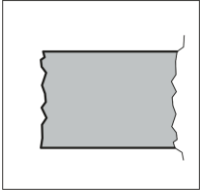


Edge work:

The edges of glass cut with rollers or diamonds or sawed are sharp and can be worked. On this page we are illustrating and explaining the different types of edge work and the specific terminologies used in industry

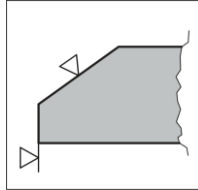
1. Cut edges

Glass is scribed with a diamond or hard metal wheel and then broken. The unworked broken edges are sharp.



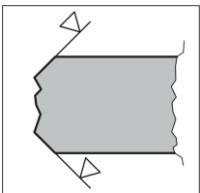
5. Bevelled edge

The edge is ground to form a bevel. In general a bevel is larger than a seam and may have any desired angle between 20° and 70°.



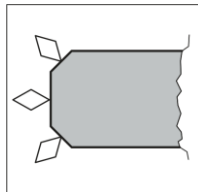
2. Cut and seamed edges

The sharp-edged glass (as in 1.) is seamed (smoothed and slightly bevelled). The edge is no longer sharp, there is a reduction of the danger of injury.



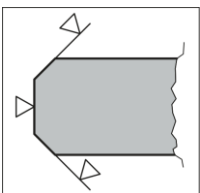
6. Polished edge

The edge type described in 3. to 5. may in addition be polished for transparency.



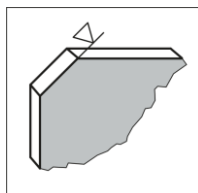
3. Ground edges (with seam)

The broken area is matt ground. Additionally the edge may be seamed as described in 2.



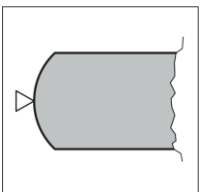
7. Dubbed corner

The pointed corners of rectangular glasses are slanted to minimize the danger of injury.



4. Half-round or C-edge

The broken area is ground to form a C. It is a matt finish.



Glass specifications

6 March 2015

Intended use:

Standard clear float glass used as cover glass for displays

Sort of mineral glass:

Standard clear float glass

Two panes of different size, standard clear float glass laminated

Processing:

Edge work, drilling, silk screen printing, thermal or chemical toughening, laminating etc.

Inspection- and visual condition:

Visual inspection must be done without optical aids at a distance of 25 - 35 cm and for 10 – 20 sec (depending on the size of the glass) under working conditions (800 – 1000 Lux) for working.

Requirements deviating from these specifications must be defined in writing in a **customer agreement**.

Quality Zones:

Standard clear float glass: visible area in final assembly

Two panes of standard clear float glass laminated: visible area in final assembly

Geometry

Length: see drawing or customer requirements

Width: see drawing or customer requirements

Diameter: see drawing or customer requirements

Standard tolerances for length, width and diameter			
Type	Thickness / mm	Straight edge Edge work 1 and 2	Straight edge Edge work 3 to 6
		Dimensions / mm	
		≤ 1000	
Single glass	≤ 4 - < 8	± 0.5	± 0.2
	≥ 8 - ≤ 12	± 1.0	± 0.5

Squareness

Standard tolerances for length, width and diameter			
Type	Thickness / mm	Straight edge Edge work 1 and 2	Straight edge Edge work 3 to 6
		Dimensions / mm	
		≤ 500	
Single glass	≤ 4	1.5	1.0
	> 4 - < 8	1.5	1.0
	≥ 8 - < 10	1.5	1.0
	≥ 10 - ≤ 12	1.5	2.0

Glass specifications

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Inner diameter (of the drilled hole): see drawing or customer requirements

Standard tolerance:

Diameter	Tolerance
Ø ≤ 30 mm	± 0.2 mm
Ø > 30 mm	± 0.5 mm

Position (of the drilled hole) : see drawing or customer requirements

- | | | |
|------------------------------------|------------------------|----------|
| - Straight edge, Edge work 1 and 2 | - Thickness ≤ 4 - < 8 | ± 0.5 mm |
| | - Thickness ≥ 8 - ≤ 12 | ± 1.0 mm |
| - Straight edge, Edge work 3 to 6 | - Thickness ≤ 4 - < 8 | ± 0.2 mm |
| | - Thickness ≥ 8 - ≤ 12 | ± 0.5 mm |

Thickness

Nominal thickness (mm)	Tolerance of thickness (mm)
Single glass (2.0 - 6.0)	± 0,2
Single glass (8.0 - 12.0)	± 0.3
Laminated glass	Depending on the laminate

Flatness (after thermal toughening)

Dimensions	Deviation
≤ 300 mm	1.0 mm max.
> 300 mm ... ≤ 700 mm	2.0 mm max.

Glass defects (see Quality zone description)

Inclusions (bubbles, stones, knots)* **and Glass particles** (cullet)*:

Defect size g* (without distortion)	Area m ²		
	≤ 0.01 - 0.13	0.131- 0.199	0.2 - 0.59
≤ 0.2 mm	disregard, if no accumulation **		
> 0.2 - ≤ 0.4 mm	1	2	2
> 0.4 - ≤ 2.0 mm	not permissible		1
> 2.0 mm	not permissible		

Surface imperfections (see Quality zone description)

Scratches*:

Width / mm	Length / mm	Area m ²			
		≤ 0.01 - 0.08	0.081 - 0.13	0.131 - 0.199	0.2 - 0.59
≤ 0.05	≤ 50.0	Disregard			
	> 50.0 – ≤ 80.0	not permissible			Disregard
> 0.05 – ≤ 0.10	≤ 30.0	1	2	4	5
	> 30.0 – ≤ 60.0	not permissible			2
> 0.10 – ≤ 0.15	≤ 5.0	1	2	4	5
	> 5.0 – ≤ 10.0	not permissible			2
> 0.15		not permissible			

Sleek (wiper mark)*: ignore

Accumulated small scratches, scuff marks *:

Defect size g*	Area m ²		
	≤ 0.01	0.011 – 0.199	0.2 – 0.99
≤ 0.6 mm	disregard, if no accumulation **		
> 0.6 - ≤ 1.5 mm	0	1	2
> 1.5 mm	not permissible		

Open bubbles:

- for not thermally toughened glasses: see No. 2.1 Inclusions
- for thermally toughened glass: not permissible

$$* g = \frac{\text{Length} + \text{Width}}{2}$$

** No accumulation permitted.

7 admissible defects, classified as „disregard“, within an inspection area of 40 mm diameter are considered as accumulation.

Glass specifications

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Edge defects

Edge chips

Product	Width / mm	Edge work	Evaluation
Single glass	≤ 1.0	Straight edge Cut edges (1)	Permissible
		Straight edge Cut and seamed edges (2)	
Single glass & Laminated glass	≤ 0.5	Straight edge Ground edges (with seam) (3)	Permissible
		Straight edge Half-round or C-edge (4)	
		Straight edge Bevelled edge (5)	
		Straight edge Polished edge (6)	
Laminated glass	≤ 3.0	Straight edge Cut edges (1)	Permissible
		Straight edge Cut and seamed edges (2)	

Edge chips (drilled holes): ≤ width of the seam are ignored
≤ 0.5 mm for unseamed holes are ignored

Edge crack

not permissible

Unprocessed shiny spots

Straight edge, edge work 3 to 6: not permissible

Coating defects

Interference points

Defect size g*	Area m ²					
	≤ 0.01	0.011 – 0.04	0.041 – 0.08	0.081 – 0.13	0.131 – 0.199	0.2 – 0.59
≤ 0.6 mm	Disregard, if no accumulation **					
> 0.6 - ≤ 1.3 mm	0	1	3	5	7	8
> 1.3 - ≤ 2.0 mm	Not permissible					1
> 2.0 mm	Not permissible					

For bigger dimensions the permissible number of defects has to be agreed upon separately.

Screen print: see drawing or customer requirements

Glass specifications

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Pinholes (for screen print):

Defect size g*	Permissible defects per 100 cm ² printed area
$g \leq 0.5 \text{ mm}$	Disregard, if no accumulation **
$0.5 \text{ mm} < g \leq 1.0 \text{ mm}$	3
$g > 1.0 \text{ mm}$	Not permissible

Repair of pinholes is permissible. The fixed defects must not be visible from the front.

Dirt (particles, lint) in the screen print

Dirt inclusions in the screen print will be disregarded if they are not visible from the front. For visible inclusions of dirt see No. 5.4 Pinholes.

Visual appearance

Dripping color may stay at the edge or the seam of the glass after screen printing.
A slight Moiré - effect may be caused by the mesh structure of the screen used for printing. These effects will be ignored.

Contamination

Stain: disregard, if wipeable

Roller marks: disregard

Marks of conveyer belt: to be agreed upon if necessary

Sucker mark: to be agreed upon if necessary

Water stains: disregard, if wipeable

Roller mark (after thermal toughening): to be agreed upon if necessary

Assembly defects

Inclusions in the compound laminate (bubbles/dirt/particles/lint...)

Defect size g*	Area m ²					
	≤ 0.01	0.011 – 0.04	0.041 – 0.08	0.081 – 0.13	0.131 – 0.199	0.2 – 0.59
≤ 0.2 mm	Disregard, if no accumulation **					
> 0.2 - ≤ 0.5 mm	0	1	2	3	3	Disregard, if no accumulation
> 0.5 - ≤ 1.0 mm	0	0	0	1	1	1
> 1.0 - ≤ 2.0 mm	0	0	0	0	0	0
> 2.0 mm	Not permissible					

Interlayer indent (for laminates)

Length of defect	Edge profile	Border area
l ≤ 3.0 mm	Straight edge, seamed	Disregard
l ≤ 0.5 mm	Straight edge, polished, C- grinding	Disregard

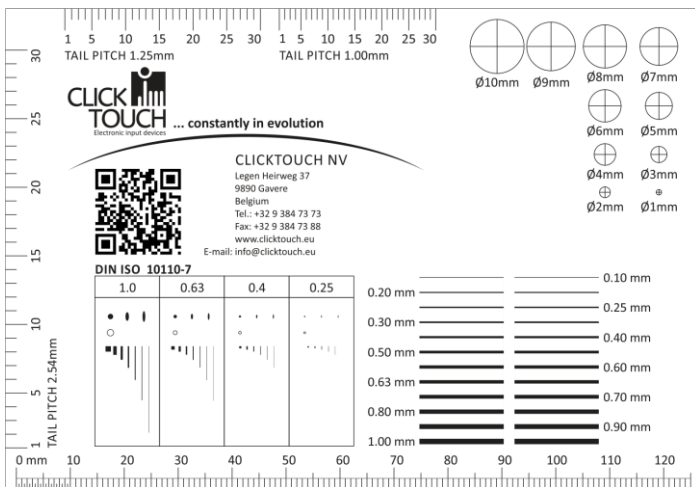
Foil overlaps are disregarded (can possibly be fixed manually)

Misalignment (for laminates) is included in the tolerance for length and width

Thermal properties

Glass with thicknesses > 4 mm can be thermally toughened

Control aid



Not to scale, original can be supplied on demand.