Norma zakładowa

DIVERSA Sp. z o. o.
Ul. Krasnowolska 50
02-849 Warszawa
Zakład w Prudniku
Ul. Prężyńska 23
48-200 Prudnik
NIP 8992485305

COMPANY STANDARD

I. PURPOSE:

This Company Standard of Diversa Diversa Sp. z o.o. Sp.k. (Limited partnership) has been created based on the Polish Standards:
PN-EN 572-2 „ Float glass".
PN-EN 12150-1 „Glass in construction"

The Company Standard of Diversa Diversa Sp. z o.o. Sp.k, defines the basic parameters of glass products of Diversa as well as their quality standards and possible deviations with reference to the standards PN-EN 12150-1 and PN-EN 570-2 as well as with reference to internal company arrangements.

II. TECHNOLOGICAL CAPBILITIES OF DIVERSA

2.1 Cutting and polishing of glass edges

- ✓ Trapezoid (pencil) cut

- ✓ C-edge cut

2.2 Thickness of cut glass and its dimensions

- ✓ Thickness 3 ÷ 19
- ✓ Max. dimension 3200 mm

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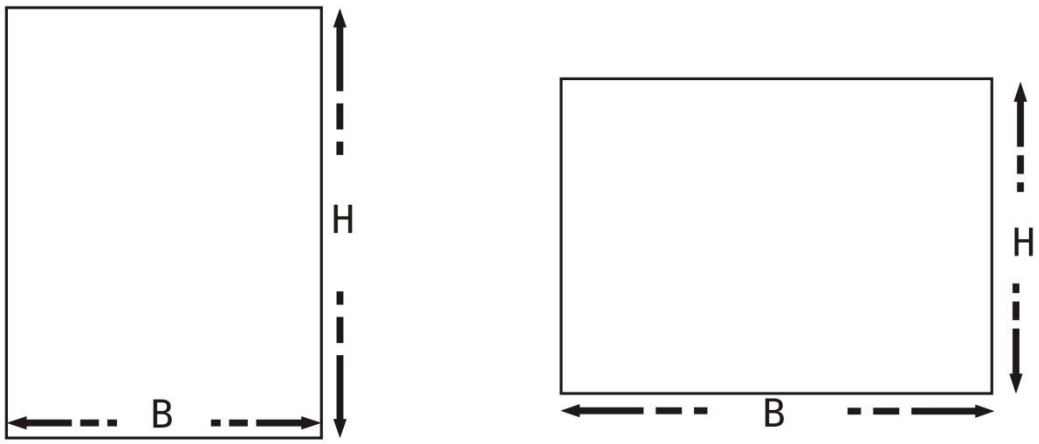
2.3 Drilling holes in glass

- ✓ Min. glass thickness 3 mm
- ✓ Max glass thickness 19 mm
- ✓ Min. hole diameter Ø 6 mm
- ✓ Max. hole diameter Ø 60 mm
- ✓ Glass bevelling – every time.

III. DIMENSIONS

B – width
H – length

Glass dimensions are given with reference to rectangular plate, the first dimension is width B, and then length H, as shown below:



Dimensions should be given in millimetres. Every dimension should fit within defined limit deviations.

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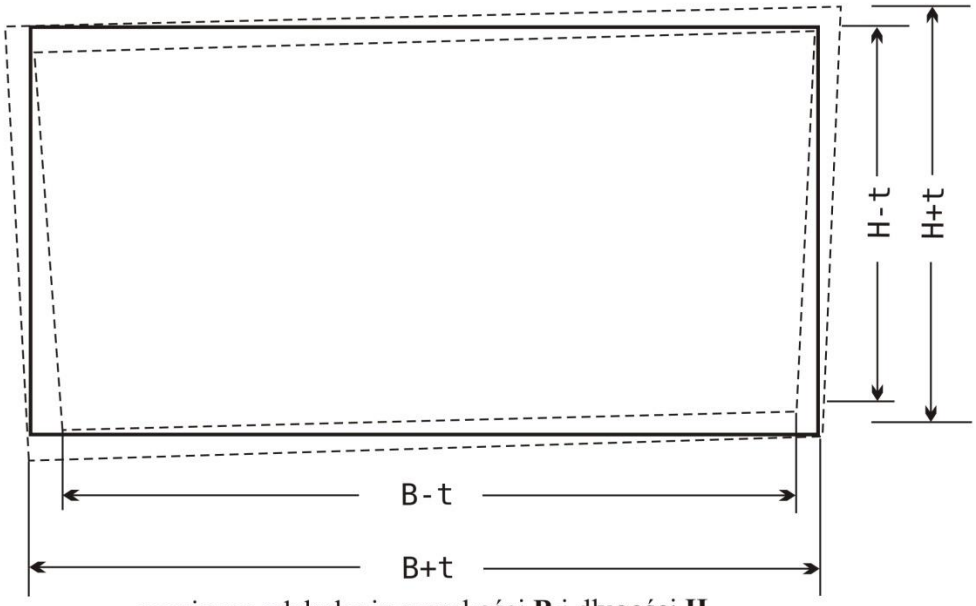
IV. ALLOWABLE DIMENSION DEVIATIONS.



graniczne odchylenia szerokości **B** i długości **H**

Limit deviations of width B and length H are given in the table below:

Glass dimensions	Thickness		
	Nominal thickness ≤ 8 mm	Nominal thickness > 8 mm	
		Glass plates with nominal thickness < 10 mm	Glass plates with nominal thickness ≥ 10 mm
< 1100	+2,0 -2,0	+2,5 -2,0	+3,5 -2,5

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< 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

V. GLASS DIMENSION TOLERANCES

Tolerance acc. to PN-EN 12150-1

SHAPE AND DIMENSIONS		
Nominal dimensions of side (in millimetres)	Tolerance	
	Thickness d ≤ 12 mm	Thickness d ≥ 12 mm
≤ 1000	± 1 mm	± 1,5 mm
1000 < side ≤ 2000	± 2,5 mm	± 3 mm
2000 < side ≤ 3000	± 3 mm	± 4 mm
> 3000	± 4 mm	± 5 mm

APPLICATION OF LOWER TOLERANCE MUST RESULT FROM ARRANGEMENTS WITH THE CUSTOMER, CONFIRMED ON THE ORDER!!!

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VI. TOLERANCES OF NON-TEMPERED GLASS ;

Thickness measurement

Glass thickness shall be calculated as an average of measurements in the centres of fours sides. Measurements must be made with accuracy of 0,01mm, and the average rounded to 0,1mm.

If individual measurements were rounded to approx. 0,1mm, they also should fit within limit deviations as presented below:

Limit deviation of Float Glass thickness

Limit deviation of float Glass thickness	
Thickness (mm)	tolerance
3	+/-0,2
4	+/-0,2
5	+/-0,2
6	+/-0,3
8	+/-0,3
10	+/-0,3
12	+/-0,3
15	+/-0,5
19	+/-1

VII. HOLES IN GLASS

Due to technology reasons there are some limitations concerning location of holes in relation to the glass edge, corner, as well as their location relative to each other.

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Variables that influence the limitations of holes location:

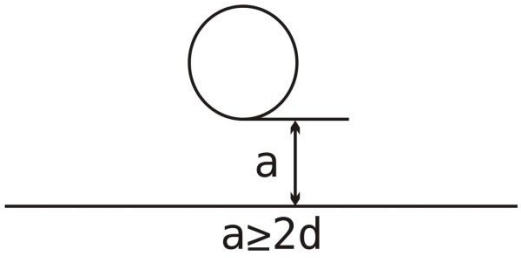
d – nominal glass thickness

B,H – dimensions of sides

Ø – hole diameter

- number of holes

Distance **a** from glass edge to hole edge should not be lower than doubled nominal glass thickness **2d**.



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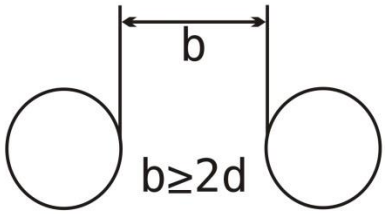
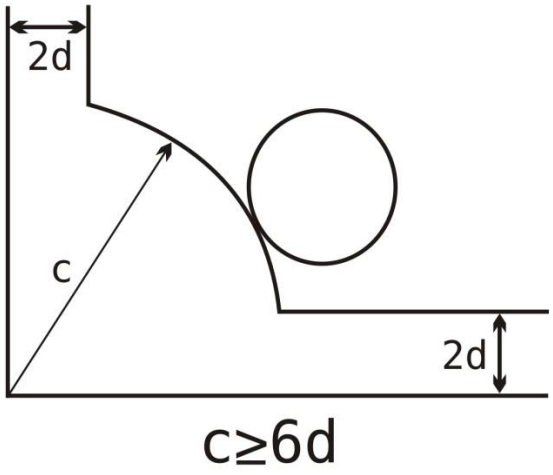


Distance **c** of hole edge from glass corner should not be lower than **6d.**



Tolerance for diameters of drilled holes:

Tolerance for diameters of drilled holes:	
Nominal diameter of hole Ø	Tolerance of hole diameter
6 mm ≤ Ø ≤ 20 mm	± 1,0 mm
6 mm ≤ Ø ≤ 60 mm	± 2,0 mm

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APPLICATION OF LOWER TOLERANCE OF HOLE MUST RESULT FROM ARRANGEMENTS WITH THE CUSTOMER, CONFIRMED ON THE ORDER!

SHAPE AND DIMENSIONS		
Nominal dimension of side (in millimetres)	Tolerance	
	Glass thickness d ≤ 12 mm	Glass thickness d ≥ 12 mm
≤ 1000	± 1 mm	± 1,5 mm
1000 < side ≤ 2000	± 2,5 mm	± 3 mm
2000 < side ≤ 3000	± 3 mm	± 4 mm
> 3000	± 4 mm	± 5 mm

VII. ALLOWABLE DEFECTS IN GLASS

Assessment of glass defects:
Glass should be watched placed in vertical position, in parallel to a mat screen, with dispersed daylight or equivalent. The observer

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should be at a distance of 2 m from the glass, watching it perpendicularly, against the mat screen – with BARE EYES.

Defects which are not visible from the distance defined in the standard – are not qualified as defects.

Type of defect	Occurrence
Spots and streaks	Allowable if not visible from approx. 1 m
Anisotropy (rainbow)	Effect that appears every time in tempered glass
Holes	Allowed small dents at edged of holes up to 0,5mm and skews of hole section to 0,5 mm.
Shallow scratches	Allowed polishing of shallow scratches with a special system that does not cause shallow recesses and deformations. Polishing process causes friction and heat generation, this leads to chemical reactions between paste components and glass. Glass particles are collected from the surface, filling all scratches. After cleaning of the repaired area it is impossible to find the defect in observation according to the PN standard.

Allowable defects in glass:

Type of defect	Glass surface (z)

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	z≤1,0 m²	1,0m² < z ≤ 2,0 m²	z > 2,0 m²
Spot defects – inclusions of foreign bodies	Not allowed	Not allowed	Not allowed
Open blisters (bursting)	Not allowed	Not allowed	Not allowed
Closed blisters	Allowed 2 pcs. in this max 2 mm	Allowed 3 pcs. in this max 2 mm	Allowed 5 pcs. in this max 2 mm
Linear defects	Allowed with total length 40 mm and thickness to 0,1 mm and max. length of single scratch to 15 mm	Allowed with total length 40 mm and thickness to 0,1 mm and max. length of single scratch to 15 mm	Allowed with total length 50 mm and thickness to 0,1 mm and max. length of single scratch to 15 mm
Defects of edges	Edge blunting – allowed small spalls on the edges provided they are blunted. Grinded edge (mat) – spalls, lacks of grinding (shining spots) – not allowed Polished edge (shining) – mat spots, spalls – not allowed		

ALL OTHER GLASS PARAMETERS NOT DESCRIBED ABOVE ARE SUBJECT TO APPROPRIATE STANDARDS REFERRING TO A GIVEN GLASS TREATMENT.

VIII. GLASS CRACKING

Glass is amorphous solid, has little internal stress, thanks to which it can be cut and treated. It is uniform, hard and brittle. Glass cracks due to **thermal or mechanical action of external factors**. This type of glass cracking caused after delivery of glass to the customer are not included in the guarantee and cannot be the basis for complaints.
advertising windows.

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IX. GUARANTEE

Guarantee **does not cover** glass cracks, breakages and scratches after acceptance of the products.
After acceptance of the products any notification (complaint) may refer to the **product tightness only.**

Physical properties of glass and its construction are decisive for specific properties which are not defects and are not subject to complaints:

1. Glass cracking,
2. Glass breakage,
3. Glass concavities and convexities,
4. Colour deviations,
5. anisotropy

Detailed guarantee for the products of float glass made by Diversa is comprised in a separate document.