
**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*



Foreword

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International Standard ISO 12543-5 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 160, *Glass in building*, Subcommittee SC 1, *Product consideration*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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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Foreword

The text of EN ISO 12543-5:1998 has been prepared by Technical Committee CEN/TC 129 "Glass in building", the secretariat of which is held by IBN, in collaboration with Technical Committee ISO/TC 160 "Glass in building".

This part of the standard is one of a series of interrelated parts:

- EN ISO 12543-1: Glass in building - Laminated glass and laminated safety glass - Part 1: Definitions and description of component parts
- EN ISO 12543-2: Glass in building - Laminated glass and laminated safety glass - Part 2: Laminated safety glass
- EN ISO 12543-3: Glass in building - Laminated glass and laminated safety glass - Part 3: Laminated glass
- EN ISO 12543-4: Glass in building - Laminated glass and laminated safety glass - Part 4: Test methods for durability
- EN ISO 12543-5: Glass in building - Laminated glass and laminated safety glass - Part 5: Dimensions and edge finishing
- EN ISO 12543-6: Glass in building - Laminated glass and laminated safety glass - Part 6: Appearance

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1998, and conflicting national standards shall be withdrawn at the latest by November 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Standard specifies dimensions, limit deviations, and edge finishes of laminated glass and laminated safety glass for use in building. It does not apply to panes having an area less than 0,05 m².

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 572-2	Glass in building - Basic soda lime silicate glass products - Part 2: Float glass
EN 572-3	Glass in building - Basic soda lime silicate glass products - Part 3: Polished wired glass
EN 572-4	Glass in building - Basic soda lime silicate glass products - Part 4: Drawn sheet glass
EN 572-5	Glass in building - Basic soda lime silicate glass products - Part 5: Patterned glass
EN 572-6	Glass in building - Basic soda lime silicate glass products - Part 6: Wired patterned glass
EN 1748-1	Glass in building - Special basic products - Part 1: Borosilicate glasses
EN 1748-2	Glass in building - Special basic products - Part 2: Glass ceramics
prEN 1863	Glass in building - Heat strengthened glass
prEN 12150	Glass in building - Thermally toughened safety glass

3 Dimensions and limit deviations

3.1 Thickness

3.1.1 Nominal Thickness

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

3.1.2 Limit deviation on thickness

3.1.2.1 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 as specified in the basic products standards : EN 572-2 to EN 572-6, EN 1748-1 and EN 1748-2. The limit deviation of the interlayer shall not be taken into account if the total interlayer thickness is < 2 mm. If the total interlayer thickness is ≥ 2 mm a limit deviation of $\pm 0,2$ mm applies. For plastics glazing sheet material the limit deviation on thickness shall be assumed to be the same as a float glass of the same nominal thickness (see EN 572-2).

NOTE: If the plastics glazing sheet material is covered by a European Technical agreement, then the actual limit deviations on thickness can be used.

EXAMPLE: A laminated glass made from two sheets of float glass of 3 mm nominal thickness and an interlayer of 0,5 mm. From EN 572-2, the limit deviation of 3 mm float glass is $\pm 0,2$ mm. Therefore, the nominal thickness is 6,5 mm and the limit deviation is $\pm 0,4$ mm.

3.1.2.2 Limit deviations on thickness of cast in place products

The limit deviation on thickness of cast in place products shall not exceed the sum of the limit deviations of the constituent glass panes as specified in the basic products standards, i.e. EN 572-2 to EN 572-6, and the limit deviations of the cast in place interlayers.

For plastics glazing sheet material the limit deviation shall be assumed to be the same as a float glass of the same nominal thickness (see EN 572-2).

NOTE: If the plastics glazing sheet material is covered by a European Technical agreement, then the actual limit deviations on thickness can be used.

The permitted limit deviations on thickness of cast-in-place interlayers are given in table 1.

Table 1: Limit deviations on thickness of cast-in-place products

Interlayer thickness	Limit deviation
< 1 mm	$\pm 0,4$ mm
≥ 1 mm to < 2 mm	$\pm 0,5$ mm
≥ 2 mm to < 3 mm	$\pm 0,6$ mm
≥ 3 mm	$\pm 0,7$ mm

3.1.2.3 Limit deviations on thickness of fire resistant laminated glass

The limit deviation on thickness of the fire resistant laminated glass shall not exceed the sum of the limit deviations of the constituent glass panes as specified in the basic

products standards, i.e. EN 572-2 to EN 572-6, and the limit deviations of the fire resistant interlayers.

For plastics glazing sheet material the limit deviation shall be assumed to be the same as a float glass of the same nominal thickness (see EN 572-2).

NOTE: If the plastics glazing sheet material is covered by a European Technical agreement, then the actual limit deviations on thickness can be used.

For the fire resistant interlayers of fire resistant laminated glass the limit deviations of table 2 are permitted:

Table 2: Limit deviations on thickness of fire resistant laminated glass

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

3.1.2.4 Limit deviations on thickness of combinations

For laminated glass comprising different kinds of interlayers the limit deviation on 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: $4 \times (\pm 0,2 \text{ mm}) \pm \sqrt{0,5^2 \text{ mm} + 0,5^2 \text{ mm}} =$
 $\pm 0,8 \text{ mm} \pm 0,707 \text{ mm} = \pm 1,5 \text{ mm}$

3.1.3 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 $55 \text{ mm} \pm 5 \text{ mm}$.

3.2 Width B and length H

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:

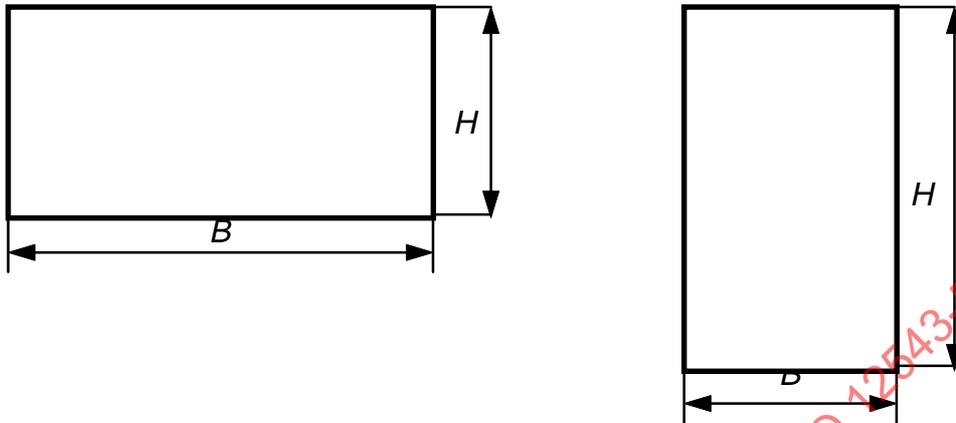


Figure 1: Width and length relative to pane shape

NOTE: 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 indicates the maximum and minimum size he can produce.

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

3.2.1 Methods of measuring dimensions and squareness

The nominal dimensions for width B and length H being given, the pane shall not be larger than a prescribed rectangle resulting from the nominal dimensions increased by the upper limit deviation t or smaller than a prescribed rectangle resulting from the nominal dimensions reduced by the lower limit deviation t . The sides of the prescribed rectangles are parallel to one another and these rectangles shall have a common centre. The limits of squareness shall be prescribed by these rectangles (see figure 2).

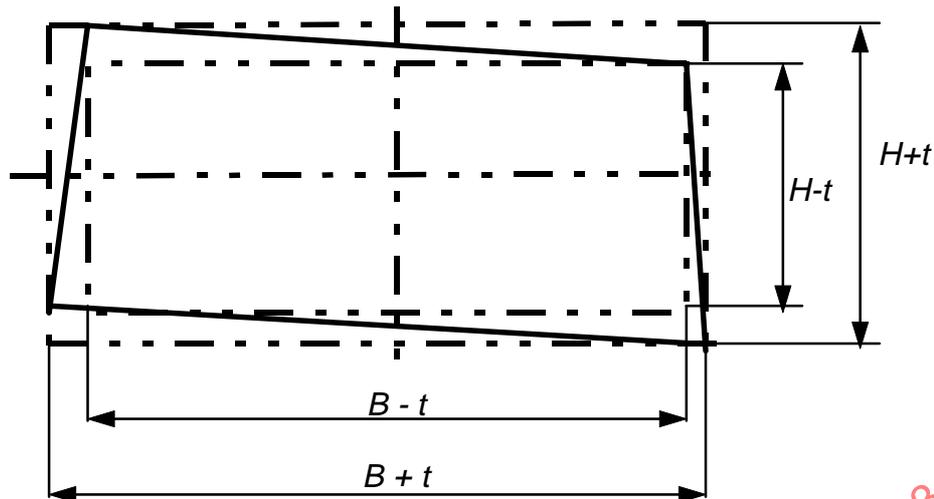


Figure 2: Limit deviations for dimensions of rectangular panes

3.2.2. 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 in table 4 for stock sizes.

Any displacement (see 3.2.3) shall be included in these limit deviations.

Table 3: Limit deviations for finished sizes

Limit deviations t on width B or length H mm			
Nominal dimension B or H mm	Nominal Thickness ≤ 8 mm	Nominal thickness > 8 mm	
		Each glass pane < 10 mm nominal thickness	At least one glass pane ≥ 10 mm nominal thickness
< 1100	+ 2,0 - 2,0	+ 2,5 - 2,0	+ 3,5 - 2,5
< 1500	+ 3,0 - 2,0	+ 3,5 - 2,0	+ 4,5 - 3,0
< 2000	+ 3,0 - 2,0	+ 3,5 - 2,0	+ 5,0 - 3,5
< 2500	+ 4,5 - 2,5	+ 5,0 - 3,0	+ 6,0 - 4,0
> 2500	+ 5,0 - 3,0	+ 5,5 - 3,5	+ 6,5 - 4,5

Table 4: Limit deviations for stock sizes

Limit deviations t on width B or length H mm			
Nominal dimension B or H mm	Nominal thickness ≤ 8 mm	Nominal thickness < 10 mm nominal thickness	Nominal thickness > 8 mm At least one glass pane ≥ 10 mm nominal thickness
up to 6000 x 3210	+ 5,0 - 3,0	+ 6,0 - 4,0	+ 8,0 - 6,0

The limit deviations given in tables 3 and 4 do not apply for fire resistant laminated glass and fire resistant laminated safety glass. In this case the manufacturer will specify the limit deviations.

3.2.3 Displacement

Displacement d (see figure 3) is the misalignment at any one edge of the constituent glass panes or plastic glazing sheet material making up the laminated glass.

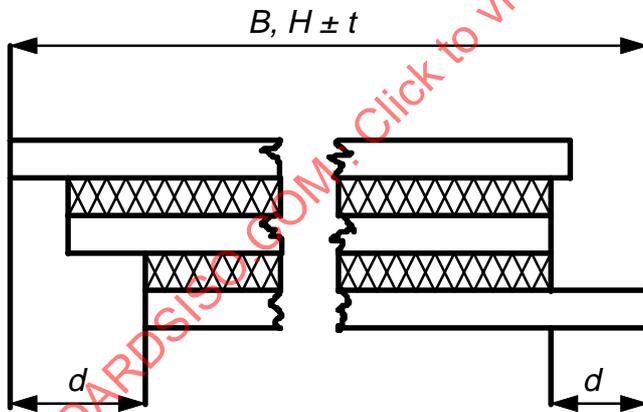


Figure 3: Displacement

The maximum displacement d shall be as given table 5. Width B and length H shall be considered separately.

Table 5: Maximum Displacement

Nominal dimension B or H mm	Maximum permissible displacement d mm
$B, H \leq 1000$	2,0
$1000 < B, H \leq 2000$	3,0
$2000 < B, H \leq 4000$	4,0
$B, H > 4000$	6,0

4 Edge finishes

Thermally toughened safety glass and heat strengthened glass shall not be cut, sawn, drilled or edgeworked after making into a laminate, but may be individually worked before toughening or heat strengthening in accordance with prEN 1863 and prEN 12150.

NOTE: Attention is drawn on the following drafts:

prEN 13024-1 and (WI 00129055); (WI 00129057)

The edges of fire resistant laminated glass and fire resistant laminated safety glass may be protected by an adhesive tape.

4.1 Cut edge

These are either originally cut edges of the constituent glass panes not subsequently worked (see figure 4), or the edges of the laminated glass which have been cut and not subsequently worked (see figure 5).

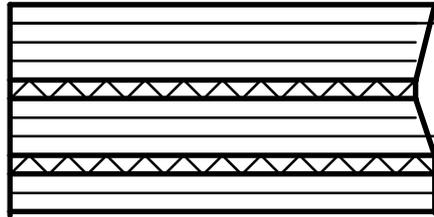


Figure 4: Cut edge built by cut edges of the constituent glass panes not subsequently worked

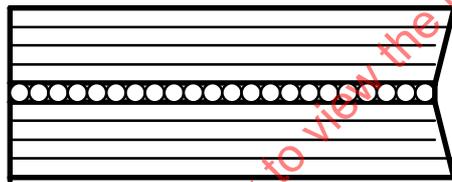


Figure 5: Cut edge of cut laminated glass, not subsequently worked

4.2 Worked edges

4.2.1 Arrissed edge (see figure 6)

The originally cut edges of the outer glass panes of the laminated glass shall be ground off.

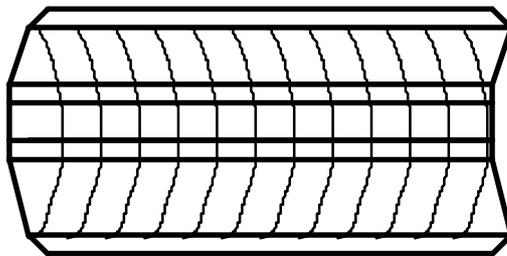


Figure 6: Arrissed edge