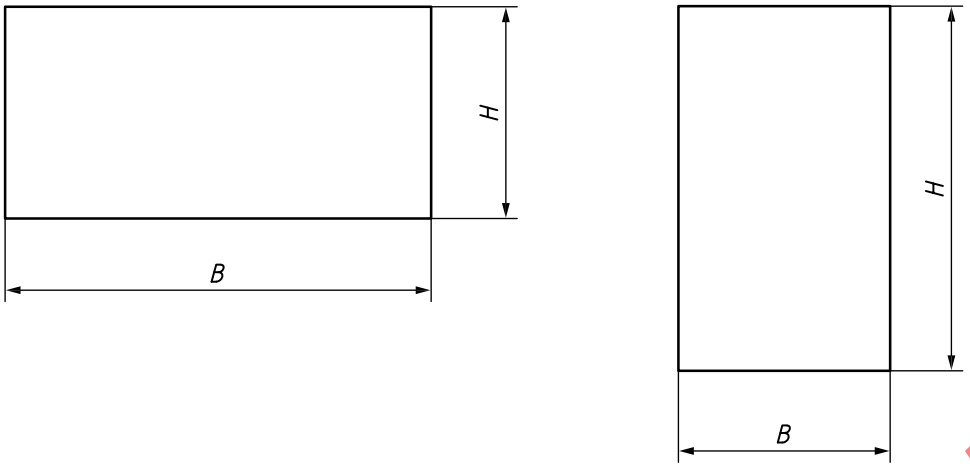
The individual measurements, when rounded to the nearest 0,1 mm, shall also be within the limit deviations.

For laminated glass incorporating patterned glass, the measurement shall be made by means of an instrument of the plate gauge type with a diameter of 55 mm ± 5 mm.

4.2 Width, *B*, and length, *H*

4.2.1 General

When laminated glass sizes are quoted for rectangular panes, the first dimension shall be the width, *B*, and the second dimension the length, *H*, as shown in Figure 1.



Key

B width

H length

Figure 1 — Width and length relative to the pane shape

The maximum width and length of laminated glass are dependent on the constituent glass and interlayers used in its composition and on the manufacturing plant of each individual manufacturer. Each manufacturer should indicate the maximum and minimum size they can produce.

Dimensions shall be given in millimetres. Each dimension shall be within the specified limit deviations.

4.2.2 Methods of measuring dimensions and squareness

The pane of glass shall not be larger than the nominal dimensions, given in accordance with 4.2.1, increased by the upper limit deviation, t_1, or smaller than the nominal dimensions decreased by the lower limit deviation, t_2.

The squareness of rectangular glass panes is expressed by the difference between its diagonals.

The difference between the two diagonals shall not be larger than the limit deviation, *v*, as specified in Table 4.

4.2.3 Limit deviations on width, *B*, and length, *H*

Limit deviations on width, *B*, and length, *H*, are given in Table 3 for finished sizes and stock sizes. Any displacement shall be included in these limit deviations.

NOTE Offset is covered in 4.2.4.

If one component of the laminated glass is a toughened or heat-strengthened glass an additional tolerance of ±3 mm shall be taken into account.

Table 3 — Limit deviations, t_1 and t_2, for width, B, and length, H, for finished and stock sizes

Dimensions in millimetres

		Nominal dimension B or H	Nominal thickness of laminated glass ≤8 mm	Nominal thickness of laminated glass >8 mm	
				Nominal thickness of each glass pane <10 mm	Nominal thickness of at least one glass pane ≥10 mm
Limit deviation	t_1	≤ 2 000	+3,0 −2,0	+3,5 −2,0	+5,0 −3,5
	t_2				
	t_1	≤ 3 000	+4,5 −2,5	+5,0 −3,0	+6,0 −4,0
	t_2				
	t_1	>3 000	+5,0 −3,0	+6,0 −4,0	+7,0 −5,0
	t_2				

The limit deviations given in Table 3 do not apply for fire-resistant laminated glass and fire-resistant laminated safety glass. In these cases, the manufacturer shall specify the limit deviations.

The limit deviations, v, for the difference between diagonals are given in Table 4.

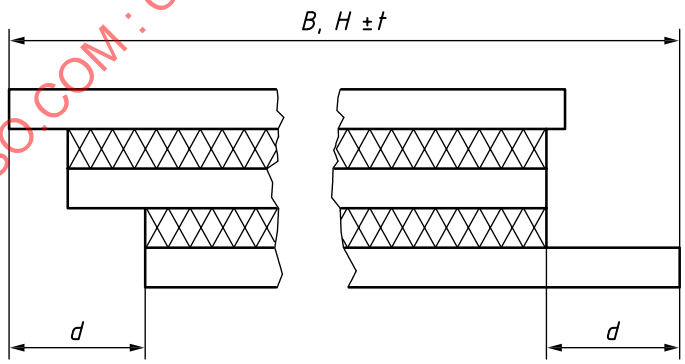
Table 4 — Limit deviation, v, on the difference between diagonals

Dimensions in millimetres

	Nominal dimension B or H	Nominal thickness of laminated glass ≤8 mm	Nominal thickness of laminated glass >8 mm	
			Nominal thickness of each glass pane <10 mm	Nominal thickness of at least one glass pane ≥10 mm
Limit deviation v	≤ 2 000	6	7	9
	≤ 3 000	8	9	11
	>3 000	10	11	13

4.2.4 Offset

The maximum offset, d, shall be measured as shown in Figure 2.



Key

B width
H length
d offset
t limit deviation

Figure 2 — Offset

The maximum offset, d, shall be as specified in Table 5. The width, B, and length, H, shall be considered separately. If a reference edge is specified, the offset shall be limited to 1 mm.

Table 5 — Maximum offset, *d*, for cut sizes and stock sizes

Dimensions in millimetres

Length and width *B* or *H*	Maximum offset *d*
≤2 000	2,0
≤3 000	3,0
>3 000	4,0

The offset shall be included in the limit deviations on length and width.

5 Edge finishes

5.1 General

Thermally treated glasses shall not be cut, sawn or drilled after processing into laminated glass.

However, there are certain situations where a manufacturer needs to undertake edgework on laminated glass incorporating heat-strengthened glass. This is only permissible if the manufacturer has internal evidence that the properties of the heat-strengthened glass, especially the mechanical strength, are maintained after edge working.

NOTE Tempered safety glass, heat-soaked tempered safety glass and heat-strengthened glass can be individually worked prior to thermal treatment in accordance with an applicable standard.

It is allowed to protect the edges of laminated glass or laminated safety glass by an adhesive protection provided that the compatibility with the interlayers has been demonstrated.

5.2 Cut edge

These are either originally cut edges of the constituent glass panes not subsequently worked (see Figure 3), or the edges of the laminated glass which have been cut and not subsequently worked (see Figure 4).

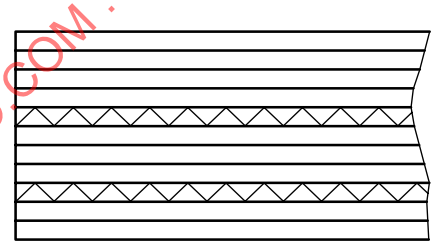


Figure 3 — Cut edge produced by the individual cut edges of the constituent glass panes which are not subsequently worked

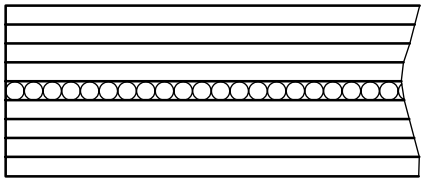


Figure 4 — Cut edge of cut laminated glass which is not subsequently worked

5.3 Worked edges

5.3.1 Arrissed edge

The originally cut edges of the outer glass panes of the laminated glass shall be ground off (see Figure 5).

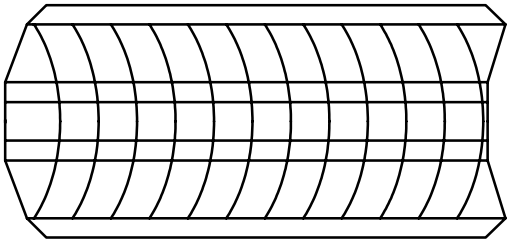


Figure 5 — Arrissed edge

5.3.2 Ground edge

The glass shall be arrissed and flat ground (see Figure 6).

NOTE Some bright areas can still exist on the edge face.

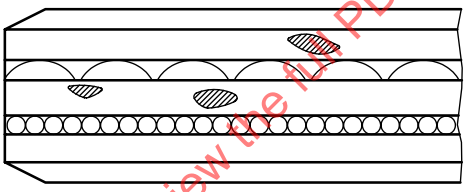


Figure 6 — Ground edge

5.3.3 Smooth ground edge

The edge face of the arrissed glass shall be ground and then smoothed with a finer grit than is used for ground edges and all bright areas shall be removed (see Figure 7).

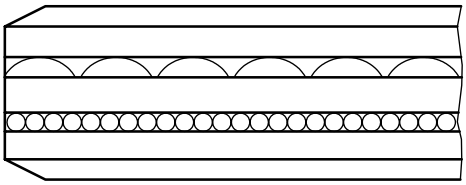


Figure 7 — Smooth ground edge

5.3.4 Polished edge

The previously smooth ground edge shall be polished in order to obtain a high lustre on the arrissed and smoothed edges' surface (see Figure 8).