



AGC

Laminated Glass Stratobel and Stratophone PROCESSING GUIDE

VERSION 1.0 – 11/2024

Your Dreams, Our Challenge

WARNING

Carefully read this manual before processing
Stratobel and Stratophone



Important Preliminary Instructions

- At each stage during processing, the personnel responsible for handling the glass must wear and use the appropriate equipment: safety shoes, safety gloves, safety glasses, etc.
- When processing coated laminated glass, the relevant Processing Guide for the coated glass product in question (magnetron or pyrolytic coated) is applicable. The same applies if coated glass is further processed into a laminated glass product.
- For Stratobel Mirox products, the relevant Processing Guide for the mirror product in question (Mirox MNGE and 4GREEN+) is applicable for the mirror component.

Additional information, advice and recommendations regarding products and processing can be found below.

This version of the guide replaces and cancels all previous versions.
Please regularly check www.agc-yourglass.com for any updates.

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0. PRODUCTS

This Processing Guide covers the laminated glass products Stratobel, Stratobel Strong, Stratophone, Stratobel Mirox and Stratobel Security Burglary with all types of PVB interlayers available from AGC in stock sizes (jumbo sizes)

This Processing Guide is not valid for bulletproof or explosion-resistant glazing.

For coated laminated glass, please refer to the relevant Processing Guide for the coated glass product in question (magnetron or pyrolytic coated). The same applies if a coated glass is further processed into a laminated glass product.

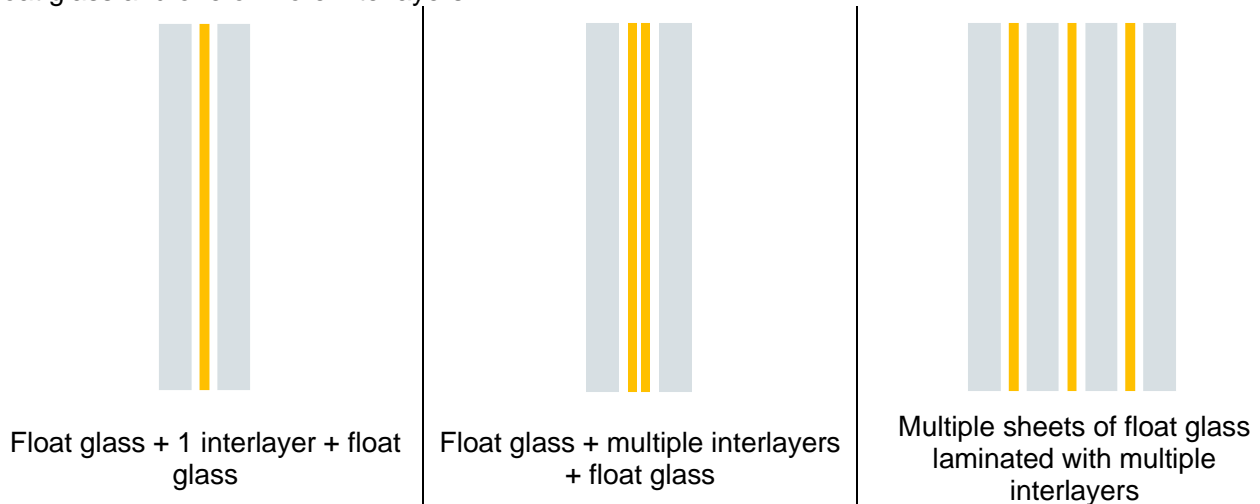
For Stratobel Mirox products, please refer to the relevant Processing Guide for the mirror product in question (Mirox MNGE and 4GREEN+) for the mirror component.

The term 'laminated glass' used in this document also includes 'laminated safety glass' and other types of laminated glass, including those not expressly mentioned.

For final cut size laminated glass made, for example, out of two tempered glass panes, please consult the Technical Advisory Service or your sales representative.

1. Stratobel, Stratobel Strong, Stratobel Security Burglary and Stratophone

Laminated glass is produced by combining a sheet of float glass sheet with one or more other sheets of float glass and one or more interlayers:



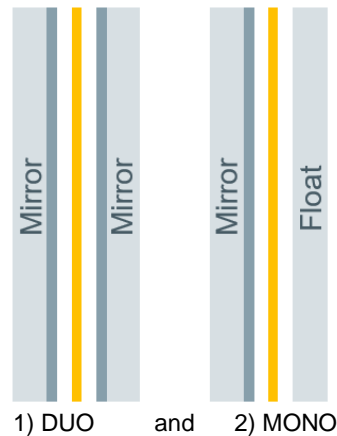
The Stratobel and Stratophone ranges can be used for safety and sound insulation purposes and can be installed indoors and outdoors.

2. Stratobel Mirox

Stratobel Mirox range is a special laminated glass product that combines the optical features of a standard mirror with the safety of a standard laminated glass product, without compromising on quality or durability.

Stratobel Mirox is available in two configurations:

- 1) Mirror + Mirror (Duo)
- 2) Mirror + Float (Mono)



Stratobel Mirox should be used indoors only. For outdoor projects, please contact AGC.

I. RECEPTION and STORAGE

1. Unloading

The packaging of the glass sheets depends on the type of product and on the final destination. The exact contents of each package are indicated on the label affixed to the edge of the pack or packaging.

When unloading the truck, the packaging must be inspected carefully. Any damage must be immediately reported to AGC.

AGC will accept no liability for faults arising after delivery or during handling, processing or installation of the finished product in the building if the procedure described below is not followed:

- The stillage must be positioned on perfectly level ground.
- Appropriate handling equipment must be used.
- The grab must be perfectly centred.
- Care must be taken to avoid damaging the protective packaging during handling.
- The glass must be stored on appropriate racks.
- All recommendations given in this Processing Guide must be followed strictly.

Unloading PLFs

- Make sure the stillage is positioned on perfectly level ground.
- Use the appropriate clamp
- Handle only one pack at a time.
- Make sure the clamp is perfectly centred.
- Take care to prevent any damage to the glass by using protective materials in those areas where there is contact with the glass.

Unloading DLFs

Bulk packaging:

- Make sure the trailer is positioned on perfectly level ground.
- Release the straps and blocks.
- Use the appropriate clamp or sling.
- Handle one pack at a time.
- The clamp must be perfectly centred.
- The slings must be positioned under the pack, at the ends. The angle between the slings must be no more than 90°.
- Take care to prevent any damage to the glass by using protective materials in those areas where

there is contact with the glass.

Packaging on L frames:

- Check that the glass is correctly centred on the frame before lifting.
- Make sure the trailer is positioned on perfectly level ground.
- Release the straps and blocks.
- The belt-clamping or steel slat bars must NOT be opened at this stage.
- Use an appropriate lifting beam, with a double hook at each end (see diagram on frame).
- Handle one frame at a time.

Packaged in wooden endcaps:

- Make sure the trailer is positioned on perfectly level ground.
- Release the straps and blocks.
- The strapping on the endcaps themselves must NOT be cut at this stage.
- Use slings or an appropriate lifting beam.
- The slings must be positioned under the upper or lower ends of the endcap.
- The angle between the slings must be no more than 90°.
- Handle one endcap at a time.

General comments

- Clamps, slings, lifting beams and other handling equipment must comply with prevailing regulations and must be approved by the relevant authorities.
- Suction pads must be perfectly clean.
- Any direct contact with hard materials must be avoided.
- Ensure the safety of personnel at all times. Keep all unnecessary personnel out of the handling area. Wear appropriate personal protective equipment.
- Personnel must check that the suction pads are adhering correctly before any further manipulation.
- Personnel must have received the required training.

2. Storage of the packs

Correct storage helps to prevent deterioration caused by the following:

- chemical hazards: surface defacement caused by water, moisture or condensation
- mechanical hazards: surface accidents, breakage, etc.

Storing packs correctly reduces the risk of chemical or mechanical damage to the glass.

As a general rule, care should be taken to avoid major fluctuations in temperature and humidity that may cause condensation on the surface and/or edges of the glass. Such fluctuations generally occur near loading and unloading areas. No water or other liquids may be allowed to come into contact with the sheets of glass.

Storage areas should be well ventilated and out of sunlight in order to prevent the risk of thermal stress. AGC recommends maintaining a temperature of between 15 and 25 °C and a relative humidity of less than 80%.

Glass sheets showing signs of moisture due to temperature fluctuations during transport must be dried or processed as soon as possible.

Factory racks are used for packaging during transport and are not designed to be used for storage. Consequently, the glass sheets must be stored on racks with spacers between packs ensuring that all packs of the same size are stored together.

As a general rule, AGC recommends to apply the “first-in-first-out” principle.

3. Handling

Handling PLFs

- PLFs must be lifted with a suction pad lifting beam or with an automatic unstacking machine.
- Labels and/or tape on the edge of the pack must be removed before handling PLFs.
- The lifting beam must be properly centred.
- The PLF must first be lifted slightly and then moved away from the others.
- Care must be taken to prevent scratches by ensuring that the edge of one PLF does not rub against the surface of another PLF.

Handling DLFs

Lose Packing:

- Glass sheets must be lifted with a suction pad lifting beam or with an automatic unstacking machine.
- Labels and/or tape on the edge of the pack must be removed before handling the glass.
- The lifting beam must be properly centred.
- The glass sheet must first be lifted slightly and then moved away from the others.
- Care must be taken to prevent scratches by ensuring that the edge of one glass sheet does not rub against the surface of another glass sheet.

Packaged in L frames:

- Ensure that the pack rests on the uprights, not on the belt clamps or on the steel slat bars.
- Open the belt clamps or steel slat bars.
- Remove the belt clamps or steel slat bars.
- Glass sheets must be lifted with a suction pad lifting beam or with an automatic unstacking machine.
- Labels and/or tape on the edge of the pack must be removed before handling the glass sheets.
- The lifting beam must be properly centred.
- The glass sheet must first be lifted slightly and then moved away from the others.
- Care must be taken to prevent scratches by ensuring that the edge of one glass sheet does not rub against the surface of another glass sheet.

Packaged in wooden endcaps:

- Set the endcap on a support inclined at a slight angle (5°).
- Cut the vertical strapping.
- Remove the upper cover and then the two side covers.
- Remove the plastic protecting the glass.
- Glass sheets must be lifted with a suction pad lifting beam or with an automatic unstacking machine.
- Labels and/or tape on the edge of the pack must be removed before handling the glass sheets.
- The lifting beam must be properly centred.
- The glass sheet must first be lifted slightly and then moved away from the others.
- Care must be taken to prevent scratches by ensuring that the edge of one glass sheet does not rub against the surface of another glass sheet.

II. PROCESSING

Since Stratobel Mirox products are highly reflective, any sensors and/or detectors on the processing conveyors may need to be adjusted slightly.

1. Safety

At each stage during processing, personnel must wear and use the appropriate personal protective equipment: safety shoes, safety gloves, safety glasses, etc. Personnel must also have received the required training.

2. Cutting

The following specific precautions must be taken when cutting:

- The cutting oil used must be compatible with the interlayer and the mirror paint. It must be neutral, sufficiently volatile and water soluble.
- No particular spacer is needed if the original separation powder is still present. However, if for any reason there is not enough separation powder left on the glass, we recommend that you place cork pads between the sheets. These cork pads must be placed on the perimeter of the glass, never in the centre.
- pH-neutral paper or corrugated cardboard can be used, assuming that it is clean and dry.
- The glass unit must be cut on both sides. The two cuts must be perfectly aligned.
- Various techniques can be used to separate the PVB interlayer (heating, cutting with a razor blade, etc.). Avoid overheating the edges, as doing so could lead to thermal breakage. Avoid chipping.

The quality of the cutting process depends on multiple parameters. The key basic parameters are:

- cutting technology (manual, semi-automatic, fully automatic)
- cutting wheels (diameter, geometry, angle, material, age, performance)
- cutting pressure and speed
- cutting fluid (type and composition)

The appropriate cutting parameters must be determined for each type of cutting equipment and must also be determined for each glass thickness, glass type (e.g. clear glass) and glass manufacturer.

If you have specific questions, please contact the supplier of your cutting table for further advice.

It is also recommended to carry out trials before cutting the glass for an original order. Special attention must be paid to signs of wear on the cutting wheel (wear, non-circular running behaviour). Wear can be minimised by choosing the correct cutting pressure and by using cutting fluid. The wheel carrier must also be regularly checked for wear, maintained and replaced if necessary.

Conventional cutting wheels should achieve a penetration depth of 0.02 mm into the glass surface regardless of their angle. It should be noted that linear wear occurs. This means that the cutting wheel becomes continuously blunter during its lifetime and must be replaced regularly.

To increase the stability of cutting wheels and to operate longer at a lower cutting pressure, it is recommended to use coated hard metal wheels or cutting wheels with a so-called microstructure (similar to a gear wheel structure).

2.1. Cutting Stratobel and Stratophone with common and acoustic PVB interlayers

In addition to the above-mentioned parameters for cutting glass, when cutting laminated glass attention must also be paid to:

- heating time/ heat
- breaking pressure

In addition to conventional cutting techniques, laminated glass can also be cut using a saw or a waterjet cutting machine.

Deviations due to the condition of the material, humidity, temperature an/or other external influences must be recognised and taken into account by the operator.

The standard laminated glass cutting procedure is as follows:

- Score the upper and lower sheets of glass.
- Break the glass sheets at the score line.
- Heat the unit using an IR lamp, typically a fast lamp, i.e. a shortwave (SW) or fast medium wave (FMW) lamp that heats up instantaneously when switched on.
- Separate the glass at the cut just enough to enable the knife blade to be inserted into the gap (the gap is very small; make sure to avoid tearing the interlayer).
- Or simply cut the glass directly if no additional heating is required.

It is also very important to avoid pulling out the PVB interlayer.

The procedure for cutting Stratobel Mirox is similar to the procedure for cutting Stratobel/Stratophone laminated glass.

2.2. Cutting Stratobel Strong (Structural PVB interlayer)

Stratobel Strong can be cut in the same way as Stratobel and Stratophone products (with standard PVB), but with modified settings. Proceed as follows:

- Stratobel Strong cutting settings for 66.2 = Stratobel/Stratophone cutting settings for 88.2
- Stratobel Strong cutting settings for 88.2 = Stratobel/Stratophone cutting settings for 1010.2
- Stratobel Strong cutting settings for 1010.2 = Stratobel/Stratophone cutting settings for 1212.2
- Stratobel Strong cutting settings for 88.4 = Stratobel/Stratophone cutting settings for 1010.4

In addition to conventional cutting techniques, laminated glass can be also cut using a saw or a waterjet cutting machine.

Cutting Stratobel Strong with a saw requires the saw blade to rotate at just 50% of the speed needed for sawing standard laminated glass with a conventional PVB interlayer.

2.3 Cutting Stratobel Security Burglary

Conventional cutting, sawing and waterjet cutting techniques can be used to cut the following Stratobel Security Burglary products:

- 502-2
- 902-2

Only sawing and waterjet cutting can be used to cut the following Stratobel Security Burglary products (conventional cutting cannot be used because of the multiple float glass sheets):

- 103-7
- 103-3
- 303-7

3. Edge processing

3.1 Handling the glass

Personnel responsible for handling and shaping the edges of the glass must wear safety gloves.

3.2 Shaping the edges

For edge processing, as a general rule, the same equipment and machines can be used as for standard (non-laminated glass) glass products. However, the grinding tools must be suitable for edge-processing laminated glass.

General recommendations for edge-processing glass:

- The glass must remain wet throughout the shaping process in order to prevent natural drying.
- The glass must be washed as soon as it has been shaped.
- The glass may be drilled, provided that the press is covered with soft protective material.
- The glass may be processed using dry crossed belts, provided that the extraction system is sufficiently effective to remove the dust caused by grinding.
- If a liquid is used during the shaping process, it must be chemically compatible with this type of glass, interlayer (PVB) and mirror paint. It must also be easy to wash off.
- AGC recommends carrying out tests before starting the process.
- Personnel responsible for shaping operations must have received the required training and must wear clean gloves.
- All tools, conveyors, etc. that might come into contact with the glass must be kept clean.

The procedure for edge-processing Stratobel Strong (which includes a structural PVB interlayer) is similar to that used for Stratobel/Stratophone laminated glass.

4. Washing

This stage involves washing, rinsing and drying the glass. The washing machine must be maintained regularly.

Laminated glass must be washed with clean water. A small quantity of a mild detergent solution which does not contain any abrasives or acids (specifically chlorine, fluorine or alkalis) may be mixed into the water.

Before washing the glass panes, make sure to remove all residue and particles that could scratch the surface of the glass (grains of sand, glass splinters, iron oxides, etc.).

The glass must be completely dry. We recommend checking that the air filters in the ventilation units are clean.

A spraying unit should be installed just before the point in the process where the glass enters the washer to ensure that abrasive particles (residues from the working process) are removed from the glass surface, since such particles might scratch the glass surface if they come into contact with the washing brushes. The spraying unit must be set up in such a way that the glass surface is thoroughly rinsed before the washing process begins.

If the glass is washed in an automatic machine it is important to regularly check the wash water as well as the cleanliness and hardness of the brushes in the washing machine in order to prevent the build-up of abrasives. Doing so will help prevent any damage to the surface of the glass.

The glass sheets must be dried thoroughly and immediately after washing. AGC recommends

regularly checking the filtration quality of the air used to dry the glass.

The key criteria for the washing machine are as follows:

- The washing machine itself, including its pipe system, must be clean.
- The machine must have roller brushes that are appropriate for washing the coated side of the glass, i.e. they must have a bristle diameter of 0.20 mm.
- Roller brushes with larger bristle diameters in the pre-washing zone must be retractable.
- It is recommended that maintenance be carried out at regular intervals.

5. Assembly in insulating glass units

Stratobel Mirox should not be assembled in insulating glass units.

Stratobel, Satrobrel Strong, Stratobel Security Burglary and Stratophone glazings can be assembled in insulating glass units.

The glazing must first be thoroughly rinsed and dried to prevent any traces of drops on the glass.

Note:

For the EU, when assembled in IGUs, laminated glass products must be CE marked in accordance with EN 1279-5. Under EU regulations, all the requirements set out in these standards (TT, FPC, etc.) must be met by the processor. With respect to correctly assembling Stratobel Security Burglary in an IGU, you must check your local requirements to find out the side on which Stratobel Security Burglary must be placed (i.e. on the side subject to attack (by a burglar, etc.) or on the opposite side).

Compatibility

The principle of material compatibility can be described as follows: “Materials are compatible if there is no occurrence of detrimental interactions.” For glazing systems, it is mainly the components that must be compatible when they interact and when they come into direct or indirect contact with the edge seal of the insulating glass unit.

These components include:

- glazing sealants
- cleaning agents
- glazing blocks
- interlayers in glass units
- edge seal systems in insulating glass units
- accessories which come into contact with interlayers in glass units and edge seal systems
- other subsidiary building materials (such as chalk powder, films, foils, etc.)
- protective films for the glass unit

Interactions between the wide range of bonding materials, sealants and accessories used cannot be ruled out, but are acceptable unless they have a negative effect on the functional requirements, durability or visual appearance of the building component.

The procedures for verification are described in ift Guidelines DI 01/1 and DI 02/1.

6. Heating during processing

When processing laminated glass as PLFs/DLFs, the temperature of the process must be limited to avoid damaging the product (interlayer and mirror paint). This means that the process temperature must not exceed 60 °C.

7. Other types of processing

Other types of processing carried out on Stratobel, Stratobel Strong, Stratobel Mirox and Stratophone include:

- drilling
- etching (the edges and other surfaces of the glass must be protected)
- laminating the laminated glass with another glass
- printing and painting (with special attention paid to high-temperature and UV polymerisation)
- UV bonding (with special attention paid to UV polymerisation)

Special care must be taken during all of these types of processing. For further assistance, please contact your supplier for information on auxiliary materials and processing machines.

III. CONFORMITY AND WARRANTY

1. Conformity

Stratobel and Stratophone laminated glass products comply with standard EN 14449, which includes information about inspection conditions and quality criteria.

For additional properties, such as burglar resistance, bulletproofing and explosion resistance, please refer to the relevant testing and classification standard.

2. Warranty

AGC provide a 10-year warranty for the entire Stratobel/Stratophone range.
The full details and conditions of this warranty can be found at www.agc-yourglass.com.

3. CE marking

All information and declarations concerning the CE marking can be found at www.glassconfigurator.com.

When customers process Stratobel and Stratophone products, they are responsible for applying the CE marking to processed products and fulfilling the associated requirements (performing type tests (TTs), marking the glass, factory production control, etc.).

4. Disclaimer

It is the responsibility of the processor to inspect the laminated glass adequately before and after each step of fabrication and prior to installation. Failure to comply with all professional standards, customary instructions and processing instructions set out in this Processing Guide and related links will automatically void any warranty pertaining to AGC laminated glass. We advise the processor to undertake preliminary trials with the typical glass compositions used in the project in question prior to any further commitment with its customer. The processor is solely responsible for the quality of the final product. It is also the responsibility of the processor and installation company to check the national regulations applying to laminated (safety) glass.

The installation company and the user are responsible for choosing the appropriate types of glass as well as the appropriate glass thickness and interlayer thickness in compliance with local regulations pertaining to the application and loads in question.

IV. GLAZING INSTRUCTIONS

AGC's glazing instructions can be found at www.agc-yourglass.com. For laminated glass with exposed edges, the following must be taken into consideration:

Laminated glass and laminated safety glass with exposed glass edges are permitted only if the edge complies with DIN 1249-11 and NF DTU 39-P5:

- smooth-ground
- polished
- bevelled

The desired edge quality must be specified in the order. Optical effects at the bearing edge, as well as interlayer residues in the rounded area and interlayer films protruding from the final laminated glass product are unavoidable due to the manufacturing process.

Optical changes may occur in the 15 mm wide peripheral zone of the laminated glass if the film is permanently exposed to moisture. To prevent these optical/visual alterations, the construction process must be carried out in such a manner that the structure itself, or the provision of an adequate system of ventilation, ensures that permanent exposure of the film on the glass edge to moisture and dampness is avoided.

For glass canopies/awnings/roofs, for example, this can be achieved using a laminated safety glass with a projecting edge (step).

It is essential that the glass edges be cleaned professionally at appropriate intervals to preserve the performance of the laminated glass throughout its entire lifetime.