INTERNATIONAL STANDARD

ISO 16293-3

First edition
2017-03

Glass in building — Basic soda lime silicate glass products —

Part 3: Polished wired glass

Verre dans le bâtiment — Produits de base: Verre de silicate sodo-calcique —

Partie 3: Verre armé poli

Reference number
ISO 16293-3:2017(E)

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Foreword

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The committee responsible for this document is ISO/TC 160, *Glass in building*, Subcommittee SC 1, *Product considerations*.

A list of all parts in the ISO 16293 series can be found on the ISO website.

Glass in building — Basic soda lime silicate glass products —

Part 3: Polished wired glass

1 Scope

This document specifies dimensional and minimum quality requirements (in respect of optical, visual and wire faults) for polished wired glass, as defined in ISO 16293-1, for use in building.

This document applies only to polished wired glass supplied in rectangular panes, in stock sizes and final cut sizes.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16293-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

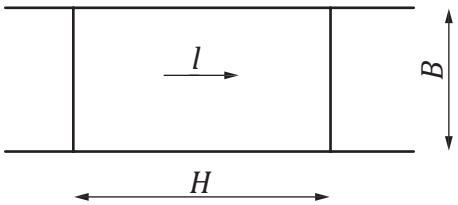
— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
length
H
dimension of the straight edge of the glass parallel to the direction of draw of the glass ribbon

Note 1 to entry: See Figure 1.

[SOURCE: ISO 11485-1:2011, 2.26, modified]



Key

l direction of draw
H length
B width

Figure 1 — Relationship between length, width and direction of draw

3.2
width
B
dimension of the edge of the glass perpendicular to the direction of the glass ribbon

Note 1 to entry: See Figure 1.

3.3
stock size
glass sizes that are intended to be re-cut to obtain *final cut sizes* (3.4)

3.4
final cut size
pane of glass that has been cut down to the dimensions being required either for installation or processing into a final product, e.g. insulating glass units, of those dimensions

3.5
optical faults
faults which lead to distortions in the appearance of objects observed through the glass

3.6
visual faults
faults which alter the visual quality of the glass

Note 1 to entry: Visual faults include spot faults, linear/extended faults and wire faults.

3.7
spot fault
fault which can be in or on the glass in the form of gaseous inclusion, solid inclusion, mark or deposit of small size

3.8
spherical or quasi-spherical spot faults
spot faults (3.7) whose larger dimension is less than or equal to twice the smaller dimension

3.9
elongated spot faults
spot faults (3.6) whose lager dimension is more than twice the smaller dimension

3.10
linear/extended faults
faults which can be on or in the glass, in the form of deposits, marks or scratches which occupy any extended long area

3.11
wire faults
deviation of the wire, penetration of the glass surface by the wire or break in the wire in body of the glass

3.12
deviation of the wire
deviation, *x*, *y* or *z*, of the wire in relation to a reference, e.g. line or straight edge (see Figure 3)

3.13
edge defect
defect which can occur on the edge of a glass sheet in the form of entrant and emergent faults and/or bevels

4 Dimensional requirements

4.1 Thickness

4.1.1 General

The actual thickness shall be the average of four measurements taken to the nearest 0,01 mm, one taken at the centre of each side. Measurement shall be by means of an instrument of calliper micrometre type.

4.1.2 Tolerance

All four measurements, rounded to the nearest 0,1 mm shall not vary from the nominal thickness by more than the limits shown in Table 1.

Table 1 — Thickness tolerance

Dimensions in millimetres

Nominal thickness	Limiting values	
	Minimum	Maximum
7	6,2	7,4
10	9,1	10,9

4.2 Length, width and squareness

The tolerances, t, on nominal dimensions length, H, and width, B, are ±4 mm.

The limits of squareness are described by the difference between diagonals. Limits are given in Table 2.

Table 2 — Limit on the difference between diagonals

Dimensions in millimetres

Nominal glass thickness	Limit on the difference between diagonals		
	Stock sizes and final cut sizes		
	Splits		
	$(H, B) \leq 1500$	$1500 < (H, B) \leq 3000$	$(H, B) > 3000$
7 and 10	3	4	5

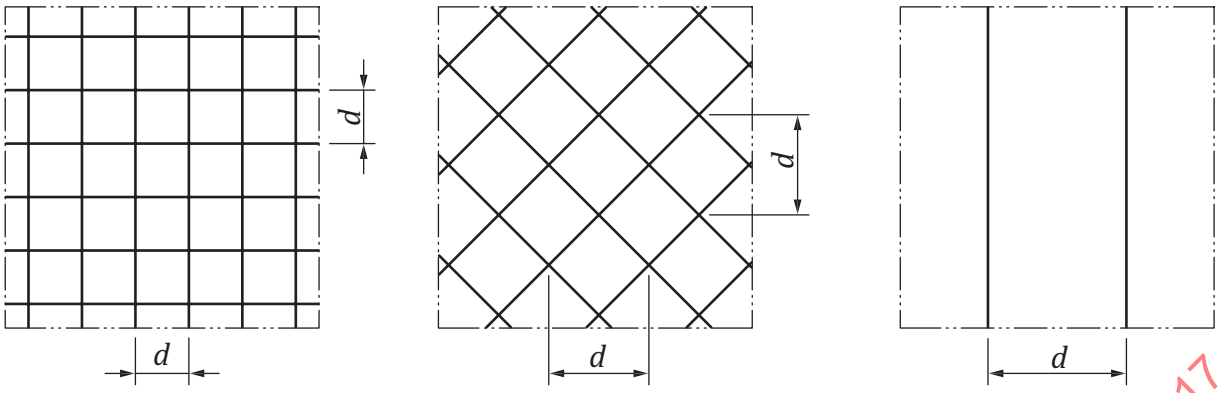
4.3 Wire mesh

4.3.1 Diameter of wires

Diameter of wires shall be 0,42 mm or more.

4.3.2 Mesh dimension

All intersections shall be welded. The mesh dimension, d, shall not exceed 16 mm for square, 32 mm for diamond. The spacing s for parallel strand shall be from 45 mm to 55 mm (see Figure 2).



Key

d mesh dimensions

Figure 2 — Mesh dimension

5 Quality requirements

5.1 General

One quality is considered in this document. This is determined by evaluation of the optical and visual faults.

Many spot faults are associated with the wire, due to the incorporation of the wire into the glass. Spot faults can, thus, be distinguished by their relationship with the wire:

— distance from the wire >2 mm;

— distance from the wire ≤2 mm, or in contact with the wire.

There are three different types of deviation of the wire considered, which may occur simultaneously. They are shown in Figure 3 and are

— out of square,

— waviness, and

— bow.

5.2 Methods of observation and measurement

5.2.1 Optical faults

The glass pane to be examined is placed 1 m from a bank of strip lights. The observer stands 1 m away from the glass pane.

The strip lights are viewed through the glass and any disrobing distortions within the glass pane are noted.

5.2.2 Visual faults

5.2.2.1 Spot and linear/extended faults

The glass pane to be examined is illuminated in conditions approximating to diffuse daylight and is observed in front of a matt black screen (reflection coefficient between 0,2 and 0,4)

Place the pane of glass to be examined vertically in front of the screen and parallel to it. Arrange the point of observation 2 m from the glass, keeping the direction of observation normal to the glass surface.

View the pane of glass, and note the presence of visually disturbing faults.

a) Spot faults

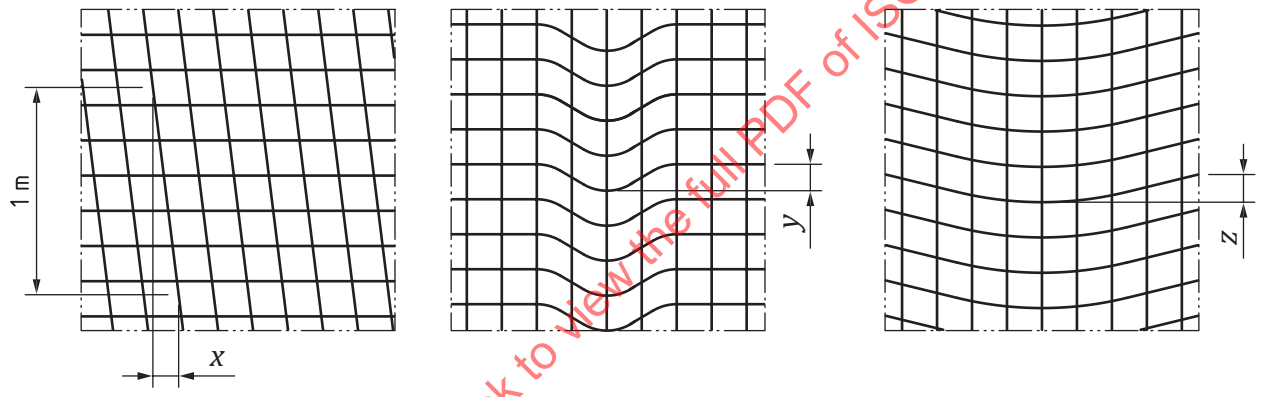
Measure the dimensions of these faults with a micrometre with graduations in tenths of a millimetre. Note the number, dimensions and concentration of the spot faults together with their relationship to the wire.

b) Linear/extended faults

Note the number of these faults.

5.2.2.2 Wire faults

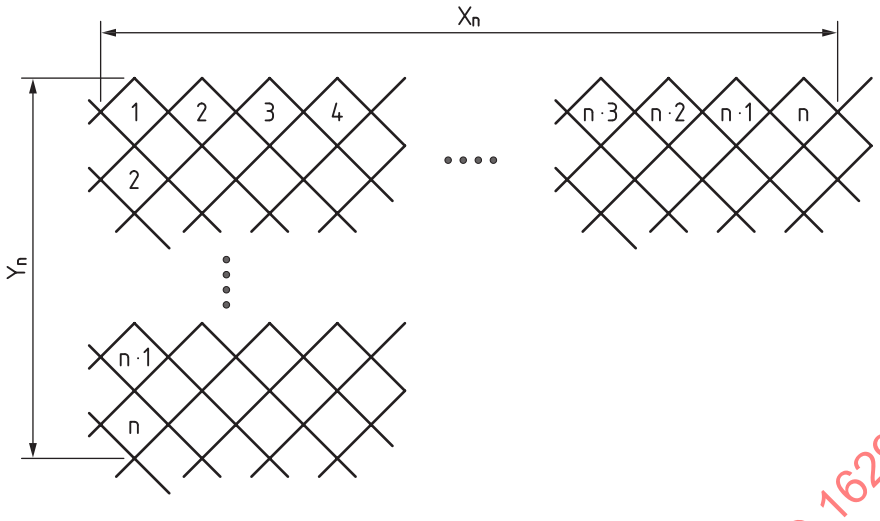
A reference, e.g. line or straight edge, is placed parallel to the direction of the wires. The deviation of the wire in relation to this reference edge is measured (see Figures 3 to 5).



Out of square Waviness Bow

NOTE The scale of these drawings is exaggerated to be explicit.

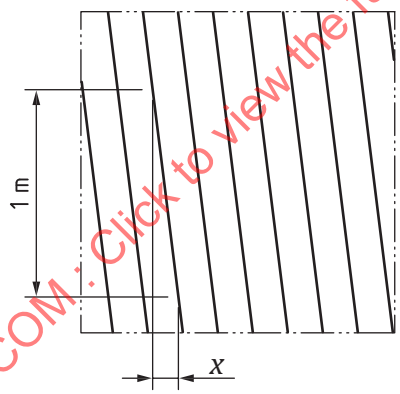
Figure 3 — Representations of the types of wire deviations (square)



Out of shape

NOTE The scale of this drawing is exaggerated to be explicit.

Figure 4 — Representations of the types of wire deviations (diamond)



Out of parallel

NOTE The scale of these drawings is exaggerated to be explicit.

Figure 5 — Representations of the types of wire deviations (parallel)

Any penetration of the glass surface by the wire is noted.

Any breaks in the wire are noted.

5.2.3 Edge defects for final cut sizes

5.2.3.1 Entrant and emergent faults

These faults are shown in Figures 4 and 5. The dimensions h_1, h_2 and p and the glass thickness, e, are measured.

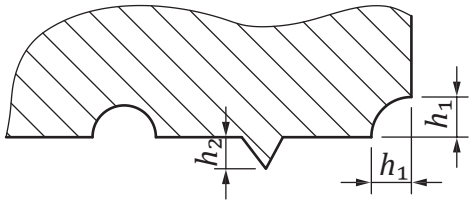


Figure 6 — Entrant and emergent faults (surface view)

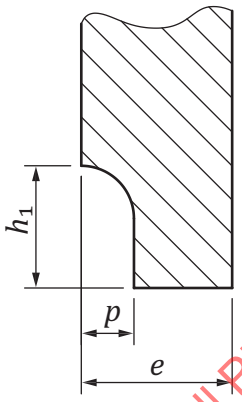


Figure 7 — Entrant faults (edge view)

5.2.3.2 Bevel

This fault is shown in Figure 6. The dimension, d, and the glass thickness, e, are measured.

Figure 8 — Bevel (edge view)

5.3 Acceptance levels

5.3.1 Optical faults

The observer should not see any disturbing distortions within the glass pane.

5.3.2 Visual faults

5.3.2.1 Spot faults

The allowable numbers for type of spot faults are shown in Tables 3 and 4.

Table 3 — Spherical and quasi-spherical spot faults

Distance from wire [mm]	Core size for large dimension [mm]	Maximum in any pane [piece(s)/m²]
≤2,0	≤2,0	Any number
	>2,0 and ≤4,0	1
	>4,0	0
>2,0	≤1,5	Any number
	>1,5 and ≤4,0	1
	>4,0	0

Table 4 — Elongated spot fault

Width of fault [mm]	Length of fault [mm]	Maximum in any pane [piece(s)/m²]
≤1,0	≤2,0	Any number
	>2,0 and ≤5,0	5
	>5,0 and ≤10,0	1
	>10,0 and ≤15,0	0,5
	>15,0	0
>1,0	≤5,0	1
	>5,0	0

5.3.2.2 Linear/extended faults

There shall be no visually observable defect in the observation conditions described in 5.2.2.1.

5.3.2.3 Wire faults

5.3.2.3.1 Square

The deviation, *x*, (see Figure 3) shall not exceed 16 mm per metre for the out of square.

The deviation, *y* and *z*, shall not exceed 16 mm for the waviness and bow, respectively.

NOTE The deformation of the wires of each square of the mesh is not considered.

No penetration of the surface is acceptable.

Breaks in the wire are not acceptable.

5.3.2.3.2 Diamond

The ratio, X_n/Y_n, (see Figure 4) shall not exceed 0,9 or 1,1 for the out of shape.

No penetration of the surface is acceptable.

Breaks in the wire are not acceptable.

5.3.2.3.3 Parallel

The deviation, *x*, (see Figure 5) shall not exceed 16 mm per metre for the out of parallel.

No penetration of the surface is acceptable.

Breaks in the wire are not acceptable.

