

INSTRUCTIONS FOR INSTALLING

## PLEXIGLAS® Multi-Skin, Corrugated and Solid Sheets





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Glass is known for its weight and fragility. PLEXIGLAS®, on the other hand, is a whole lot tougher. It is lightweight, safe to handle and easy to fabricate. This brochure gives step-by-step instructions for successful installation of PLEXIGLAS® multi-skin and corrugated sheets.

You can find information on the properties and applications of our products in our various publications, including the information brochure on PLEXIGLAS® multi-skin and corrugated sheets, product descriptions, guarantees, etc., which are available on the Internet at [www.plexiglas.de](http://www.plexiglas.de) or from distributors.

When selecting and using our products, you are advised to observe

- the regional building codes
- the applicable standards, e.g. DIN 1055
- the warranty provisions according to VOB (Contracting rules for award of public works contracts) or BGB (German Civil Code)
- the guidelines of the employers' liability insurance association, and so on.

# Creative and contemporary

## Easy to fabricate

PLEXIGLAS® is just as easy to fabricate as wood. Partitions, balcony guards or door infill panels can be designed according to individual wishes.

## 30-year guarantee against yellowing



PLEXIGLAS® always puts you on the safe side. We give a 30-year guarantee that clear-transparent PLEXIGLAS® will not yellow and will retain its high light transmission.

## Lightweight but strong

Even the heaviest sheet in our roofing range weighs less than 6 kg per square meter. That saves effort during installation and reduces the required number of helpers.

## Safety and protection against UV light

Sunburn is a thing of the past with selected grades of PLEXIGLAS® multi-skin and corrugated sheets, which absorb UV light. That has been confirmed by the Hohensteiner Institute in line with the stringent Australian standard AS/NZS 4399:1996.

## Less need for cleaning thanks to AAA\*

One of the main causes of roof soiling is the growth of algae, mosses etc. But many roofs are difficult to clean because they are hard to reach. Our new generation of PLEXIGLAS® Resist SDP 16 multi-skin sheets has therefore been provided with an Anti-Adhesion Application (PLEXIGLAS® Resist AAA) based on nanotechnology. This coating uses the sun's natural UV radiation to make algae, mosses, pollen and other soiling agents lose their grip on the sheet or dissolve completely. The dissolved residue is almost completely washed off by the next rainfall.



\* Anti-Adhesion Application





# Instructions for installing PLEXIGLAS® multi-skin sheets

## Planning

Careful planning and choosing the right tools, combined with correct storage and fabrication of PLEXIGLAS®, guarantees that you will be satisfied with the overall structure for a long time to come.

### Tools/auxiliary agents

The following tools/auxiliary agents are required for installing PLEXIGLAS® multi-skin sheets, depending on the type of project.

- Paint brushes
- White, light-resistant emulsion paint
- Tape measure
- Metal saw
- Rivet pliers/rivets
- Electric drill
- Screws for fastening the base sections
- Circular handsaw with multi-tooth saw blade

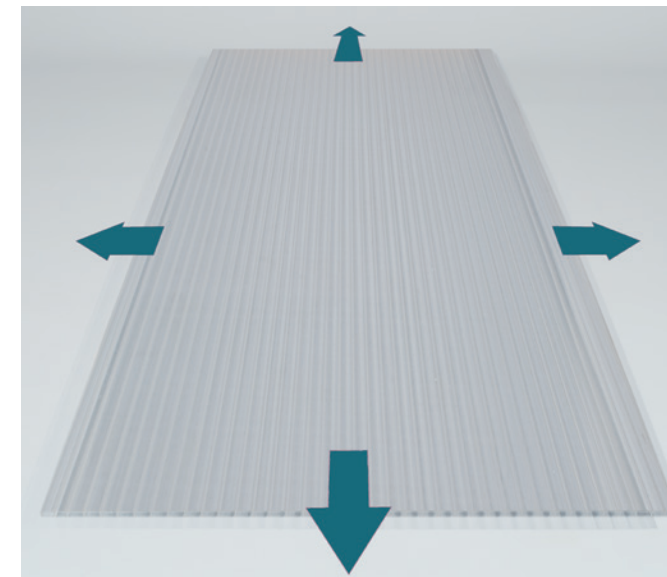
And/or

- Conical drill/plastics drill
- Jigsaw with saw blade for 'unplasticized plastics'
- Wire brush
- Compressed air/vacuum cleaner
- Crawling boards or other support to prevent scratching
- Silicone rubber (suitable variants are available from PLEXIGLAS® suppliers)



### Storage

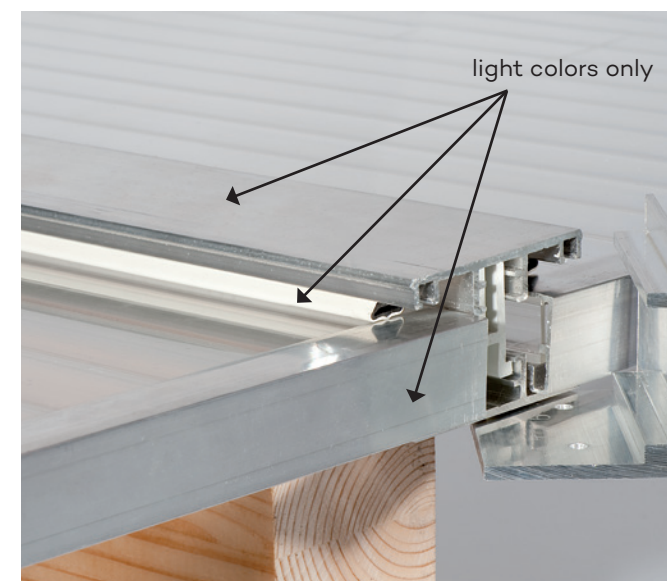
If PLEXIGLAS® multi-skin sheets are not to be installed straight away, they should be stored correctly until used. Make sure the cavities are protected from soiling by suitable end closure sections (inserted at the factory). The same applies to sheets cut on site. If possible, please store the sheets indoors. The PLEXIGLAS® multi-skin sheets are protected against sunlight and moisture during transport by white PE sheeting. Please leave this sheeting in place if the sheets are stored outdoors. The same applies to opened pallets.



### Allowance for expansion

PLEXIGLAS® multi-skin sheets expand due to heat and moisture. A general allowance is therefore to be made of approx. 5 mm/m for PLEXIGLAS® Alltop SP and of 6 mm/m for PLEXIGLAS® Resist and PLEXIGLAS® Heatstop. The sheets must not be allowed to slip out of the profiles due to shrinkage and must be able to expand freely to exclude damage by buckling.

Suppliers of PLEXIGLAS® multi-skin sheets will be pleased to provide information in this context on the correct choice of glazing systems, help with measurements, etc.



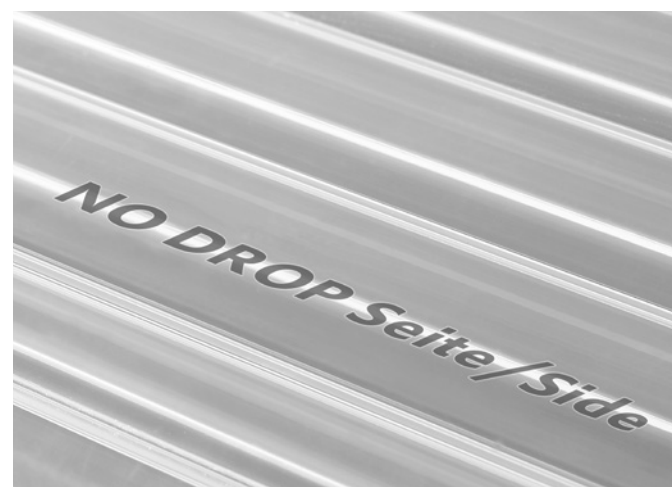
### Color of glazing systems Preventing heat buildup

Glazing systems, especially their upper clamping bars that are exposed to sunlight, should be light-colored (mill-finish aluminium, white uPVC). However, if an additional cover section is used to conceal the screws, this can also be dark because our tests have shown that it will not transfer an excessive level of heat to the clamping system below.

Do not use wide black rubber gaskets!

Dark-colored sealing gaskets only pose no risk of heat buildup if they are no wider than 15 mm. Cover panels that extend over the glazing should also be light in color.





## Installation direction

Many PLEXIGLAS® multi-skin sheets are equipped with an Anti-Adhesion Application (AAA) or a water-dispersing NO DROP coating. They show different properties depending which way round they are installed.

### AAA side facing outwards

This coating reduces pollen, mosses and algae by means of natural UV radiation. It additionally has a water-dispersing effect (NO DROP effect).

### AAA side facing inwards

Facing inwards, the coating has a water-dispersing effect (NO DROP effect) and causes condensation to flow off as a continuous film more or less without droplets.

### NO DROP side facing outwards

The coating on the top side has a water-dispersing effect and causes rainwater to flow off as a continuous film more or less without droplets. This provides a better cleaning effect.

### NO DROP side facing inwards

Facing inwards, the coating has a water-dispersing effect (NO DROP effect) and causes condensation to flow off as a continuous film more or less without droplets. The coated side and name of each coating is marked along the edge on the top side of the multi-skin sheets. There is also a corresponding note on the masking film.

On PLEXIGLAS® Alltop sheets, the NO DROP coating is applied to both sides and inside the cavities. The coating has a water-dispersing effect, causing rain and condensation to flow off as a continuous film more or less without droplets. Since the coating is applied to both sides, it makes no difference which side is installed facing inwards or outwards.

For outdoor applications, PLEXIGLAS® multi-skin sheets with a surface texture (C texture) should be installed with the textured side facing downwards. The smooth upper surface keeps the roof clean longer and is much easier to clean.

PLEXIGLAS® Heatstop multi-skin sheets with a co-extruded layer on one side should be installed with the coated side facing outwards (to reflect solar heat).



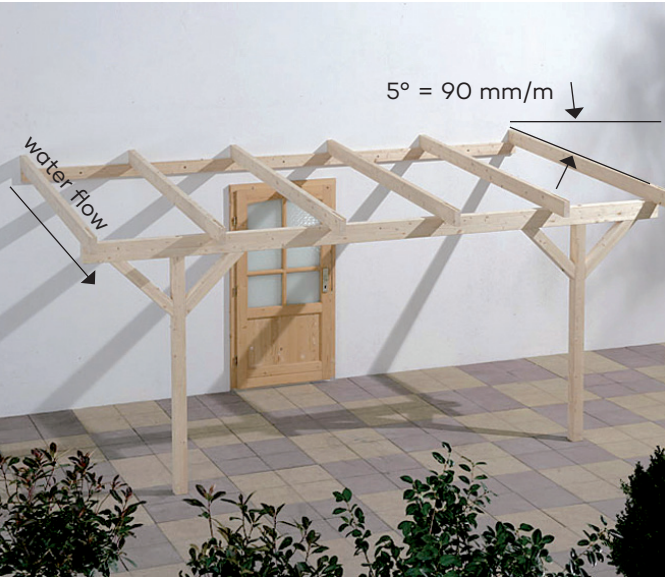
PLEXIGLAS® Resist SDP 16 C - texture

PLEXIGLAS® Heatstop S4P 32 Cool Blue





# Supporting structure



### Roof pitch

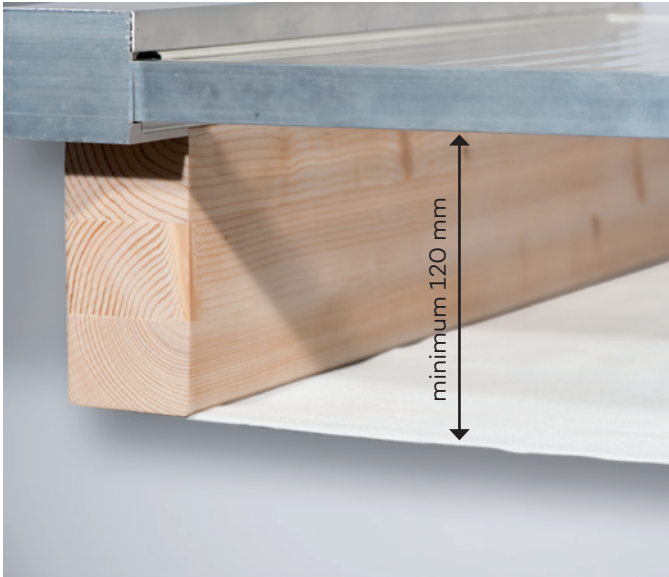
Roofs glazed with PLEXIGLAS® multi-skin sheets should have a roof pitch of at least 5° (= 90 mm/m) to allow rainwater to flow off safely. As a general rule, the greater the roof pitch, the better the roof can be cleaned by the rain. Sheets installed as roofing material must be installed with their webs in the direction of the slope, i.e. of the water flow. Avoid transverse butts and use sheets of roof length wherever possible. Otherwise, design the supporting structure in such a way that two roof sections are obtained that overlap at a distance.



### Material/Preventing heat buildup

The supporting structure should be non-warping and consist of laminated timber beams or metal. Dark surfaces heat up to a greater extent and faster than light-colored surfaces. It is therefore very important to provide all structural surfaces facing the sheets with a durable white or reflective coating (e.g. light-resistant emulsion paint). The heat-protective coating must be allowed to dry properly before installing the sheets. If dark-colored metal structures are used, the surfaces facing the sheets should also be light in color (this can be done by sanding, coating etc.).

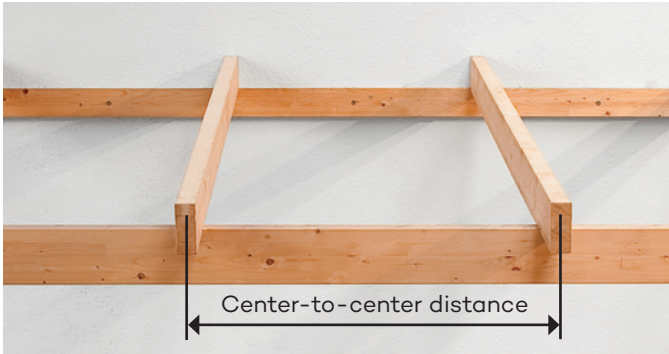
Supporting structures treated with wood varnish or paints should be allowed to air for several weeks before installing the multi-skin sheets.



### Interior shading/Preventing heat buildup

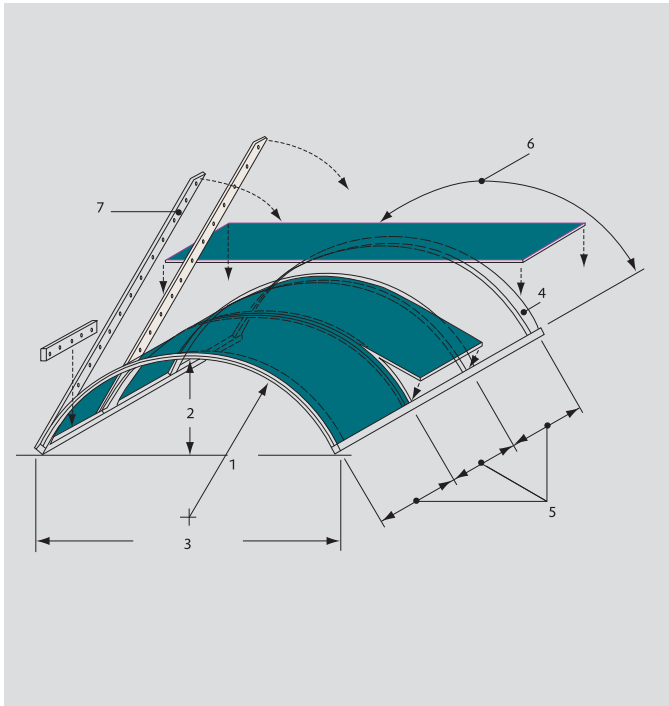
Interior shading devices (roller and venetian blinds, curtains etc.) should be white or heat-reflecting and compatible with PLEXIGLAS®.

They should be fixed at a distance of at least 120 mm from the glazing. Avoid wide, box-like closed areas behind/beneath the sheets. These are created by using double flashings or sealing sections above the purlin in the eaves area and may result in crack-inducing heat buildup, even if lined with reflective or white material. Such 'boxes' should therefore be avoided.



### Support spacing (center-to-center distance)

The center-to-center distance (from the center of one support to the center of the next) provides sufficient allowance for widthwise expansion of the PLEXIGLAS® sheets. It depends on the chosen glazing system and can be ascertained from PLEXIGLAS® suppliers. Typical center-to-center distances are, for example, sheet width + 20 to 30 mm.



### Barrel vaults

The impact-resistant grades PLEXIGLAS® Resist SDP and PLEXIGLAS® Heatstop SDP can be installed cold-curved, e.g. for barrel vault roofs.

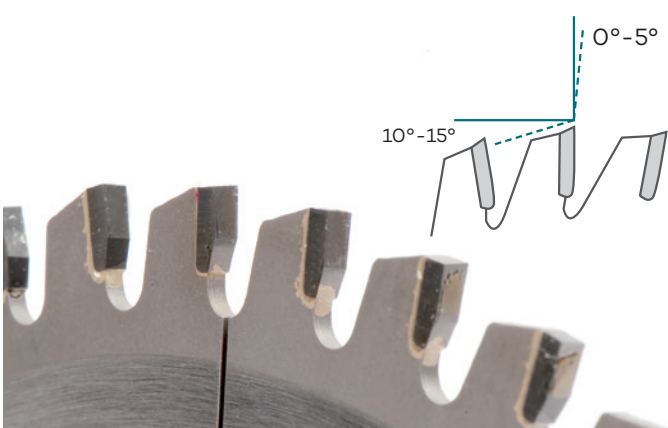
The minimum radius of 150 x sheet thickness must be observed. When calculating the hoop spacing, the expansion and rabbet or clamping depth of at least 15 mm must be borne in mind.

PLEXIGLAS® Alltop multi-skin sheets can only be installed flat.

- 1 = Radius
- 2 = Pitch
- 3 = Span
- 4 = Hoop
- 5 = Hoop spacing
- 6 = Arc length
- 7 = Clamping bar

# Machining

The ease and almost unlimited variety of options with which PLEXIGLAS® can be machined are among its main advantages as compared with many other transparent materials. Using the correct tools is essential for successful work



## Cutting to size

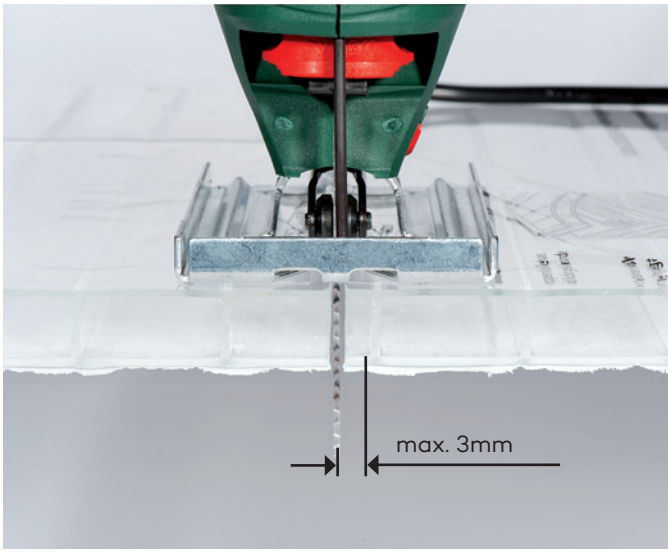
High-speed circular (hand)saws with unset, multi-tooth carbide-tipped blades are most suitable for cutting PLEXIGLAS® multi-skin sheets to size. We advise against the use of cutting disks to avoid possible damage to the sheets.



## Marking

Marking should be done on the masking film, which should be left on the sheet while working on it and until it has been installed.

The multi-skin sheets should be secured against flutter. It is best to work with a stop, such as a wooden bar, to prevent the saw from tilting and causing an accident or damaging the cut edge of the sheet.



## Reducing the sheet width

If the width of PLEXIGLAS® multi-skin sheets needs to be reduced, the cut edge should be 3 mm at most from the last web to ensure the clamping action of the glazing bar.



## Reducing the sheet width, reinforcing the open edge

If the skin of a cut-to-size sheet of PLEXIGLAS® SDP 16 sheets is to protrude more than 15 mm beyond the last web, a PVC section (compatible with PLEXIGLAS®) such as INFILL SECTION 16 should be inserted to reinforce the edge. This ensures that the edge of the multi-skin sheet can be correctly installed in the glazing bar.



## Drilling

If drill holes are required, e.g. for cutting out corners, use twist drills with special bits for acrylic (which “scrape rather than cut”), conical or step drills.



## Corner cut-outs

If a corner needs to be cut out (e.g. to accommodate pipes, vents etc.), a hole should be drilled in the sheet at the point where the cuts intersect. To cut out corners, drill the hole first at the corner and then cut to it from the sheet edge, using a fine-toothed jig saw without pendulum stroke.



It is essential to perform machining under clean conditions. No one wants to see swarf when they look up at the finished roof. Once the sheet has been installed, it takes a lot of effort to remove such swarf.



#### **Cleaning the cut edges**

Any swarf clinging to the cut edges can be removed using a wire brush.



#### **Removing swarf**

Swarf that has entered the cavities of the multi-skin sheets can be removed with compressed air or a vacuum cleaner.





# Installation

The pictures show typical glazing systems.

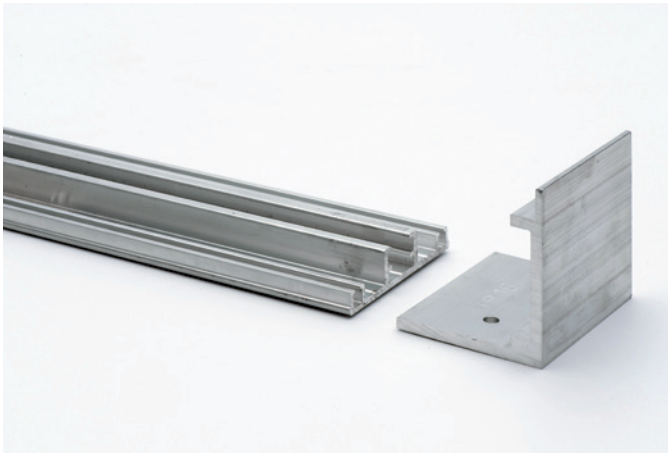
Whichever systems are chosen, take care to use only clamping bars, seals and other auxiliary agents and installation materials that are compatible with PLEXIGLAS®. This excludes plasticized PVC, paint solvents, degreasing agents and other corrosive media.

In case of doubt, or to obtain information on the compatibility and function of different glazing systems, please contact your PLEXIGLAS® distributor.



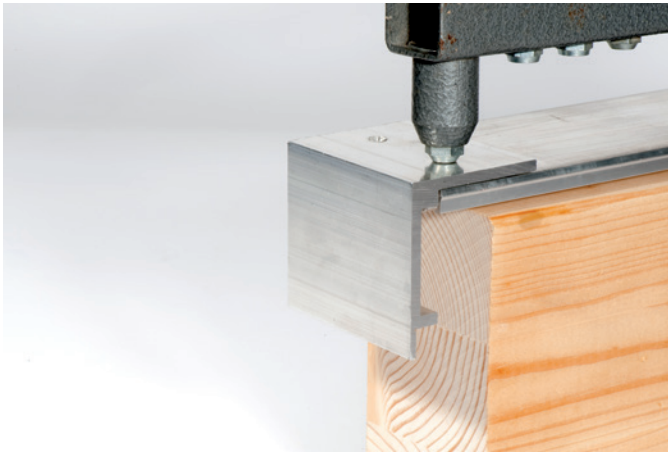
### Length of the glazing bar

The glazing bar must be at least the same length as the purlin.



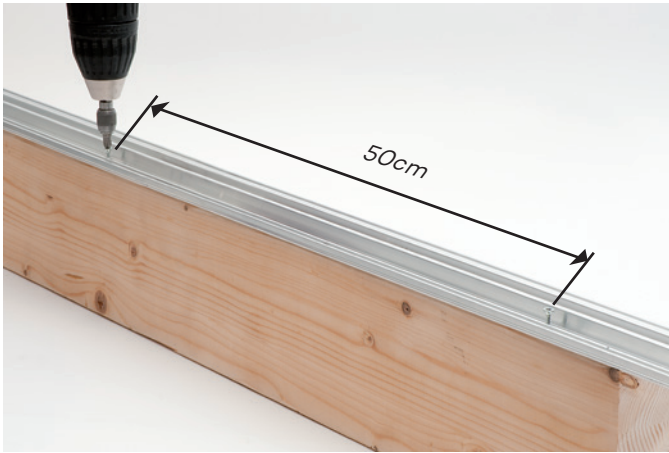
### Length of the glazing bar

The leg length (a) of the Aluminium Terminal Angle is usually added to the length of the purlin or glazing bar. This angle prevents the sheet from slipping.



### Fastening the terminal angle

The Aluminium Terminal Angle is fastened by means of rivets or screws before installing the glazing bar.

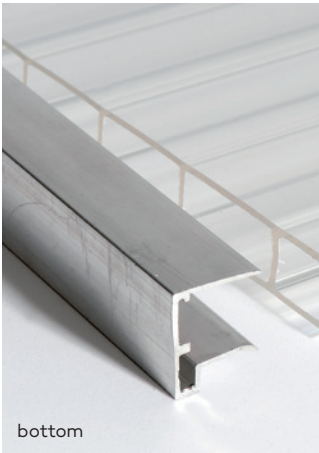


### Installing the glazing bars

The base sections should be fastened to the wooden or metal purlins by means of screws spaced approx. 50 cm apart. Suitable edge sections should be used for the roof edges.



top



bottom

### Closing the open ends of the multi-skin sheets

If the open ends of the multi-skin sheets are not protected on delivery by suitable end closure sections that prevent dirt, water and insects etc. from entering the cavities, they must be sealed before installation. A simple but very important rule applies for closing the open ends of the sheets: they should be sealed as tightly as possible at the top (Aluminium End Closure Section + adhesive aluminium tape) and as tightly as necessary at the bottom (only Aluminium End Closure Section).



### Walking on the roof

It is often unavoidable to walk on the roof when installing the sheets and glazing bars.

Roofing with PLEXIGLAS® multi-skin sheets should only be walked over by means of crawling boards that are at least 50cm wide. These protect the sheet and comply with occupational safety standards. Placing a non-slip blanket or such between the PLEXIGLAS® sheet and the board protects the sheet from scratching.





#### Installing the glazing bars

Suitable PVC edge sections or special base edge sections are used to close off the roof at the sides.



#### Installing the glazing bars

Depending on the chosen type of glazing system, the base and upper sections are connected using PVC spacer sections or are directly clipped on or screw-fastened. Cover sections, some of them colored, are available to conceal the heads of the screws.



#### Installing the glazing bars

The upper sections are fastened by means of suitable screws with washer. An aluminium cover section can be clipped on if desired.



#### Installing the glazing bars

Suitable screw-on wall connecting systems are available for roofs that touch the walls of the house. The sealing strips of these systems are incised at the points where they meet the glazing bars.



#### Installing the glazing bars

The wall connecting systems can be sealed at the wall using permanently flexible rubber. If butt joints and corners of glazing bars need to be sealed, e.g. using suitable silicone rubber, the latter must be compatible with PLEXIGLAS®. No vapors must be allowed to enter the sheet cavities.

PLEXIGLAS® distributors offer suitable sealing compounds.



#### Removing the masking film

The masking film is removed when all the PLEXIGLAS® multi-skin sheets have been installed.



#### Activating the AAA and NO DROP layers

The functional layer of PLEXIGLAS® multi-skin sheets with an AAA or NO DROP coating needs to be activated. This is done by rain, but it is better to wash down the sheets straight after installation (e.g. using high-pressure cleaning equipment with a wide spray nozzle).



# Cleaning/Material behavior in use



A PLEXIGLAS® roof offers its owner unalloyed pleasure. To make sure it stays that way, it is important to know a few things about the material's properties.

Always make sure to use only cleaning agents that are compatible with PLEXIGLAS®

(i.e.no strong industrial cleaning agents, insecticides, solvents or other corrosive agents).

In case of doubt or to receive information on the compatibility and function of different cleaning agents, please ask your PLEXIGLAS® distributor.



**Cleaning**

There is no need to clean the outside of the sheet, given adequate roof pitch and in vertical glazing. The rain will wash off any soiling. Should cleaning be necessary, use a garden hose or clear, warm water with a little added household dishwashing liquid. Do not use abrasive cleaning agents. Only use cleaning and auxiliary agents that are compatible with PLEXIGLAS®.



**Crackling noises**

Any crackling noises are due to physical, temperature-related expansion of the PLEXIGLAS® sheets. They are not a sign that the sheets have been damaged, but show that the sheet material is expanding in the normal way. This expansion has no effect on the functionality of the sheets, glazing bars or screw fastenings. In many cases, the loadbearing supporting structure made of wood or metal causes expansion noises, which the PLEXIGLAS® roof amplifies like a drumhead. These noises are significantly reduced by installing the sheets in rubber gaskets on all sides.



**Condensation**

Condensation is a natural phenomenon and is usually restricted to the eaves area.

PLEXIGLAS® is slightly permeable to gas and vapor. For these reasons it is practically impossible to seal the sheet cavities hermetically in the long term. Damp air that enters the sheets may therefore cause condensation and fogging of the cavities under certain weather conditions. This does not diminish the material properties or function of the sheets. If suitable vent holes are provided at the lower sheet ends, condensate can drain off or evaporate.



# Cleaning

A roof glazed with PLEXIGLAS® solid sheets offers its owner unalloyed pleasure. To make sure it stays that way, it is important to know a few things about the material's properties.

Always make sure to use only cleaning agents that are compatible with PLEXIGLAS® (i.e. no strong industrial cleaning agents, insecticides, solvents or other corrosive agents).



## Cleaning

There is no need to clean the outside of the sheet, given adequate roof pitch and vertical glazing. The rain will wash off any soiling. Should cleaning be necessary, use a garden hose or clear, warm water with a little added household dishwashing liquid. Do not use abrasive cleaning agents. Only use cleaning and auxiliary agents that are compatible with PLEXIGLAS®.

Suitable cleaning agents are

- lukewarm water with a little added dishwashing liquid
- concentrated vinegar diluted with water
- isopropyl alcohol (2-propanol)
- pure naphtha
- a soft, damp viscose sponge
- a soft, damp, non-linting cloth
- a sponge cloth
- chamois leather
- glove-lining fabric
- cotton dishcloth
- shower cabin squeegee with soft rubber blade
- damp microfiber polishing cloth (e.g. Vileda® Microclean)



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