



**Handling and processing instructions for laminated glass and laminated safety glass from the Eurolamex® product family according to PN-EN ISO 12543 produced by:**

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**These handling and processing instructions for laminated glass and laminated safety glass apply to the following products:**

**Eurolamex® Clear  
Eurolamex® Matt  
Eurolamex® Phon**

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### **2.3. Packaging**

Packages are usually sent without additional packaging. However, there are possibilities to protect the packages with foil, in particular in the case of international and sea shipments, to limit the influence of humidity and prevent glass corrosion.

### **2.4. Separating of packages**

Packages usually weigh 2.5t or 5t. They are separated by spacers for enable remove them from the rack with a suitable frame or forklift. These spacers are made of recyclable material and can be returned to Euroglas after prior agreement.

### **2.5. Separation of sheets within a package**

A layer of separating powder is placed between individual sheets. This powder serves to prevent contact and sticking between the glass and to separate individual sheets.

### **2.6. Delivery on site**

The customer must ensure a flat and free of other objects that ground, onto which the L or A racks are to be placed. For safety reasons, the offloaded rack must not wobble or exhibit an inclination where the packages are positioned more than 87° to the horizontal.

### **2.7. Inspection of delivery on site**

The customer must carry out a visual inspection of the delivered glass before unpacking the individual packages. It aims to capture obvious defects that may arise in transport (cracks, moisture inside the package, flooding, incorrect amount of panes in the package, or the delivery of the wrong product).

Defects found on delivery must always be recorded on the consignment note (CMR) in the presence of the driver and signed by him.

If defects in the delivered order are noticed, the signed waybill (CMR) must be sent to Euroglas in accordance with the General Terms of Sale.

Claims for damage arising during and after processing will not be included. Therefore, the customer should ensure that the production process is adapted to glass processing, and the quality control staff are properly trained to detect possible quality problems as soon as possible.

In the case of complaints, samples of the advertised glass will be required.

## 2.8. Unloading of packages

The unloading of packages must be carried out by properly trained personnel, in compliance with health and safety regulations. Only use appropriate devices that comply with the applicable regulations.

The supports on which the glass is placed must be free of dirt, e.g. glass fragments.

## 2.9. Storage of the packages

The place and method of storage has a huge impact on the subsequent processing of laminated glass and of laminated safety glass. It is important that the supports are at the same level. The edges of the glass must lie evenly on several support points so that the glass is free of stress.

If the supports are inclined differently or have different heights, or the support surface is unevenly worn on one side, stresses are induced in the glass, which are noticeable in the glass cutting process through the increased tendency to crack glass during cutting.

Glass packages must be stored at an angle between 87 ° and 83 ° to the ground.

For safety reasons, the glass packet can never be stored vertically or horizontally.

The storage location must be equipped with at least two stable supports that will not damage the edges of the glass.

In order to keep the spacing between packages, the delivered spacers can be used, they should be placed in the same places on the package as in the delivery of glass.

Make sure that the packages are not exposed to direct sunlight at the place of storage, which can lead to thermal cracks.

The storage location for the supplied glass should be in a closed building.

Glass is a fragile material and it shows that the colder it is, the more fragile it is, and the warmer it is, the softer it is. The foil has similar properties, but in a different temperature range.

Laminated glass and laminated safety glass transported in trucks assume the ambient temperature during transport. In extreme cases, glass loads may have a temperature on transport of minus 20°C to plus 60°C. Acclimatization of glass to the temperature in the glass warehouse may take up to several days!

The glass manufacturer does not choose a specific processing temperature, however the processing temperature above 20°C has a positive effect on the subsequent cutting process.

Freshly delivered glass should acclimatize in the raw material warehouse for 2-3 days.

In this way, the temperature during the glass cutting process can be kept constant.

Humidity and air temperature also affect the properties of the film.  
The storage space must be dry and the humidity must not exceed 60%.  
The air temperature should be stable enough to avoid reaching the dew point.  
We recommend a temperature above 18°C.

Chemicals may not be used near the glass storage area. Our experience shows that, for example: caustic soda or hydrofluoric acid can even from a considerable distance damage glass.

Apart from a time of delivery on site, glass must not be stored on the open air.  
Storage location must be away from gates or doors to prevent cold draughts .

Stock management should be done on the FIFO principle.

### 3. Durability

If all previous points have been met in accordance with the requirements, the shelf life of the products at the customer from the day of delivery by our carrier is:

- to EU countries not requiring sea transport:
  - open or unpacked packages: 6 months
- outside the EU and countries requiring sea transport - to be individually agreed between the client and Euroglas

Euroglas assumes no responsibility for the arising of delamination as a result of glass installation in a humid environment where it is exposed to water and in an environment with an average air humidity above 70%.

Extreme weather conditions (excessive heat, cold, UV radiation), glass processing can have an adverse effect on keep adhesion.

### 4. Handling

To avoid traces of suction cups on the surface when using them, appropriate and clean suction cup pads are required.

The suction cups usually contain a softening substance that can leave marks on the surface. Thanks to the appropriate overlays you can prevent them or possibly significantly reduce traces.

If the vacuum suction cups are too little or are not levelled correctly, middle stresses arise when lifting the sheet.

A device with suction cups spaced so as to distribute the lifting forces over the entire surface of the glass is preferred.

In the case of automatic loading devices, it must be ensured in advance that they have a sufficiently large number of vacuum suction arms to better distribute the forces over the entire glass surface.

During all work with glass one must adhere to the principles of occupational health and safety in accordance with applicable regulations.

#### **4.1. Manual downloading of glass panels from a package**

The suction frame used must be positioned so that it approaches the package centrally. Its height should be adjusted so that the glass angle changes so that it reaches about 90 ° during transport.

Be careful not to pull the whole package! You can move the pane slightly at the edges so that air gets between the glass and the removable pane detaches, so you can lift it.

Avoid lifting the glass up with the sheets joined and attempting to detach it from the package at a later time. Doing so may lead to the appearance of scratches.

#### **4.2. Automatic downloading of glass panels from a package**

With automatic removal it is necessary to check of cycle, especially at the first delivery, for example: the time needed to separate the sheet from the packet (and the time the air is blown through the edge diffusers if the device is equipped with such a system).

Even if the panes are separated by a separator, the separation of the panes can be different for different suppliers.

Also with automatic downloading there is a rule that we first separate the pane from the next and then remove it. Avoid sliding the glass over the glass. Scratches will appear on the surface.

### **5. Glass cutting**

During all work with glass adhere to the principles of occupational health and safety in accordance with applicable regulations and instructions.

There must be no filings of glass or other debris on the cutting table.

In case of intend to execute operations not included in this document, they must be reported by the Customer to our sales representative before placing the order.

All applications not described in the study regarding the processing of glass from the Eurolamex® product family must be tested before they are implemented in the processing of our product. In the event of a negative test result, Euroglas shall not be liable for losses incurred by the customer during production.

### **5.1. Cutting (recommendations)**

Laminated glass and safety laminated glass can be cut and broken like Eurofloat® type glass. However, it should be noted that the cut must be made in parallel on both sides of the glass (top and bottom).

Before making the first cut, check the parameters because they depend on the thickness, type of glass and the table used.

Due to the special properties of laminated glass, a number of factors must be considered when processing this material.

The systems and tools used during cutting play a key role in achieving the best results.

Important elements are the cutting wheel, breaking roll and blade for cutting the foil. They must be optimally matched.

Only regular and proper maintenance of individual elements will allow you to properly cut laminated glass and laminated safety glass.

The cutting wheel is an important part of the process.

Uninterrupted cutting is a prerequisite for proper breaking of the glass.

By cutting the glass surface with a cutting wheel, stresses are introduced. Manual or automatic bending of the glass causes controlled cracking and breaking of the glass.

To be able to cut glass of different thicknesses and coatings, the cutting wheel must have an optimal angle. Only when the angle of the circle is perfectly fitted to the glass can the best breaking quality be obtained.

When cutting glass, it is very important to properly adjust the angle of the cutting wheel and its pressure on the glass. This allows you to get a good "glass outline" that looks like a delicate, silvery thread.

Excessive pressure applied to the cutting wheel increases the risk of glass splinters or blockage and damage.

In this case, the cut edge has a rough pattern with irregularities.

Not only the pressure force, but also the head feed speed are important for a good cut. In general, it is better to cut at a higher speed, as this reduces the cutting pressure and allows you to choose a smaller angle of the cutting wheel. This in turn has a positive effect on stresses along the cut in the glass and results in better cracking quality.

Should be used cutting wheels with the smallest possible diameter because when combined with the cutting speed they reduce the cutting force.

The angle of the cutting wheel must be determined according to the thickness of the glass.

The cutting wheel geometry creates a force that creates tension in the glass.

The more blunt the circle angle, the greater the voltage builds up.

Since the cutter wheels are a consumable item, you must check their condition regularly.

Many cutting systems are equipped with an automatic wear registration system for each cutting wheel and indicate when it may be necessary to replace it with a new one (after earlier verifying the lifetime for each wheel and adjusting the optimal cutting parameters).

To prevent splitting of the incision (scratch), use the right amount of glass oil and optimally select the cutting wheel angle.

Micro cracks formed during cutting tend to increase again or the so-called "skin over".

The oil used fills the micro cracks and prevents this process. As a result, the glass is broken properly using much less force and energy.

Use as little oil as possible for the cut, but enough to prevent the cut from drying out until the glass is broken.

The cutting oil also ensures proper lubrication, joining glass fragments and better breaking results.

We recommend cutting oil with fast evaporation properties (suitable for low-E coating).

The choice of oil depends on the cutting process.

Parameters such as force of cutting pressure, cutting speed and acceleration, time and power of heaters, parameters of sheet separation should also be adapted to the type of glass.

Here are some basic cutting rules:

The thinner the glass,

- the sharper the angle ( $135^{\circ}$  -  $90^{\circ}$ ),
- the lower the force of cutting pressure (60N - 10N),
- the thinner and more delicate the cut.

The thicker the glass,

- the more obtuse the angle (135 ° - 165 °),
- the higher the force of cutting pressure (60N - 250N),
- the thicker and more jagged cut

In the next stage of the glass cutting process, a breaking roll or other breaking system is used (depending on the supplier of the device).

The breaking roll is located directly on the rear cutting head. After cutting the glass, it is placed on the cutting edge with some pressure, allowing the laminated glass to break.

When the breaking roll is guided along the cutting of the upper sheet of laminated glass, the lower glass is broken, while when it runs along the cutting of the lower sheet, the upper glass is broken.

The correct geometry of the breaking roll is particularly important, as it must move exactly over the edge of the glass breakage.

In many cutting systems, instead of a break roll, break bars are used. In this solution, it is important to level the breaking element and its surface condition.

In some cutting systems, an alternative solution is used to break the cut glass panes by applying a vertical movement of the table. When moving up from level 0, the bottom sheet is broken, while when moving down from level 0, the top sheet is broken.

In the next stage belongs cut the PVB foil connecting the multilayer glass. For this purpose, a blade is used to cut the foil.

It is especially important that the foil cutting blade is very sharp, no damage of the surface, which prevents tearing off the foil and the so-called "Delamination" or damage to the edges of the glass.

The sequence and parameters of the sheet separation cycle should be adapted to the thickness of the glass and the type of PVB film.

To achieve the best results when cutting laminated glass and laminated safety glass, ensure that all components are optimally matched to each application and properly maintained. This means that the cutting wheels and foil cutting blades must always be sharp and kept in good condition, and the break roll or slat must have the right geometry.

Glass fragments that get on the glass after it has been broken should be removed. Leaving them will scratch the glass surface.

**Note:** Glasses from different suppliers may require separate cutting process parameters.

### 5.1.1. Force of cutting pressure

The force of cutting pressure should be checked regularly directly at the cutting wheel. Use a suitable pressure gauge here.

### 5.1.2. Specification of cutting parameters

Table 1. Proposed cutting parameters:

Glass thickness	Cutting wheel angle	Pressure - force of cutting pressure the upper head	Pressure - force of cutting pressure the lower head
4.x mm	135°	25 N - 30 N	25 N - 30 N
6.x mm	145°	40 N	40 N
8.x mm	145°	45 N	45 N
10.x mm	145°	50 N	50 N
12.x mm	145° – 155°	55 N – 60 N	55 N – 60 N
16.x mm	155°	65 N – 75 N	65 N – 75 N
20.x mm	155°	90 N – 100N	90 N – 100N

The above cutting parameters are the initial suggestions and must be adapted to each cutting system.

## 6. Putting off cut-out pieces

If the cut pieces are not automatically / directly transported to the next stages of processing, we recommend that you do not stack many sheets of one optimization in stacks, the sheets should always be stored and transported individually.

### 6.1. String / comb stand

It should be noted that in the spaces between individual partitions (usually there are placed / applied sheathed cables / steel rods), there are no protruding elements, inclusions of foreign bodies and glass filings. Guards should be checked regularly for damage and replaced if necessary.

It is important that the glass surface does not come into contact with the guards during loading

or unloading (risk of scratching).

## **6.2. Stand A or L (internal transport)**

When placing on type A or L stands intended for internal transport, pay attention to the following:

After put away, the sheets must not be moved. If you need to move later, you must first separate the sheets and then move them separately.

The sheets must adhere firmly to the stands and must not wobble. Appropriate roll-over protection should be used here, the clamping force should not be greater than necessary.

## **7. Temporary storage**

Make sure that at the storage place, the glass is not exposed to direct sunlight, which can lead to thermal cracks.

The climatic conditions of temporary storage are suitable as for the raw material warehouse. The storage space must be dry and the air humidity must not exceed 60%, the air temperature should be stable enough to avoid reaching the dew point. We recommend a temperature above 18 ° C.

Chemicals may not be used near the glass storage area. Our experience shows that, for example, caustic soda or hydrofluoric acid can, even from a considerable distance, damage glass.

## **8. Treatment**

### **8.1. Dry edge machining**

The edges of the glass sheets can be processed using a grinding machine using the dry method. Make sure that the sanding dust is completely removed (aspirated) from the glass surface.

Residues of dust and glass particles can cause scratches during the further processing of the glass, in addition, it can deposit on the brushes in the washer and cause scratches.

## 8.2. Wet edge machining

When using a grinding machine working with water, make sure that the entire surface of the glass being processed is wetted. The glass surface must remain wet until the sheet undergoes a washing process. Under no circumstances should it be allowed to dry, it may lead to stains on the surface that will not be removed during the washing process. If this edge treatment method is used, the sheet should go directly to the washer after processing. The best solution is when the devices are connected to each other.

## 8.3. Washing after edge treatment

Processed glass must undergo a washing process immediately after processing the edge, the ideal solution is a washer connected to the edge processing device. Make sure that no residue from the previous process has dried on the glass surface before starting the washing process. In addition, before contact with the brushes in the washer, the sheet must be rinsed with enough water to remove the residue of fine glass dust from the grinding process.

The washer, especially all brushes must be clean. Wash with softened water. In the last, and if possible also in the penultimate washing zone water should meet the following requirements:

- Conductivity <30 Microsiemens
- Recommended temperature 30 - 45 ° C
- No additional cleaning agents
- pH value of 6.0 - 8.0

Warning! Transporting the washer should not stop during glass washing, otherwise the glass surface may be damaged by the brushes.

A permanent service plan is recommended for the washing machine, the washer must be cleaned regularly.

In addition, it is important to check the brush length. For rarely machining larger dimensions, the length of the bristles may show large differences. It should then be reduced to an even length.

In the pre-wash area and in the main wash area use soft brushes that have been defined by the washer manufacturer as brushes for laminated glass.

Make sure the minimum bristle length recommended by the brush manufacturer and prevent this value from being exceeded.

The process of drying pieces must be carried out using an air knife.

The air used in it must be filtered (care must be taken about the condition and quality of the filters in the installation). It is unacceptable that wet traces remain on the surface of the sheet after the drying process.

Depending on the environmental conditions there may be a biological contamination of the washer.

This can be seen from the discoloration of the rollers. This may also be indicated by slippery deposits on the walls.

This can be prevented by using an appropriate biocide. Then you can rinse the washer with a suitable chemical and thus improve the ambient conditions.

Before such an operation please check with the manufacturer of the washer as well as the water treatment manufacturer if such an operation can be carried out.

Euroglas is not liable for any damages resulting from this.

#### **8.4. Transport of treated and washed glass**

Dedicated clean and dry gloves should be used for all operations with Eurolamex® glass.

Hygiene measures should be observed when working with glass and work safety in accordance with applicable regulations and instructions.

Small pieces should not be stored lying down, this may cause scratches, pieces should be put away one at a time.

If frames with suction cups are used to transport glass clean and fitted suction cup covers should be used to reduce the possibility of suction cup marks on the surface.

When transporting larger sheets we recommend using a glass clamp.

When the glass sheet is putting away it must not come into direct contact with the glass that has already been put aside, this may scratch the surface, to avoid this, appropriate separators should be used to separate the glass panes.

We recommend performing a quality check after this processing step.

#### **9. Stage quality control**

Assessment of faults and defects in laminated glass and laminated safety glass is carried out in accordance with PN-EN ISO 12543-6.

#### **10. Insulated glass production**

During all work with glass adhere to the principles of occupational health and safety in accordance with applicable regulations and instructions.

## **10.1. Laying glass on the IGU production line**

### **10.1.1. Lining out pieces from a comb / string stand**

Contact of the glass surface with the stand elements should be kept to a minimum.

### **10.1.2. Lining out forms from stand A or L**

When removing glass from stand A or L (stands intended for internal transport), first tilt the sheet from the batch and only then remove it from the stand. Avoid pulling the sheet up after the next sheet. Also, be careful not to pull the sheet from inside, this will damage the surface.

## **10.2. Washing**

The washer, especially all brushes must be clean. Wash with softened water.

In the pre-washing area and in the main washing area use soft brushes that have been defined by the washer manufacturer as brushes for laminated glass. If this is not the case, the brushes should be raised (in this case the washing result may be worse).

Make sure the minimum bristle length recommended by the brush manufacturer and prevent this value from being exceeded.

Warning! The transport should not be stopped during washing.

## **11. Product quality**

### **11.1. Recommendations**

For customers who process laminated glass or laminated safety glass for the first time, we recommend checking the pieces after each stage of production. This enables early detection of faults and defects. Staff should be properly trained.

Acceptance criteria for defects and defects for laminated glass and laminated safety glass in accordance with PN-EN ISO 12543-6.

### **11.2. Quality control**

The evaluation of laminated glass and laminated safety glass errors is carried out in accordance with PN-EN ISO 12543-6.

### 11.2.1. Specification according to PN-EN ISO 12543-6

Laminated glass and laminated safety glass should be verified in storage sizes or in sizes adapted to assembly.

The tested glass sheet is viewed from a distance of at least 2m.

Table 2. Number of permissible in the vision area

Area of pane m <sup>2</sup>	Number of permissible defects > 30mm in length <sup>a</sup>
≤5	not allowed
5 - 8	1
>8	2
<sup>a</sup> linear defects less than 30mm in length are allowed	

Table 3. Permissible spot defects in the vision area

Size of defect d mm		0,5 < d ≤ 1,0	1,0 < d ≤ 3,0			
			A ≤ 1,0	1,0 < A ≤ 2,0	2,0 < A ≤ 8,0	A > 8
Size of pane A m <sup>2</sup>		For all sizes				
Number or density of permissible defects	2 panes	No limitation, however, no accumulation of defects	1	2	1/m <sup>2</sup>	1,2/m <sup>2</sup>
	3 panes		2	3	1,5/m <sup>2</sup>	1,8m <sup>2</sup>
	4 panes		3	4	2/m <sup>2</sup>	2,4m <sup>2</sup>
	≥5 panes		4	5	2,5m <sup>2</sup>	3,0m
Note: Accumulation of defects occurs if four or more defects are at a distance of < 200 from each other. This distance is reduced to 180 mm for laminated glass consisting of three panes, to 150 mm for laminated glass consisting of four panes and to 100 mm for laminated glass consisting of five or more panes.						

### 11.2.2. Application of PN-EN ISO 12543

The criteria for evaluating the final product may differ from country to country. The processor is obliged to properly meet the quality requirements in the scope of guidelines and legal provisions.

## 12. Apparent defects during the production of insulation glazing

The following are excluded in the assessment and do not represent grounds for complaints:

- Interference phenomena
- Double sheet effect
- Multiple reflections
- Condensation on outer surfaces

### 12.1. Interference phenomena

Interference phenomena can occasionally occur in multiple sheet insulation glazing. This aspect is due to mutual influencing of light rays and the precise plane parallelism of float glass panes, a requirement for distortion-free view. These interferences consist of rings, stripes or stains visible to a greater or lesser extent in spectral colours. They move around in response to a finger pressing on the glass surface. Interference phenomena do not affect the view through or function of insulating glazing; they are a physical feature and therefore do not represent grounds for complaint. Interferences can, in certain cases, be eliminated by turning or slightly changing the inclination angle of the insulation glazing.

### 12.2. Double sheet effect

Air is hermetically sealed in the cavity in all insulation glazing. The pressure inside the insulation glazing is therefore determined by the height of the manufacturing location, the atmospheric pressure and the air temperature at the time of manufacturing. If conditions differ at the installation site, there will be a difference between the outside air pressure and the air pressure in the insulation glazing cavity. This can lead to temporary bulging out or in of the individual float glass sheets. Reflected images may appear distorted to some extent when viewed from outside. This does not in any way affect the quality of the insulation glazing, its thermal and sound insulation properties, light transmittance or clear view. The outer sheet can be slightly thicker to improve the optical quality of solar control glazing.

The pressure difference is then absorbed by the thinner sheets while the thicker sheet remains stable. However, care is required with regards to smaller-format insulation glazing or glazing with unfavourable height-width ratios. The permissible bending tensile stress can be more rapidly exceeded than in large format glazing.

This can lead to the glass fracturing. The double sheet effect is based on physical laws and does not therefore represent any grounds for complaint.

### **12.3. Multiple reflections**

Varying intensities of multiple reflections can occur on the different surfaces of the insulation glazing.

This effect may be reinforced by reflective coated sheets. As this is a natural property of the glass, multiple reflections are not grounds for complaint.

### **12.4. Condensation on outer surfaces**

#### **12.4.1. Interior side**

The dew point on the glass surface facing into a room is determined by the heat transmission value (U value), air humidity, room temperature and air circulation. More recently constructed windows are more tightly sealed than older frame systems, thereby preventing heat losses, but also moisture exchange. This increases room humidity and, once a certain level of humidity is reached, the room-facing glass surface will be subject to condensation. This increase in humidity can be prevented by frequently airing the room for a brief period.

#### **12.4.2. Exterior side**

Due to the higher thermal insulation of modern insulation glazing, the outer sheet only warms up to a negligible extent as very little energy can be transmitted from the inside to the outside. The outer sheet cools even further during low temperatures at night and condensation will occur if there is high humidity.

## **13. Legal information**

Euroglas developed the most important guidelines and recommendations at the time of their creation to the best of knowledge and belief.

Euroglas is not responsible for missing information regarding the abovementioned guidelines for the Eurolamex® product group.



Our guidelines for processing laminated glass and laminated safety glass do not regulate orders and handling of glass with Silverstar coatings.

Ask your sales representative for appropriate guidelines for formats.

Euroglas reserves the right to change the content of the study at any time without notice.

#### **14. Marks and labels**

We recommend using labels with acrylic adhesive.

They can be peeled off many times and leave the smallest marks on the glass.

#### **15. Laminated safety glass**

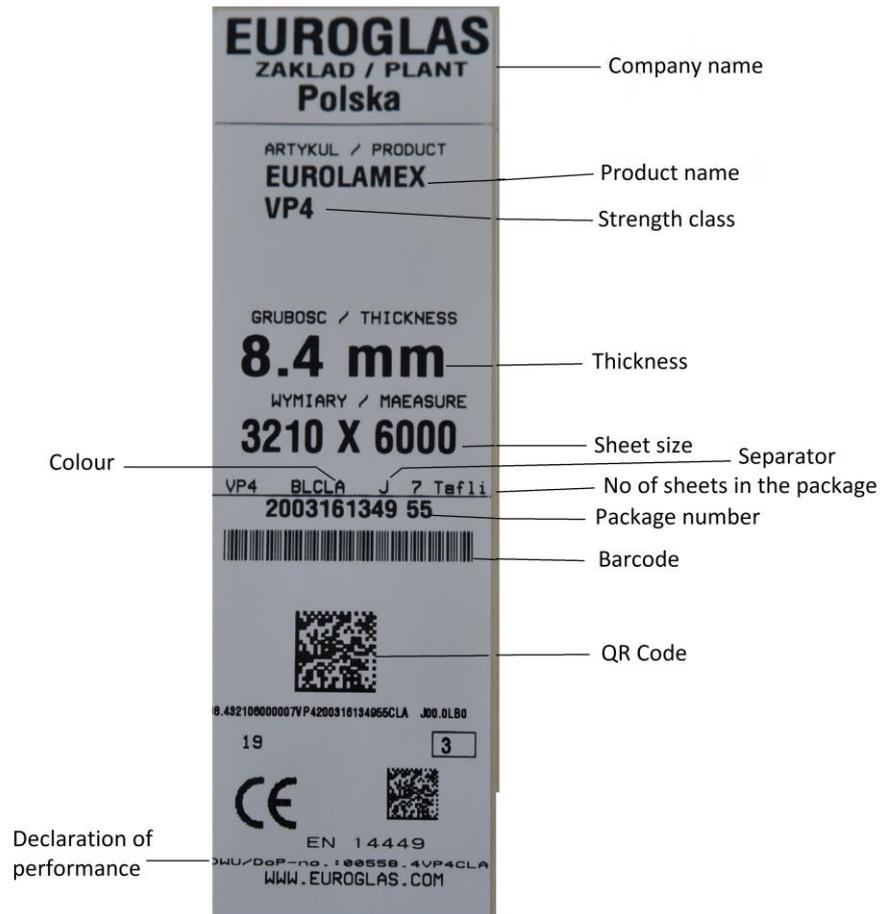
In a standard structure of an insulating glazing unit, as a rule, the pane is mounted with its uncoated side out.

We recommend that you always install the glass tin side in position 1.

#### **16. Product traceability**

To avoid confusion with Eurolamex<sup>®</sup> glass identification, it is recommended to leave the label provided on the last pane.

## 17. Labelling



## **18. Declaration of performance**

Access to the declaration of performance can be obtained online at:

<https://www.glastroesch.com>

To do this, enter the LE-DoP number (e.g. 00823.0C01CLA) and request a document.

The LE-DoP number can be found on invoices, delivery notes and labels.

## **19. Identification of the tin side**

To identify the tin side, use an ultraviolet lamp or tin detector.

## **20. Determining the structure of insulated glass**

Determination of the thickness of the component panes of the installed glass packet can be done, e.g. using a laser meter.

## **21. PVB films - compatibility with sealant**

Generally, the PVB film manufacturer does not recommend or use special sealant - we recommend avoiding direct contact between PVB and sealant.

In any case, ask the PVB manufacturer or sealant manufacturer for the latest detailed test results and current processing instructions.

## **22. Certificates**

Certificates and declarations can be obtained by contacting the Sales Department.

## 23. Standards for glass in building

### **EN 356: Glass in buildings**

Security glazing - Testing and classification of resistance against manual attack

### **EN 410: Glass in buildings**

Determination of luminous and solar characteristics of glazing

### **EN 572: Glass in buildings**

Part 1/2/8/9 Basic soda lime silicate glass products

### **EN 673: Glass in buildings**

Determination of thermal transmittance (U-value) – Calculation method

### **EN 674: Glass in buildings**

Determination of thermal transmittance (U-value) – Guarded hot plate method

### **EN 1096: Glass in buildings**

Part 1-4 Coated glass

### **EN 1279: Glass in buildings**

Part 1-6 Insulating glass units

### **EN 1863: Glass in buildings**

Part 1/2 Heat-strengthened soda lime silicate glass (HSG)

### **EN 12150: Glass in buildings**

Part 1/2 Thermally toughened soda lime silicate safety glass (SGS)

### **EN ISO 12543: Glass in buildings**

Part 1-6: Laminated glass and laminated safety glass

### **EN 12600: Glass in buildings**

Pendulum tests, impact test method and classification for flat glass

### **EN 12898: Glass in buildings**

Determination of the emissivity

### **EN 13363: Solar protection devices combined with glazing**

Part 1/2 Calculation method

### **EN 20140-3: Acoustics**

Measurement of sound insulation in buildings and of building elements

Part 3: Laboratory measurements of airborne sound insulation of building elements

### **DIN 1055-5: Design loads for buildings. Live loads, snow loads and ice loads**

**DIN 1249-10: Glass in building**

Chemical and physical properties

**DIN 4102: Fire behaviour of building materials and building components**

**DIN V 4108-4: Thermal insulation and energy economy in buildings**

**DIN 4109: Supplementary sheet 1 / A1: Sound protection in buildings**

**DIN 18032-3: Testing of safety against ball throwing**

**Halls for gymnastics, games and multi-purpose use**

**DIN 18516 Part 4: External enclosures of buildings, made from tempered safety glass panels; Requirements and testing**

**Requirements and testing**

**DIN 18545: Glazing with sealants, Part 1–3**

**DIN 52210: Airborne impact and sound insulation**

**DIN 52294: Determination of the loading of desiccants in insulating glass units**

**DIN 52460: Sealing and glazing Terms**

**DIN 52611: Determination of thermal resistance of building elements**

**DIN 52612: Testing of thermal insulating materials**

Determination of thermal conductivity by means of the guarded hot plate apparatus, test procedure and evaluation

**DIN 52619: Determination of the thermal resistance and the thermal transmission coefficient of windows**

**DIN 53122: Determination of water vapour transmission**

**DIN 58125: Construction of schools**

Constructional requirements for accident prevention

**TRLV: Technical rules for the use of linear supported glazing**

Complete text extracts and secondary standards for the glass in the building sector are available at [www.pkn.pl](http://www.pkn.pl) and also [www.beuth.de](http://www.beuth.de)

## 24. Troubleshooting

If you encounter any problems, we are always available. Submitted samples can be examined and evaluated for errors.

However, before you ask the glass or device supplier for assistance, verify the following:

- Does the wheel still rotate easily when installed?
- Does the wheel have too much lateral play when installed?
- Is the wheel contaminated with cutting fluid residue or glass particles?
- Is sufficient cutting fluid being applied or does it stop dispensing during the cutting process?
- Is the wheel angle right for the glass thickness / glass type / shape cuts or straight cuts?
- Is the cutting pressure right for the wheel angle and the glass thickness/ glass type?
- Does the wheel holder have too much lateral play in the cutting head?
- Is the axle worn?
- Is the cutting speed appropriate for the glass being cut?
- Is the wheel aligned 100% precisely in the cutting direction?
- Does the head work lightly and set itself relative to the cutting direction?
- Does the crack create a silvery or white cut line? A white mark indicates too much cutting pressure or insufficient cutting fluid.
- Does the glass contain excessive separating powder? This impairs perfect cutting and can cause the wheel to jam.

- Do you use the right diameter of the cutting wheel for the thickness, type and shape of the glass? Thin glass and formats with small radii should be cut with cutting wheels of smaller diameters.
- Is the wheel worn?
- Is the heating time too short or too long?
- Is the heating power too low or too high?
- Is the separation force of the glass not too low or too high?
- Is the force needed to keep the glass broken and separated properly selected for the thickness, type and shape of the glass?
- Do the breaking elements have the correct geometry?
- That the suction cups supporting the sheet are clean enough?
- Is the glass correctly positioned?
- Are the beginning and end of the cut in the right place?