



**Technical Data Sheet**  
**Matelux**

**08/2014**

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# 1 INTRODUCTION

This Technical Datasheet gives information about the range of acid etched glass Matelux (except Arctic White). The substrate of Matelux is a float in accordance with EN 572-2.

## 2 NORMATIVE REFERENCES

There is not yet a published EN standard.

All Matelux are produced in factories being ISO 9001 certified.

## 3 COMPOSITION AND PROPERTIES OF THE GLASS

The basis glass used for Matelux production is float glass conform to EN 572-1 & 2. The properties of the float glass are listed hereunder.

### 3.1 CHEMICAL COMPOSITION

The EN 572-1 defines the magnitude of the proportions by mass of the principal constituents of float glass is as following.

SiO <sub>2</sub>	69 to 74 %
Na <sub>2</sub> O	10 to 16 %
CaO	5 to 14 %
MgO	0 to 6 %
Al <sub>2</sub> O <sub>3</sub>	0 to 3 %
Others	0 to 5 %

### **3.2 MECHANICAL PROPERTIES**

- Weight (at 18°C):  $\rho = 2\,500 \text{ kg/m}^3$
- Density: 2,5
- Young's Modulus (modulus of Elasticity):  $E = 70\,000 \text{ N/mm}^2$
- Poisson Ratio:  $\mu = 0,2$
- Shear Modulus:  $G = E / [2 (1+\nu)] \approx 29\,166 \text{ N/mm}^2$
- Knoop Hardness: 6 GPa
- Mohs Hardness: 6
- Characteristic bending strength:  $45 \text{ N/mm}^2$

### **3.3 THERMAL PROPERTIES**

- Softening point:  $\approx 600 \text{ }^\circ\text{C}$
- Fusion temperature:  $\approx 1500 \text{ }^\circ\text{C}$
- Linear expansion coefficient:  $\alpha = 9 \cdot 10^{-6} / \text{K}$  (between  $20^\circ$  and  $300^\circ$ )
- Specific heat capacity:  $C = 720 \text{ J/(kg.K)}$
- Emissivity of glass without coating:
  - Normal emissivity  $\varepsilon_n = 0,89$
  - Corrected emissivity  $\varepsilon = 0,837$

### **3.4 OPTICAL PROPERTIES**

- Refractive index N to visible radiation (380 to 780 nm):
  - air/glass: 0,67
  - glass/air: 1,50

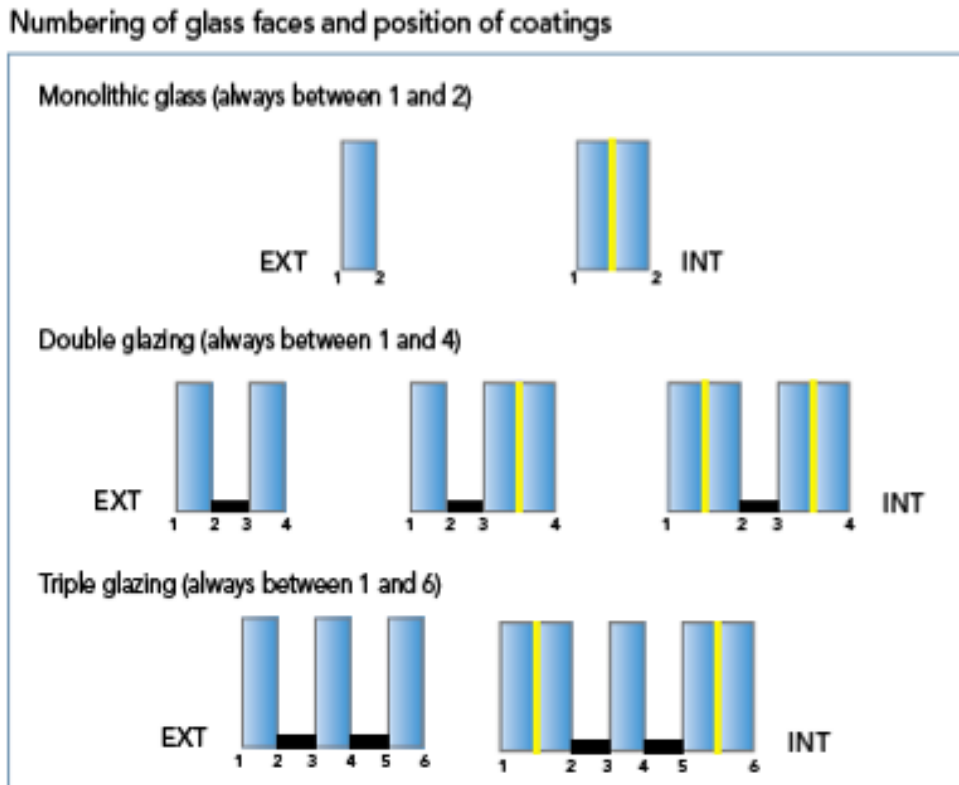
### **3.5 ELECTRICAL PROPERTIES**

- Specific resistance:  $5 \cdot 10^7 \text{ } \Omega \cdot \text{m}$  at 1 000 Hz and  $25^\circ\text{C}$
- Dielectric constant: 7,6 at 1 000 Hz and  $25^\circ\text{C}$

# 4 LIGHT, SOLAR AND THERMAL PROPERTIES

## 4.1 CONVENTION FOR ACID ETCHED POSITION

The following conventions are used for the numbering of the glass faces and the position of the coating.

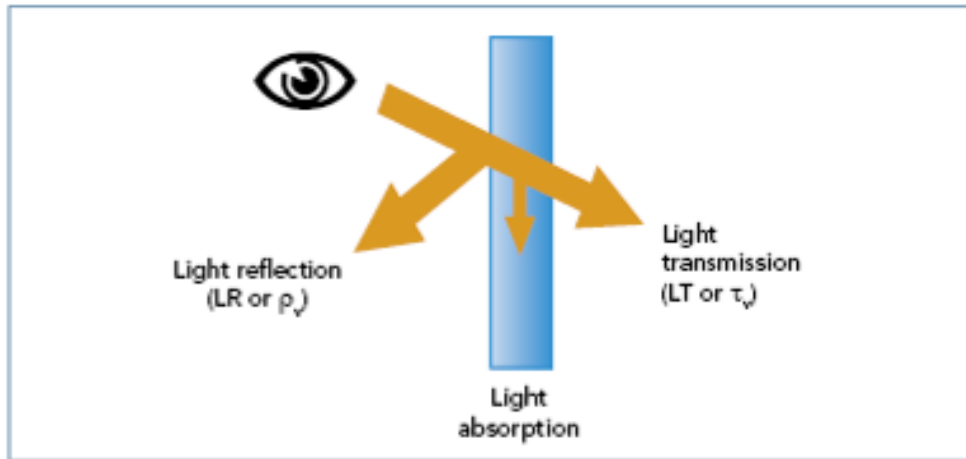


## 4.2 LIGHT AND SOLAR PROPERTIES

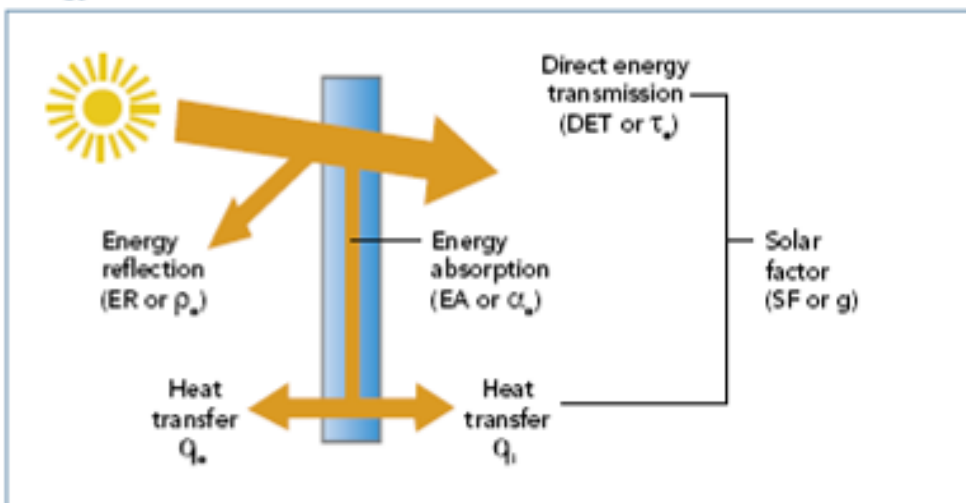
The light and solar properties are calculated using spectral measurement that conforms with standards EN 410 and WIS/WINDAT. The following properties are given:

- LT ( $\tau_v$ ): Light transmission
- LR ( $\rho_v$ ): Light reflection on coating side
- LR' ( $\rho'_v$ ): Light reflection on glass side
- DET ( $\tau_e$ ): Direct energy transmission
- ER ( $\rho_e$ ): Energy reflection on coating side
- ER' ( $\rho'_e$ ): Energy reflection on glass side
- EA ( $\alpha_e$ ): Energy absorption
- SF (g): Solar factor
- SC: Shading coefficient

### Light factors



### Energy factors



## 4.3 THERMAL PROPERTIES

The thermal transmittance  $U_g$  ( $\text{W}/\text{m}^2\text{K}$ ) is calculated according EN 673. The emissivity measurement complies with EN 673 and EN 12898.

Matelux products have normal emissivity as float glass.

## 4.4 PERFORMANCES OF MATELUX PRODUCTS

The tables with performances are available on [www.agc-yourglass.com](http://www.agc-yourglass.com) from the Glass Configurator tool and list the light, solar and thermal properties of the Matelux products.

## 5 ACOUSTIC PROPERTIES

The acoustic properties of Matelux are the same as those of Planibel (see table).

	<b>R<sub>w</sub> (C, C<sub>tr</sub>)</b>	<b>R<sub>w</sub> + C</b>	<b>R<sub>w</sub> + C<sub>tr</sub></b>
<b>3 mm</b>	29 (-2, -5)	27	24
<b>4 mm</b>	30 (-2, -4)	28	26
<b>5 mm</b>	30 (-1, -2)	29	28
<b>6 mm</b>	31 (-2, -3)	29	28
<b>8 mm</b>	32 (-1, -2)	31	30
<b>10 mm</b>	34 (-2, -3)	32	31
<b>12 mm</b>	35 (-2, -3)	33	32

## 6 OTHER PHYSICAL PROPERTIES

### 6.1 RESISTANCE TO THERMAL SHOCK

The application of the surface finish does not affect the thermal durability of the substrate. Matelux has the same resistance to thermal shock as that of its substrate.

### 6.2 MECHANICAL STRENGTH

For acid etched glass manufactured on float glass, coated glass, thermally toughened glass or laminated glass, the same value of mechanical strength shall be used as for the glass substrate.

# 7 TOLERANCES ON DIMENSIONS

## 7.1 THICKNESS

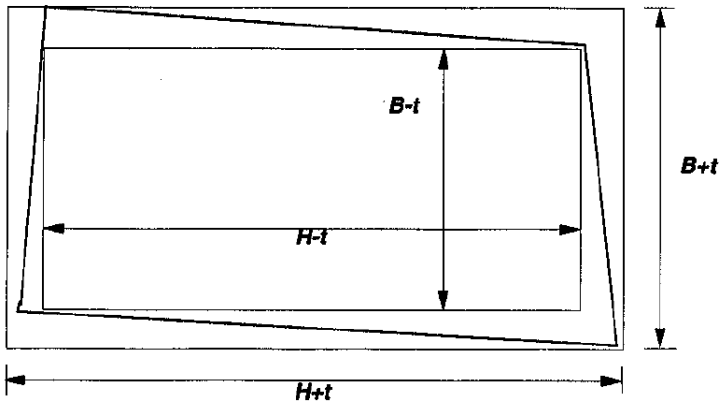
The actual thickness shall be the average of for measurements, taken to the nearest 0,01 mm, one taken at the center of each side.

The actual thickness rounded to the nearest 0,1mm shall not vary from the nominal thickness by more than the tolerances shown in the table.

	Minimum (mm)	Maximum (mm)
<b>3</b>	2,8	3,2
<b>3,15</b>	3,0	3,2
<b>4</b>	3,8	4,2
<b>5</b>	4,8	5,2
<b>6</b>	5,8	6,2
<b>8</b>	7,7	8,3
<b>10</b>	9,7	10,3
<b>12</b>	11,7	12,3
<b>15</b>	14,5	15,5
<b>19</b>	18,0	20,0

## 7.2 LENGTH AND WIDTH

The tolerances  $t$  on nominal dimensions length  $H$  and width  $B$  are respectively  $\pm 3$  mm and  $\pm 2$  mm.



The limit of squareness is described by the difference between diagonals. The difference is maximum 5 mm.



# 8 QUALITY REQUIREMENTS

## 8.1 GENERAL

The quality of acid etched glass can be affected by defects, which alter the appearance of the transmitted image of objects. Such alteration of the image can result from punctual and linear defects and defects in the glass. The defects are detected visually by an observation of the processed glass in transmission.

Note. The requirements for visual appearance of acid etched glass apply to the glass as manufactured. They do not take into account any defects introduced during subsequent processing (e.g. toughening, laminating, fabrication into insulating glass unit, etc.), transportation or installation.

## 8.2 DEFINITIONS

- **Uniformity defects:** Slight visible variation in haze effect within a pane or from pane to pane. Defects associated with a non processed zone or with a different processed intensity zone (e.g. clouds)
- **Punctual defects:** punctual disturbance of the visual translucence looking through the processed glass. It may be due to cutting oil droplets, silicone pollution etc
- **Linear defects:** scratches, extended punctual defects etc
- **Edge defects:** defects that affect the as-cut edge of the processed glass. They can include entrant/emergent defects, shelling, corners on/off and vents
- **Cluster:** group of not less than three spot defects, separated by not more than 50 mm.

## 8.3 METHOD OF OBSERVATION AND MEASUREMENTS

### 8.3.1 OBSERVATION

The processed glass shall be observed in a vertical position, with the naked eye and under normal diffused lighting conditions, (natural daylight or simulated daylight, between 300 Lux and 600 Lux at the processed glass), from a distance of minimum 50 cm. The direction of observation is normal, i.e. at right angles, to the processed glass.

The use of an additional lighting source, e.g. spotlight, is not allowed.

## 8.3.2 UNIFORMITY DEFECTS

Under the conditions of examination given in §8.3.1, record any defects.

## 8.3.3 PUNTUAL AND LINEAR DEFECTS

Surface defects are assessed using the method in §8.3.1. The dimension and number of punctual and linear defects which cause disturbance to vision shall be noted.

## 8.4 ACCEPTANCE LEVELS

The acceptance levels for surface defects are given in table for stock sizes. These defects refer to the acid etched surface only.

Punctual faults (mm)	Max/10 m <sup>2</sup>
≤ 0,5	Accepted <sup>a</sup>
> 0,5 and ≤ 1	5
>1 and ≤ 2	2
> 2	0
<sup>a</sup> Accepted, providing there is no accumulation	

## 8.5 ASPECT AND COLOUR OF THE ETCHING

### 8.5.1 INTRODUCTION

The aspect of the etching is defined by the color measurement.

The color measurement is defined by L\*, a\* and b\* values (illuminant D65, 10°).

The difference of color between 2 samples is calculated by

$$\Delta E^* = \sqrt{(L_1^* - L_2^*)^2 + (a_1^* - a_2^*)^2 + (b_1^* - b_2^*)^2}$$

### 8.5.2 MEASUREMENT OF THE $\Delta E^*$

The  $\Delta E^*$  should be measured on the glass side, according to CIE Publication N° 15: DELTA E CIE LAB D65 10° SCI.

### 8.5.3 ACCEPTANCE LEVELS

The allowable variation of the colorimetric measurements, measured on the acid etched side, between panes (from the same thickness) shall be:

$$\Delta E^* \leq 2$$

Note 1: In order to avoid color difference coming from deviation from batch to batch, panes placed next to each other should ideally come from the same production batch

### 8.6 EDGE FAULTS

#### 8.6.1 INSPECTION METHOD

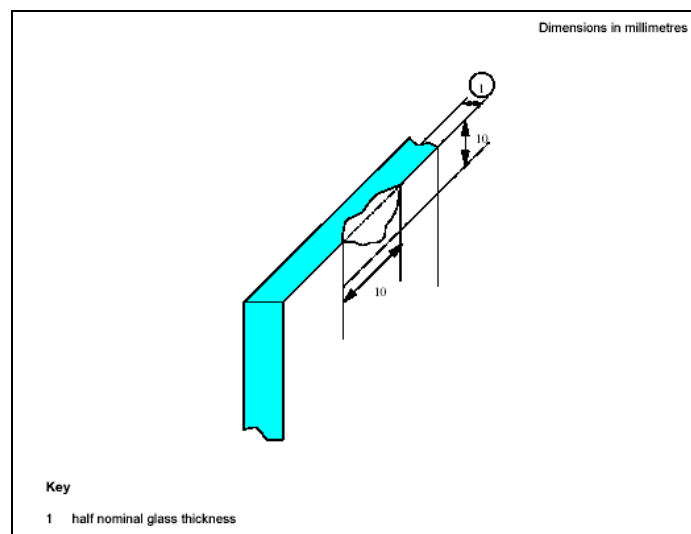
Same as §8.3.1.

#### 8.6.2 ACCEPTATION LEVELS

The edge quality of stock acid etched glass can be affected by the presence of entrant/emergent faults and shelling. Using the method of §8.3.1, the edges of the acid etched glass shall be checked for the presence of shells, corners on/off and edge vents.

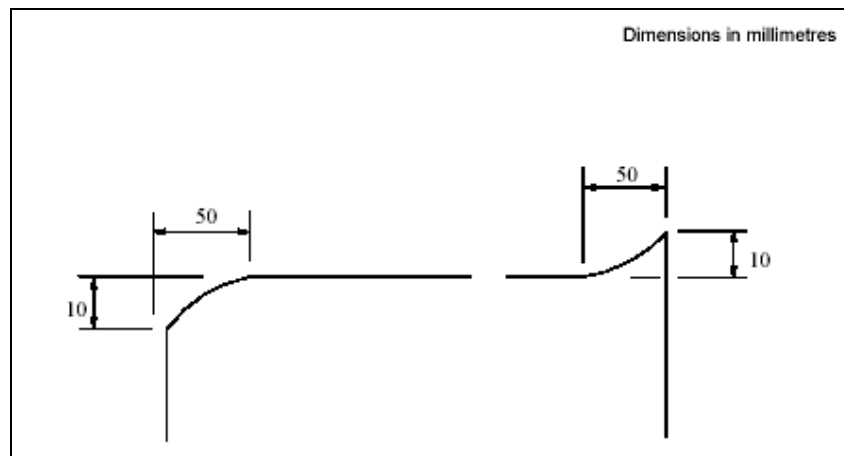
##### 8.6.2.1 CHIPS OR SHELLS

For stock sizes, entrant or emergent chips or shells shall be accepted provided they do not exceed a maximum length and depth of 10 mm and half the nominal glass thickness.



### 8.6.2.2 CORNERS ON/OFF

For stock sizes occasional corners on/off shall be allowed. No more than 5 % of the sheets on a delivery shall be affected.



### 8.6.2.3 VENTED (CRACKED) EDGES

Vented (cracked) edges shall not be allowed for stock size.

## 9 OTHER RELATED DOCUMENTS

Following documents are also available from [www.agc-yourglass.com](http://www.agc-yourglass.com):

- Processing Guide
- Cleaning and Maintenance Guide for Façade glazing
- Cleaning and Maintenance Guide for Decorative glazing
- Glazing Instructions – Traditional Setting