SUNTUF® *Plus*

Corrugated Polycarbonate Sheets for Greenhouses

Installation Instructions

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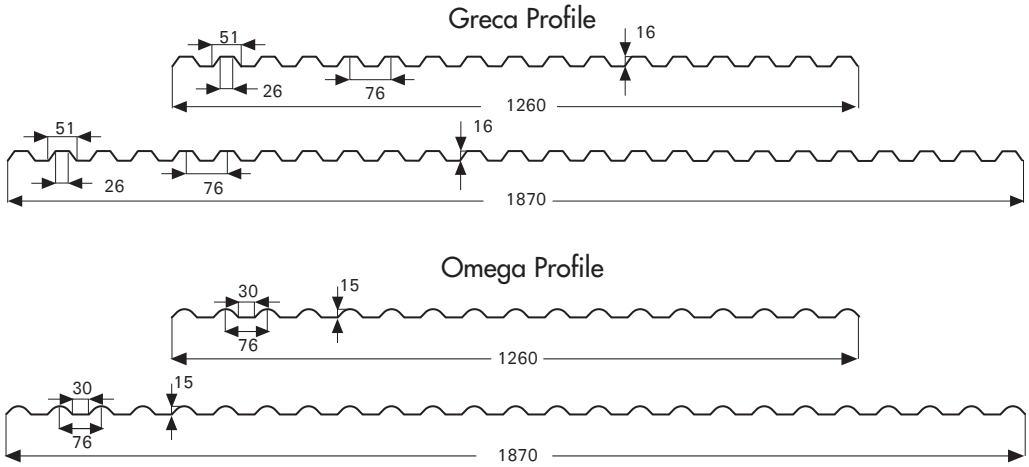
Profile Dimensions:

Distance between Corrugations (mm)	Width	Effective Width (mm)	Number of Corrugations	Wave Overlap	Percent Overlap
76	1260	1216	17	1	3.5
76	1870	1824	25	1	2.5



Distance between Purlins:

Profile	Sheet Thickness mm	Theoretical Weight kg/m²	Load kg/m²	Distance between Roof Purlins mm	Distance between Wall Purlins mm
Greca	0.8	1.2	90	1200	1200
			120	1100	
Omega	0.8	1.1	150	1000	

The dimensions depicted above do not supersede the requirements of local construction codes. The distances depicted above were calculated based on the structural properties with the following factors being taken into consideration: sheet sagging, potential wind load, potential snow load, hail and application load according to usual construction practice.
When designing a new roof, it is strongly recommended that the slope be above 10% (5.7°). (Consult your local Paltough representative when recovering an existing greenhouse whose slope is less than this value) The recommended maximum panel length is 7 m. The recommended maximum distance between the edge and first purlin is 900 mm or the value dictated by the design engineer. (See the drawing at the bottom of page 4.)

Calculate the number of sheets as follows:

1 - Divide the length of the roof (the length of the gutter) by the effective width of the sheet.

2 - Calculate the required length of the sheet (to be no greater than 7 m) according to the purlin to purlin distance plus the required extension beyond the first and last purlin or overlap distance.

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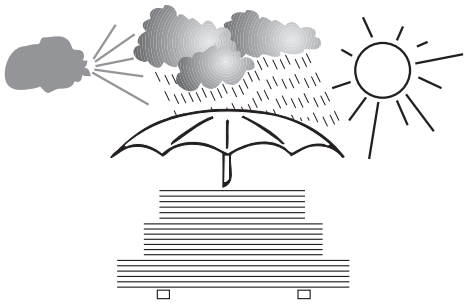
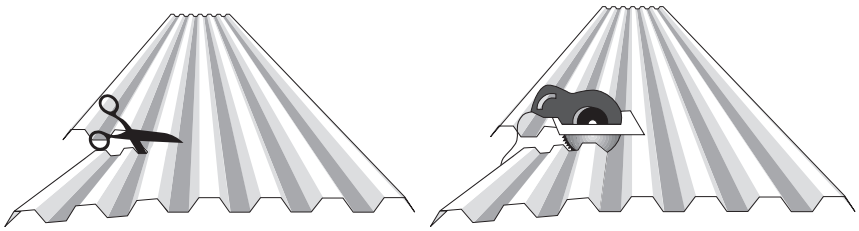
Handling and Storage:

SUNTUF PLUS sheets must be transported and stored horizontally on a flat, sturdy pallet whose dimensions are equal to or larger than the sheets. The sheets must be secured and fastened to the pallet. It is possible to store sheets of smaller dimensions on top of sheets that are larger. (Never store sheets of larger dimensions on top of smaller sheets!) The pallet must be stored in a cool and shaded location. Important: Never cover the pallet with, or place on the pallet, materials that are good conductors of heat (e.g. metal, pipes, clear or dark objects). In cases where it is necessary to store the pallet outdoors, it is possible to cover it with a white opaque polyethylene sheet, carton, or any other material that does not absorb or conduct heat. The total pallet must be covered.



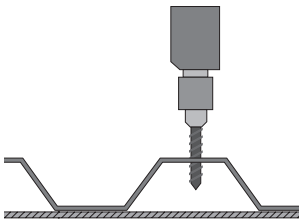
Cutting:

It is possible to cut SUNTUF Plus sheet using a disc saw with small teeth rotating at a high speed, taking care to advance the saw slowly. It is also possible to use a portable electrical saw (Jig Saw) or shears for cutting metal sheet. It is important to support the sheet in the vicinity of the cut and to clean away the dust generated by cutting.



Drilling:

Drilling should be carried out with drill bit intended for metal. The hole diameter must be 2 mm greater than the diameter of the screw. It is important to support the sheet in the vicinity where the sheet is being drilled. The dust generated by drilling must be cleared away before the insertion of the screw.



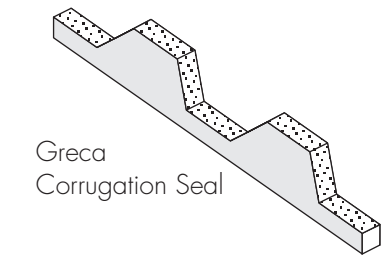
Sealing and bonding:

Corrugated sealing tape should be placed between the sheets and purlins to prevent the entry of wind or animals between installed sheets. A seal between the sheet and the purlin at the edge of the roof can be created using a sealing strip in the form of the profile. This is held in place by the same screw used to fasten the sheet to the purlin. The sealing strip should be manufactured from cross-linked polyethylene foam (XPE).

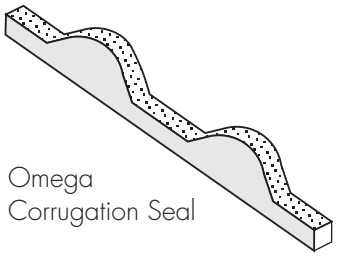
Silicone - Paltough Industries recommends using either Dow Corning 3793 (white) or Novasil S-64 from Otto Chemie (white).

Do not use other silicone materials that may be incompatible with polycarbonate.

The laboratory of Paltough Industries will evaluate a submitted sample of any silicone to determine whether it is compatible with polycarbonate.



Greca
Corrugation Seal



Omega
Corrugation Seal

Warning - Do not use any finishing compound or other chemical that is not on the approved list appearing in this document. (When in doubt feel free to contact your local distributor or Paltough Industries.)

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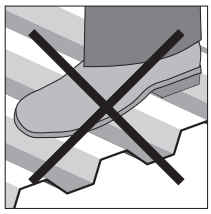
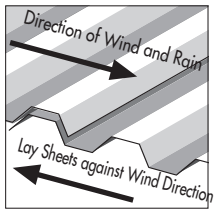
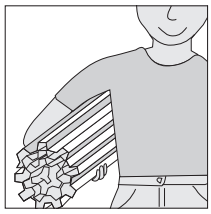
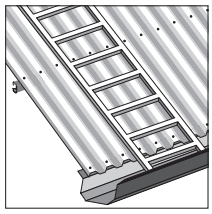
Positioning of Sheets:

Only one side of each SUNTUF Plus sheet is UV protected. This side must always face out toward the sun. The UV protected side is indicated by a sticker or polyethylene strip along the length of the sheet. The sticker of polyethylene strip must be removed immediately after the sheet is installed.
The sheets should be laid down on the roof or set upon the wall against the primary direction of rain. Stepping ladders and other devices required for safe work should be used.
Do not step on the panels between purlins. Never leave panels untended until all the required screws have been tightened.
SUNTUF Plus sheets are light-weight. The sheet can be rolled in a direction perpendicular to the length of the corrugations for the purpose of lifting them to the roof.





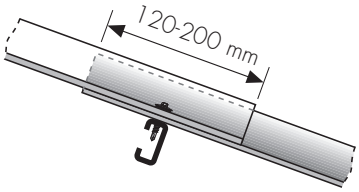




Overlap:

Length overlap

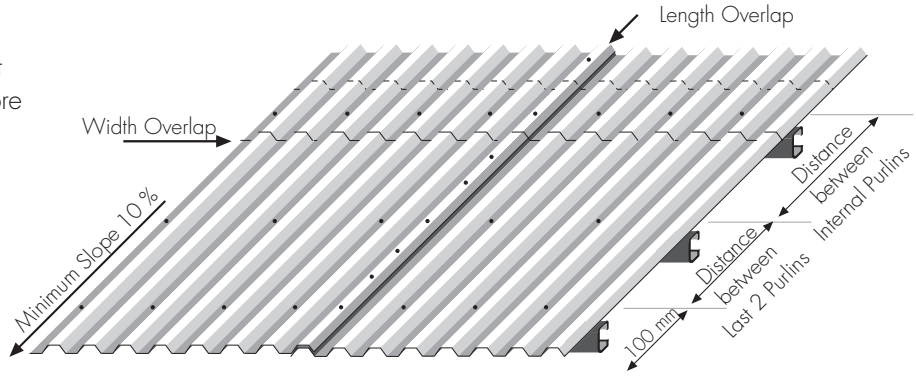
One corrugation of the upper panel covers one corrugation of the panel below.



Width overlap

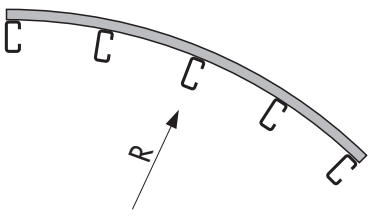
Minimum overlap - 120 mm
60 mm from the end of each sheet to the last line of screws.
Maximum overlap - 200 mm

At the edge of the roof, the sheet must not extend beyond the last purlin by more than 100 mm.



Arching Radius:

When covering rounded or arched greenhouses, it is possible to rest the sheets so that they will arch within the range of elasticity of the sheets without inducing stress. The required minimum radius of the arch created is 6.00 m for the Greca Profile and 3.00 m for the Omega Profile.



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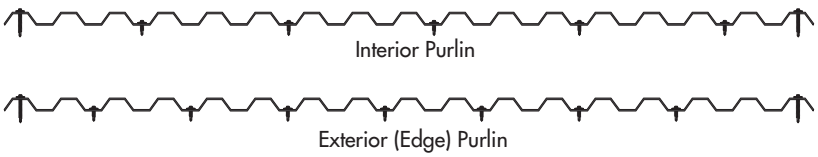
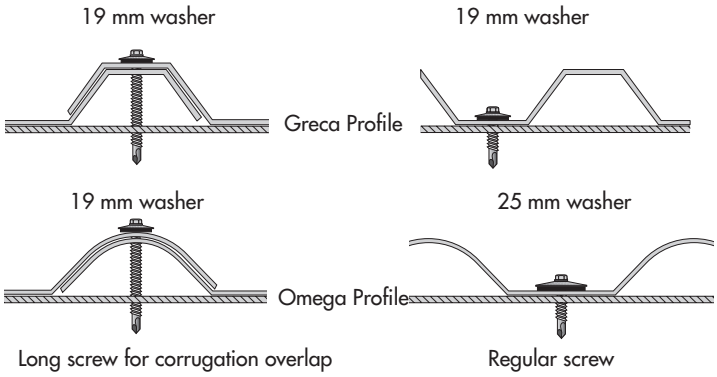
Fasteners Location:

A screw should be fasten each third corrugation valley into each interior purlin. A screw should be fasten through each sacond corrugation valley into each exterior purlin.

Along the lenghth overlap insert a screw into each purlin into the corrugation crest. It is recommended to drill a hole whose diameter is 2 mm greater than the screw diameter.

It is recommended that a variable speed electrical screwdriver with clutch be used. All screws must be inserted perpendicular to the purlin. Do not over-tighten the screws or deform the washer (see figure alonside).



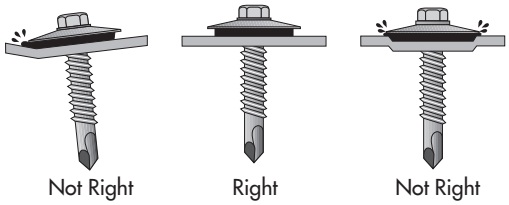


Screws:

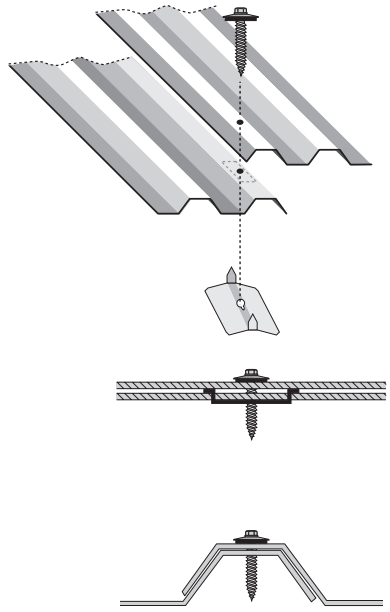
Screws placed into corrugation valleys are 1/4"X1" (6.3 x 25 mm). Screws placed into the crest of a corrugated are 1/4 X 1 1/2" (6.3 X 35 mm). The screws above should be either No. 12 or 14. Each screw should be fitted with a galvanized metal washer of a thickness no less than 1 mm. A rubberized washer manufactured from neoprene rubber or EPDM should be attached below the metal disk, whose thickness should be no less than 2 mm.

Recommended diameter of washers:
Greca Profile - 19 mm in all cases
Omega Profile - 19 mm where screws are inserted into the corrugation crest.
25 mm where screws are inserted into the valley of the corrugation

It is recommended to drill preliminery hole of 8 mm in the sheet, at the last line of screws.
In case of wooden purlins it is recommended to use special screws for wood.



Panel to Panel Overlap Fasteners:



These fasteners are inserted to create a seal between overlapping sheets between purlins. Where the slope of the roof is less than 15% (5.7°), one should be inserted into the corrugation crest every 40 cm. For roofs where the slope is greater than 15%, it is possible to place the fosteners every 50 cm.
One type of fastener consists of a rectangular washer with a hole in the center and two teeth, one at each end along the center of the short sides. A fastening screw (No. 8 X 1/4") penetrates through the sheets from above grasping the washer from below without pre-drilling (see drawing). Another consists simply of a 1/4" x 3/4" screw which is inserted directly into the overlapping corrugations and fastens the sheet.
Care must be taken to assure that the sheets touch each other along the entire length of the overlapping corrugation. All screws must be inserted into a metal washer followed below by a rubberized washer consisting of neoprene or EPDM. The washers sit directly below the screw head above the sheets.

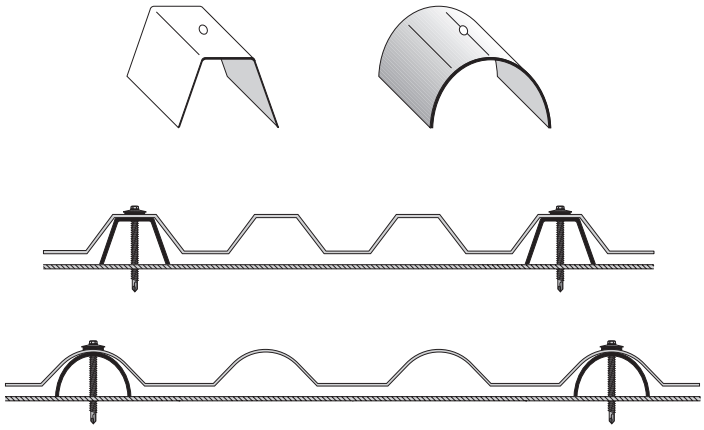
Use of Shading Compounds:

It is possible to apply shading compounds to SUNTUF Plus sheets.

Do not apply mixtures, which contain components that may attack polycarbonate.
If there is any doubt, consult your SUNTUF Plus distributor who can advise you in the proper use of shading compounds. You can request a compatible formulation that was developed by Paltough Industries.* Note that this formulation will be washed away by a rainstorm.

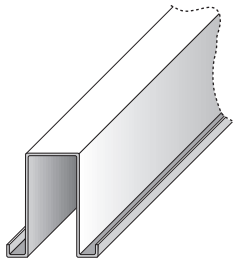
Shading compounds should be removed using a stream of water in conjunction with brushing with a soft bristled brush or rubbing with a soft cotton (only cotton) rag.

Additional Accessories:



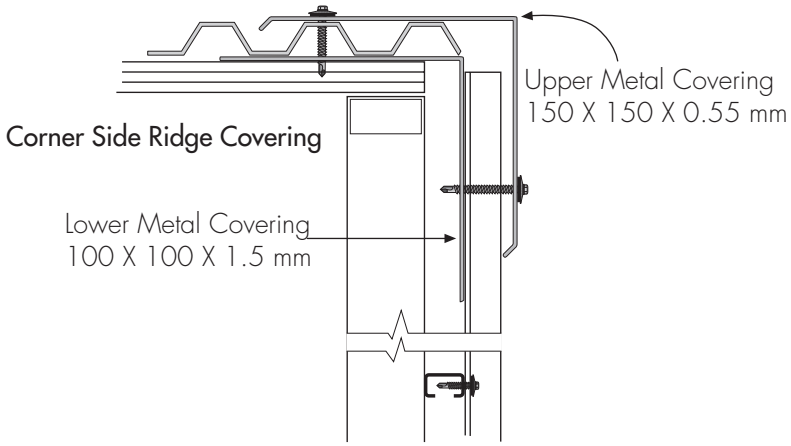
Special Profile to Elevate Sheets at Purlin to Avoid Condensation Drip

To avoid condensation drip from purlins, it is possible to use a special accessory having the form (⊓) 20 mm high and 30 mm long. This raises the sheet above the purlin and permits condensation drainage to the edge of the sheet. To utilize this accessory, all screws must be inserted at the crest of the corrugation through the accessory and into the purlin.



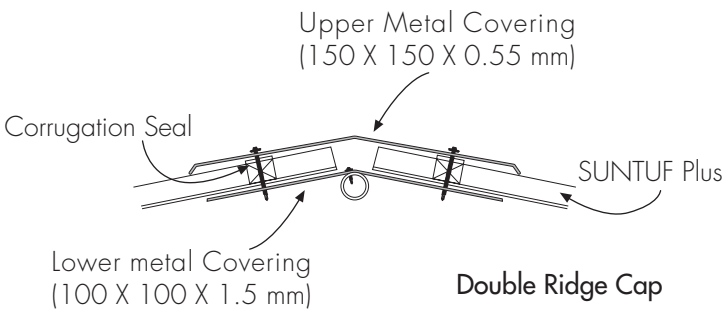
Purlin for Condensation Collection

It is possible to build the greenhouse (consult your greenhouse supplier) utilizing special purlins of omega design that aid in condensation collection and prevent condensation drip from the purlins. Care must be taken to construct the greenhouse with a devise that will carry off the collected condensation at the edge of the purlins.



Corner Side Ridge Covering

To close the structure at the corner where the roof meets two walls at a corner, a double galvanized metal covering is used.
The lower portion of the covering, 100 X 100 X 1.5 mm, is used to attach the sheet to the walls. The upper portion, 150 X 150 X 0.55 mm, is fastened to the roof.



Ridge Cap

(for the peak of the greenhouse roof) Solutions for providing a protective ridge cap can be provided by the designer of the greenhouse. If no solution was provided, you are invited to consult with your Paltough Industries representative,

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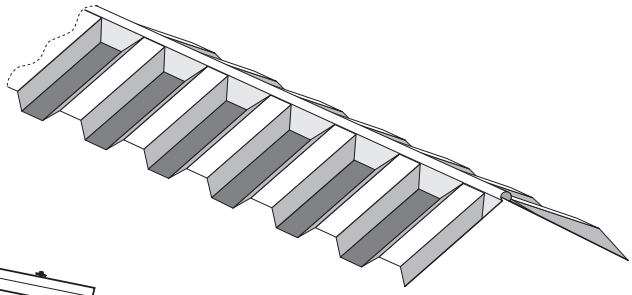
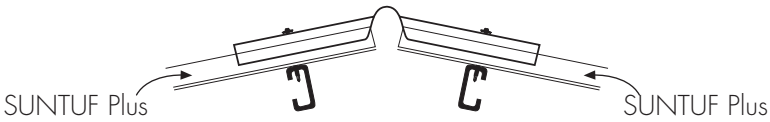
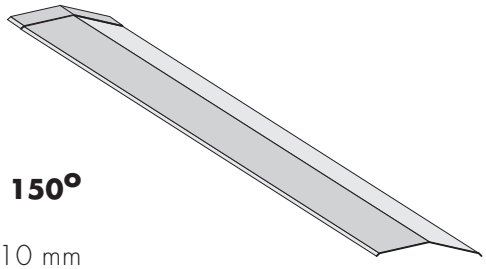
Standard Suntuf Accessories:

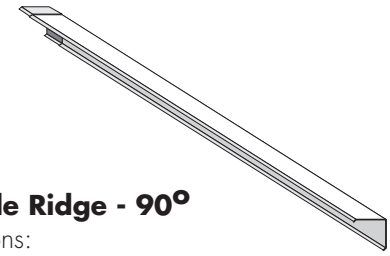
Greca Profile Universal Ridge Cap
(Omega Profile Universal Ridge Cap, not shown, also available)
Dimensions: 2280 x 150 x 150 mm
Number of Corrugations: 30
Net Length: 2204 mm



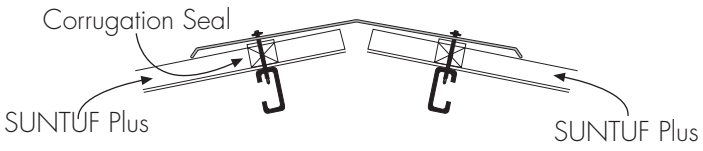


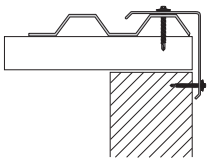


Flat Ridge Cap 150°
Dimensions:
2500 x 210 x 210 mm
Net Length: 2400 mm



Flat Side Ridge - 90°
Dimensions:
2500 x 160 x 160 mm
Net Length: 2400 mm





* - All the above materials may be purchased from Paltough Industries and its distributors.

Web Site: http://www.paltough.com

PALRAM Industries

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