Company standard

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

INTERNAL STANDARD

I. PURPOSE:

This Diversa Company Standard is based on the Polish Standards:

PN-EN 572-2 „ Szkło glass".
PN-EN 12150-1 „Glass in building"

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

II. DIVERSA'S TECHNOLOGICAL CAPABILITIES

2.1 Sanding and polishing of glass edges

- ✓ Trapezoidal (pencil) cut

- ✓ C-cut

2.2 Ground glass thickness and dimensions

- ✓ Thickness 3 ÷ 19
- ✓ Dimension max. 3200mm

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2.3 Drilling holes in glass

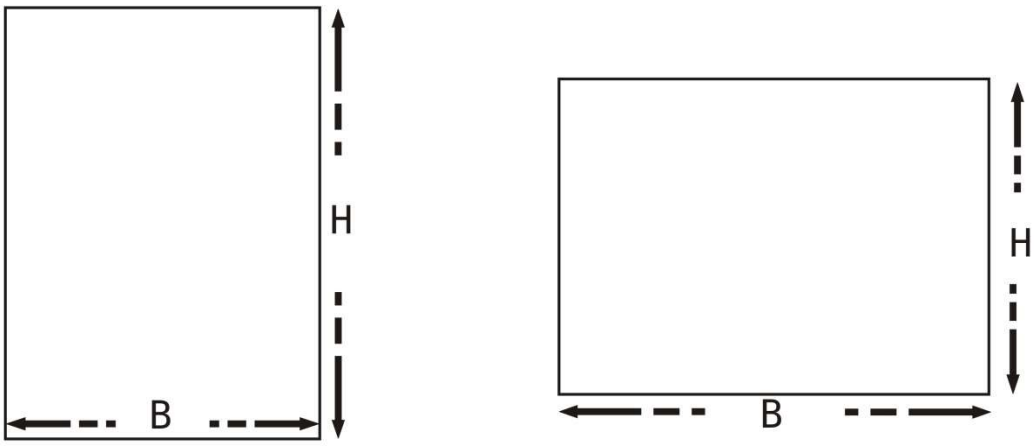
- ✓ Min. glass thickness 3 mm
- ✓ Max. glass thickness 19 mm
- ✓ Min. bore diameter Ø 6 mm
- ✓ Max. bore diameter Ø 60 mm
- ✓ Glass chamfering - each time.

III. DIMENSIONS

B – width

H – lenght

The dimensions of the glass are given in terms of rectangular panels, the first dimension being the width B and the second the length H, as shown in the figure:



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

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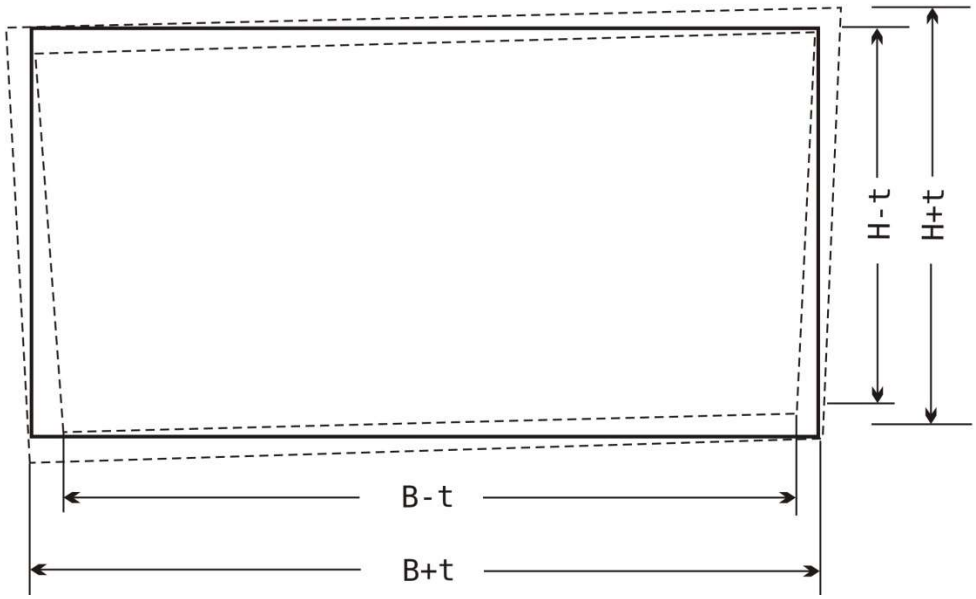
IV. PERMISSIBLE DIMENSIONAL



The limit deviation of width B and length H are given in the table below:

Dimensions of glass	Thickness		
	Nominal thickness ≤ 8 mm	Nominal thickness of glass > 8 mm	
		Glass sheets with nominal thickness < 10 mm	Glass sheets with a nominal thickness ≥ 10 mm
< 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

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V. GLASS DIMENSIONAL TOLERANCES

Tolerance under PN-EN 12150-1

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

THE USE OF A SMALLER TOLERANCE MUST BE THE RESULT OF AN AGREEMENT WITH THE CUSTOMER CONFIRMED ON THE ORDER!!!

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VI. PERFORMANCE TOLERANCES FOR NON-TEMPERED GLASS

Thickness measurement

The thickness of the glass should be calculated as the average of the measurements taken at the centres of the four sides. Measurements should be taken to the nearest 0.01 mm and the average rounded to the nearest 0.1 mm.

If individual measurements are rounded to approximately 0.1 mm, they should also be within the limit deviations shown below:

Boundary 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

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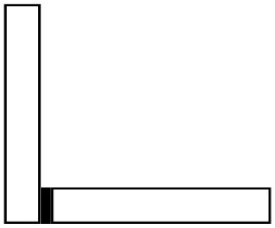
VII. PERFORMANCE TOLERANCES FOR SILICONE JOINTS

The watertightness of the aquarium is ensured by an internal silicone joint between the panes of glass that are glued together.

1. A 'jointless' joint. Process used for selected Opti glass products and used by agreement with the customer and confirmed on the order.



2. The joint, a silicone roller visible inside the container, is the result of an adopted technological process adapted to a glass thickness of 3-8 mm.
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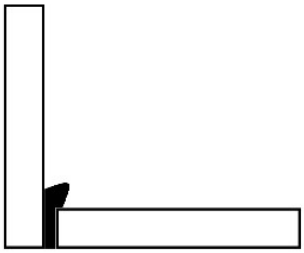

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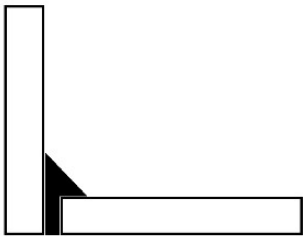
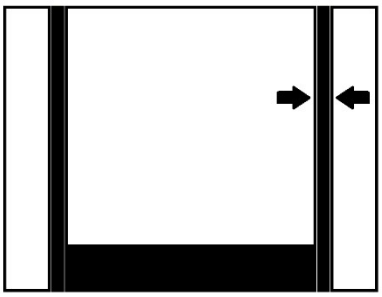
3. The silicone grout visible inside the tank is the result of an adopted technological process adapted to a glass thickness of 10-19 mm.



External joint thickness tolerance



External joint thickness tolerance.	
Glass thickness (mm)	Glass thickness (mm)
3	0-1
4	0-1
5	0-1
6	0-1
8	1-3
10	2-4
12	2-4
15	2-4
19	2-4

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VIII. HOLES IN GLASS

For technological reasons, there are limitations to the position of the holes in relation to the edge of the glass, the corner of the glass as well as the position of the holes in relation to each other.

Variables influencing the limitation of hole placement:

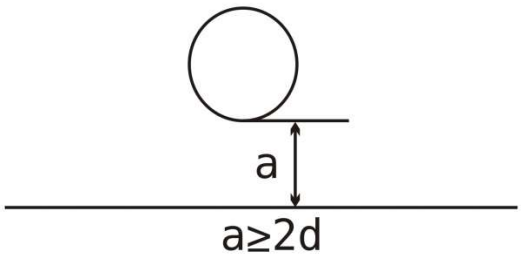
d - nominal thickness of glass

B,H - side dimensions

Ø - hole diameter

number of holes

The distance **a** from the edge of the glazing to the edge of the opening should not be less than double the nominal thickness of the **2d** glazing.



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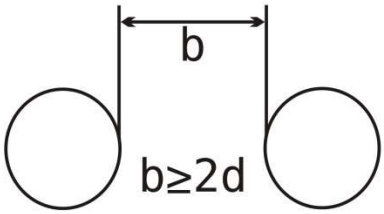
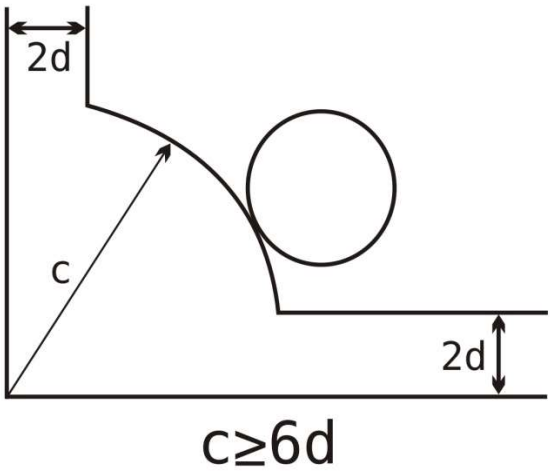


The distance **c** of the edge of the hole from the corner of the glass should not be less than **6d**.



Tolerance for borehole diameters:

Tolerance for borehole diameters:	
Nominal bore diameter Ø	Bore diameter tolerance
6 mm ≤ Ø ≤ 20 mm	± 1,0 mm
6 mm ≤ Ø ≤ 60 mm	± 2,0 mm

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

VII. ADMISSIBLE DEFECTS IN GLASS

Method of assessing glass defects:

The glass should be viewed upright and parallel to the frosted screen, in diffuse daylight or equivalent. The observer should be at a distance of 2 metres from the glass, observing it perpendicularly, against the background of a frosted screen - WITH THEIR EYE.

Defects that are not visible from the distance specified in the standard - are not qualified as defects.

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Type of defect	Number of occurrences
Stains and streaks	Acceptable if not visible from a distance of approximately 1m
Anisotropy (rainbow formation)	The effect that is always present in toughened glass
Holes	Slight chipping at the edge of the holes up to 0.5 mm and cross-sections of up to 0.5 mm are permissible.
Shallow scratches	It is permissible to polish shallow scratches with a special system that does not cause shallow pitting or deformation. The polishing process creates friction and heat, allowing chemical reactions to take place between the paste components and the glass. Glass particles are collected from the surface filling every scratch. Once the repaired area has been cleaned, it is impossible to locate the damage, under observation according to the PN standard.

Acceptable defects in glass:

Type of defect	Glass surface (z)		
	z≤1,0 m²	1,0m² < z ≤ 2,0 m²	z > 2,0 m²
Point defects in the form of foreign body inclusions	Unacceptable	Unacceptable	Unacceptable
Open (burst) blisters	Unacceptable	Unacceptable	Unacceptable
Closed blisters	Permissible 2 pcs. including max. 2mm	Permissible 3 pcs. including max. 2mm	Allowable 5 pcs. including max. 2mm
Linear defects	Acceptable with a total length of 40 mm and a	Acceptable with a total length of 40 mm and a thickness of up to 0.1	Acceptable with a total length of 50 mm and a thickness of up

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	thickness of up to 0.1 mm and a maximum length of a single crack of up to 15 mm	mm and a maximum length of a single crack of up to 15 mm	to 0.1 mm and a maximum length of a single crack of up to 15 mm
Edge defects	Blunted edge - minor chipping on the edge is permissible provided it is blunted Sanded edge (matt) - chipping, under-sanding (shiny areas) - not permissible Polished (shiny) edge - dull spots, chipping - unacceptable		

ANY OTHER GLASS PARAMETERS NOT DESCRIBED ABOVE ARE GOVERNED BY THE RELEVANT STANDARDS APPLICABLE TO THE PARTICULAR GLASS TREATMENT.

IX. GLASS CRACKING

Glass is an amorphous solid with negligible internal stresses, making it suitable for cutting and machining. It is a homogeneous body. Hard and brittle. Glass breaks due to **thermal or mechanical external factors**.

Such glass breakage occurring after the glass has been delivered to the customer is not included in the guarantee and cannot be the basis for a complaint about the glass.

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X. WARRANTY

The guarantee **does not cover cracks**, breakage of glass or scratches after receipt of the products.

Once the goods have been received, the notification can only concern the **tightness of the package**.

The physical properties of the glass and the construction of the glazing determine the special characteristics which are not defects and are not subject to complaint:

1. glass cracks,
2. glass breakage,
3. concavity and convexity of the glass,
4. colour deviations,
5. anisotropy

The detailed guarantee for Diversa float glass products is included in a separate document.