

TECHNICAL DELIVERY TERMS

TEGLA® NONFLEX

INTENTION

Overview of the quality requirements and specifications for etched flat glass products of the EuropTec GmbH (in the following EuropTec).

Determination of the exact criteria for the definition, classification and evaluation of quality characteristics associated with etched glass products.

SCOPE

The following technical delivery terms apply to single- and double-sided etched glass products of the brand **TEGLA® Nonflex**.

DEFINITIONS

Surface defects

Surface defects are local defects which change the visual quality of the glass. There are point defects and linear/elongated defects.

Surface defects are for example scratches, chips, chafe marks and punctiform etching defects. The designation for the number and size of surface defects is specified within ISO 10110-7.

Etching defects

Etching defects are areas with a, compared to the actual etching, modified etching structure.

Etching defects are for example bright (black) and dark (white) bands, unetched (blank) areas and defects due to acid inflow.

Glass defects

Glass defects are defects that result from the manufacturing process of the float glass.

Glass defects are local defects like bubbles, inclusions and tin spots as well as linear and elongated defects like drawmarks/-scratches and tin lines/-stains on the float side.

The conditions for evaluation of number and size of allowable glass defects are specified within DIN EN 572-2.

Defect sizes

The definition of defect sizes according to ISO 10110-7 is defect size [mm] = square root (defect length [mm] x defect width [mm]).

For example, the defect size 0,40 mm corresponds to a square of 0,40 mm edge length or a circle of 0,45 mm diameter.

Stock sheets and customized sizes

Stock sheets are dimensions, which are cut from (split) jumbo sizes for further processing at EUROPTEC.

Pre-cut sizes are dimensions, that are cut from (split) jumbo sizes or already further processed products on customers request.

GEOMETRY

Maximum Length and Width

Glass Thickness [mm]	Max. dimension [mm]
1,0/1,1/1,3	1.600 x 620
1,6	1.600 x 640
3,0/4,0/5,0/6,0	2.000 x 1.200

Tolerances for length and width dimension

Glass size	Glass thickness [mm]	Edge length [mm]	Tolerance [mm]
Pre-cut	1,0-3,15	≤ 1.000	±0,5
Pre-cut	1,0-3,15	> 1.000	±1,0
Pre-cut	4,0-6,0	all	±1,0
Stock sheet	1,0-6,0	all	±5,0

Further requirements in the tolerance of length and width dimensions have to be agreed on in individual cases.

Tolerances for glass thickness

Thickness [mm]	Tolerance [mm]	Thickness [mm]	Tolerance [mm]
1,0	+0,05/-0,15	3,0	+0,0/-0,3
1,1	+0,1/-0,2	3,15	+0,05/-0,15
1,3	+0,1/-0,2	4,0	+0,2/-0,3
1,6	+0,1/-0,2	5,0	+0,2/-0,3
2,0	+0,0/-0,3	6,0	+0,2/-0,3

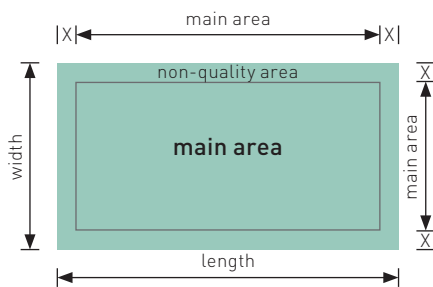
Measuring equipment Geometry

Characteristic	Measuring device
Length/width < 1000 mm	Calliper
Length/width ≥ 1000 mm	Tape measure
Thickness	Micrometer

SURFACE QUALITY

Edge zone for stock sheets

For stock sheets, surface and glass defects, rupture of corners as well as deviations of optical properties are unrestricted admissible within a circumferential edge zone of x mm (= Non-quality area) that is dependent on the gloss value.



GW - Gloss value 20°

Width of edge zone x

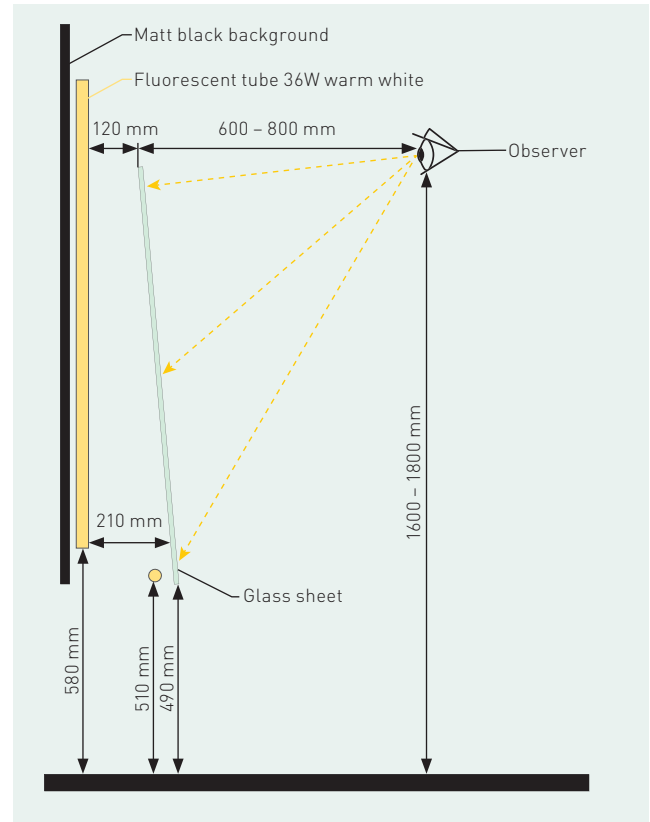
Nonflex 20 < GW ≤ 120	20 mm
Nonflex 4 < GW ≤ 20	30 mm
Nonflex 2 < GW ≤ 4	40 mm
Nonflex GW ≤ 2	60 mm

Conditions of evaluation

The inspection for surface and glass defects is performed under the following conditions:

	Description
Inspection equipment	Naked eye
Inspection in	Transmission
Lighting	Rear illumination with seven fluorescent tubes with a length of 1.200 mm (36 W, light temperature warm white), arranged side by side at a distance of 260 mm in front of a black background at the washing machine outlet.
Incidence angle of light	85° - 90° to the evaluating area
Evaluation side	Blank or etched side
Evaluation angle	40° - 90° to the evaluating surface
Evaluation time	The inspection time for the entire area is about ten seconds.
Evaluation distance	600 - 800 mm from the glass surface

Schematic test assembly



Etching defects

All errors and discrepancies, which are not identified within the stated evaluation time according to the conditions given above and, are to be ignored.

Surface defects

The following numbers and sizes of surface defects are permitted in the main area of stock sheets and on the whole area for pre-cut sizes:

Area A [m ²]	Permissible Point defects Max. number x max. defect size [mm]	Permissible scratch-es Max. number x max. scratch width [mm] / cumulated length [mm]
A < 1,0	4 x 1,0	4 x 0,10/20
1,0 ≤ A < 1,6	6 x 1,0	6 x 0,10/30
A ≥ 1,6	8 x 1,0	8 x 0,10/40

- Defect sizes ≤ 0,40 mm are not regarded
- Point defects and scratches are cumulative, i. e. point defects and scratches are allowed together
- No accumulation of surface defects allowed, definition according to ISO 10110-7
- Removable residues (dust, paper marks, etc.) will not be considered as a defect

Further demands on surface quality have to be agreed on in individual cases.

Edge defects

For pre-cut sizes, edge damages of a maximum length x width x depth of 2 mm x 1 mm x 1/3 glass thickness are permitted. Fracture causing edge defects are not permitted.

PROPERTIES

Gloss measurement

For the measurement of the gloss values, EUROPTEC uses only measurement devices of the type BYK micro-TRI-gloss of the production series 4446 i. e. 4560. The measurement can be performed under an angle of 20°, 60° or 85° (measurement device geometry).¹

For the gloss measurement, the glass sheet has to be placed on a black, non-reflectant background (black felt) with the etched side facing frontwards. The measurement device is placed on the glass at an angle of 45° to the outer edges inside the main area.

¹If using other measurement devices, there can be distinct deviations in the measured gloss values.

Tolerances gloss values

GW - Gloss value 20°	Tolerance in main area
GW 20-120	±10
GW < 20	±5,0
GW 4,0*	±2,0
GW 1,5*	±1,0

* only for glass width up to 620 mm

Further demands on gloss values and their tolerances have to be agreed on in individual cases and may lead to a widening of the non-quality edge zone.

Further optical characteristics

Besides the gloss values, further optical and mechanical parameters (like roughness, haze, clarity, transmission, sparkling) can be determined on customers demand.

Based on the raw materials, glass products have characteristic colours, these become more evident with increasing glass thickness. Therefore different colour appearance is possible for same products.

WARRANTY

In case of a warranty claim, please pay attention to point 12. of our General Terms and Conditions of Sale and Delivery.

Return of rejected goods

For the assessment of rejected goods, EUROPTEC can request the entire disputed goods from the customer. The redelivery costs go at the expense of EUROPTEC. The customer has to ensure proper packaging so that goods may not be damaged on the backhaul. Unauthorized complaints will be returned to the customer and partial transportation and sorting costs will be invoiced.

Storage conditions

The transport and storage of refined glass products have to be done properly, as is common in the glass industry. This includes in particular the prevention of moisture and temperature changes. EUROPTEC is not liable for damages caused by improper transportation or storage.

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