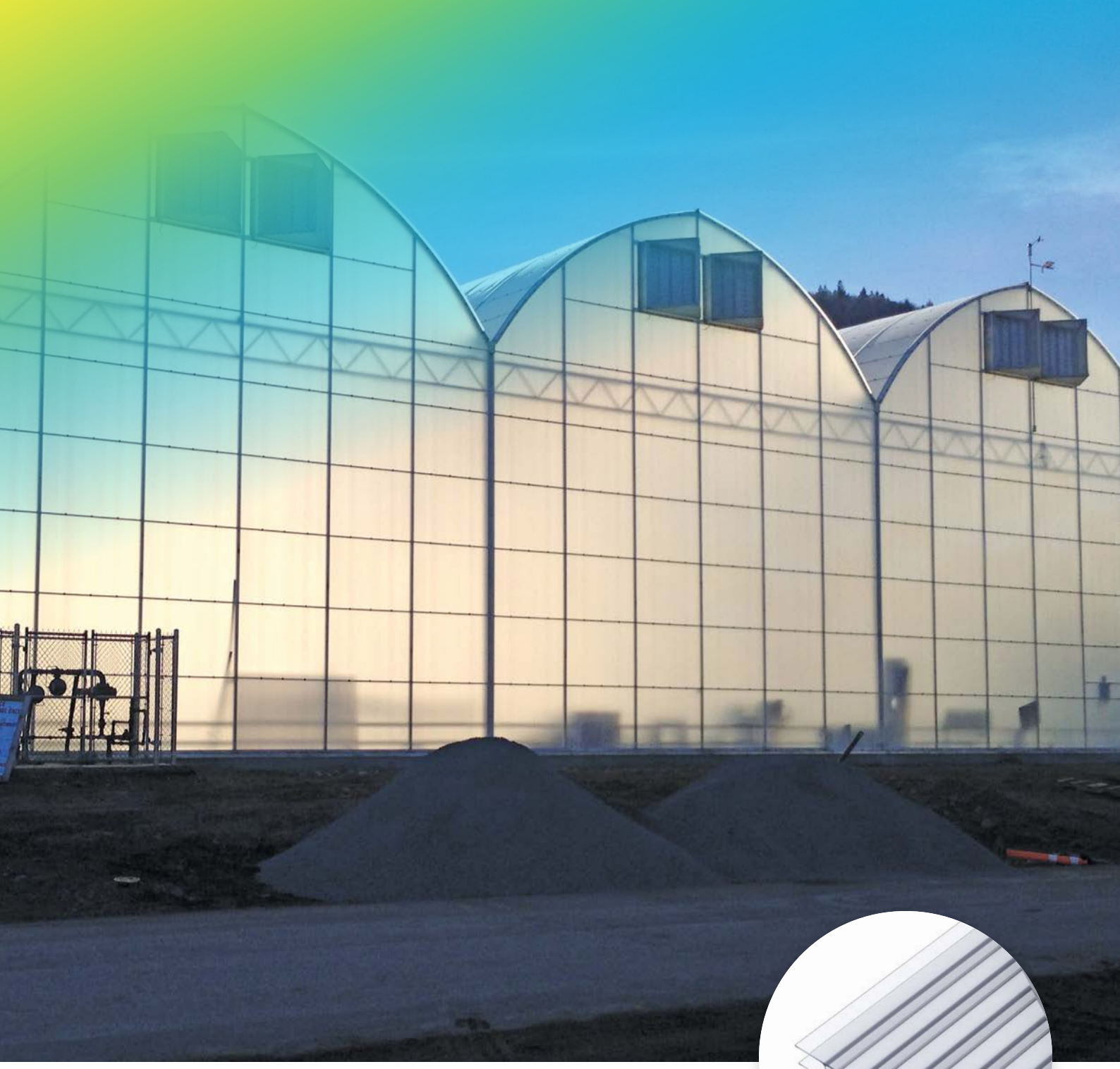


SUNLITE® Plus Installation Guide

Condensation Control Multiwall Polycarbonate sheet

PALRAM

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Profile Dimensions

Structure	Thickness		Weight		Width		Length	
	[mm]	[inch]	[gr/m²]	[psf]	[mm]	[inch]	[m]	[ft]
Twin Wall	6	1/4	1,300	0.27	980 1,050 2,100	48* 72*	2.0 - 12.0**	6.6 - 39.4**
	8	5/16	1,500	0.31				
	10	3/8	1,700	0.35	980 1,050 1,250 2,100			
Triple Wall	8	5/16	1,700	0.35				
	10	3/8	2,000	0.41				

* Standard width supplied in the USA.

** Due to thermal expansion, the recommended maximum length is 7.0m (23ft.).

Distance Between Purlins

Structure	Thickness		Weight 10psf		70 kg/m2 10psf		100 kg/m2 10psf		125 kg/m2 10psf		125 kg/m2 10psf	
	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
Twin Wall	6	1/4	800	32	700	27	650	25	620	24	600	24
	8	5/16	1000	39	900	35	800	32	750	29	735	29
	10	3/8	1250	49	1080	42	940	37	900	35	875	34
Triple Wall	8	5/16	1080	42	980	38	880	34	820	32	760	30
	10	3/8	1350	53	1150	45	1050	41	1000	39	950	37

Notes:

1. The above specified spans do not supersede the requirements of local construction codes. The spans above are based on the structural properties with the following factors being taken into consideration: sheet deflection, potential wind load, potential snow load, hail, and application load according to common construction practice.
2. The data is based on a maximum deflection of 1/20 (5%), of the span, using continuous multi-spans supports.
3. When designing a new roof, it is strongly recommended that the slope be above 10% (5.7°). (Consult your local PALRAM representative when re-covering an existing greenhouse whose slope is less than this value).
4. The recommended maximum distance between the two top purlins and between the two bottom purlins is 900 mm (35") or the value dictated by the design engineer. (See Figure 9 on page 5).

Calculate the number of sheets as follows:

1. Divide the length of the roof (the length of the gutter) by the width of the sheet.
2. Calculate the required length of the sheet (not greater than 7.0 m or 23 ft.) according to purlin to purlin distance plus the required extension beyond first and last purlin.

Handling and Storage

- SUNLITE Plus Multi-wall sheets must be transported and stored horizontally on a flat, sturdy pallet whose dimensions are equal to or larger than the sheets themselves. The sheets should be secured and fastened to the pallet. It is possible to store sheets of smaller dimensions on top of larger sheets of the same type. (Never store sheets of larger dimensions on top of smaller sheets!) SUNLITE Plus sheets 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, cover it with a white opaque polyethylene sheet, cardboard, or any other material that does not absorb or conduct heat. The whole pallet package must be covered.

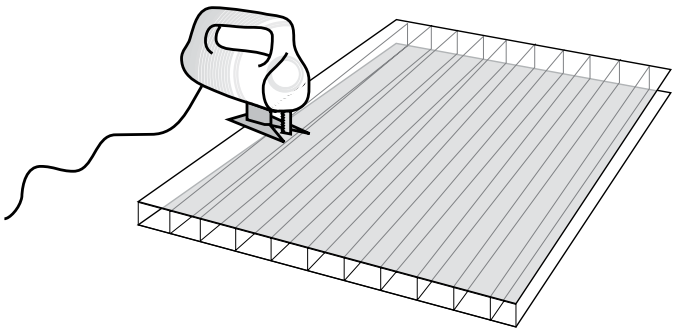
Figure 1



Cutting

It is possible to cut SUNLITE Plus sheets using a circular saw with small teeth, rotating at a high speed, taking care to advance the saw slowly. It is also possible to use a portable electric saw (Jig Saw). It is always important to support the sheet in the vicinity of the cut, and blow away the dust and debris generated by cutting.

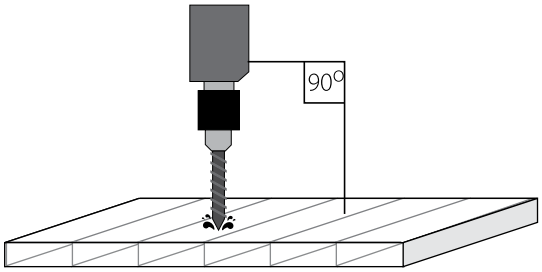
Figure 2



Drilling

- Drilling is performed best with a drill bit intended for metal. The hole diameter must be 4mm (5/32") greater than the diameter of the screw to be used. It is important to support the sheet in the vicinity of the hole being drilled. The dust generated by drilling must be blown away before the insertion of the screw.
- Special attention should be given to drill holes perpendicular to the sheet face.

Figure 3

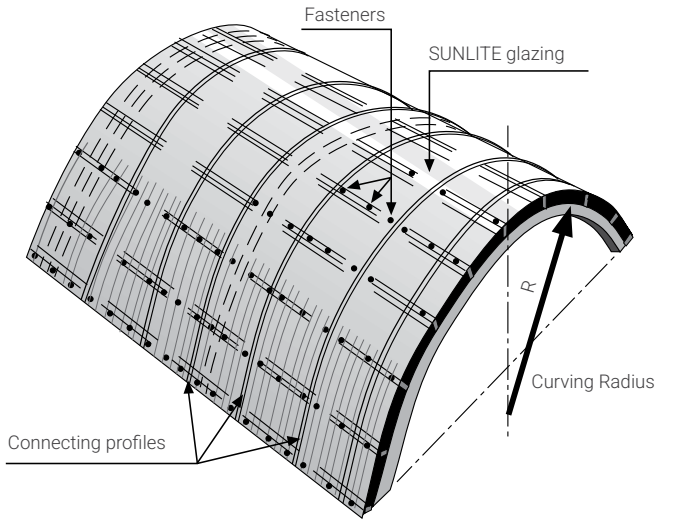


Arching Radius

SUNLITE Plus sheets may be cold-curved down to their minimum permitted radius, using polycarbonate's natural properties. Curving SUNLITE Plus sheets beyond this minimum permitted radius induces undue stresses and strains in the glazing sheet, which would cause premature failure and therefore void the warranty.

Structure	Thickness		Minimal permissible curving radius	
	[mm]	[inch]	[mm]	[inch]
Twin Wall	6	1/4	1,050	40
	8	5/16	1,400	55
	10	3/8	1,750	70
Triple Wall	8	5/16	1,760	69
	10	3/8	2,200	87

Figure 4



Preparations for Installation

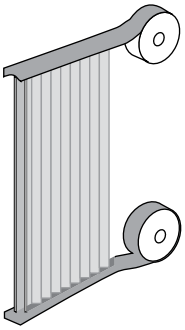
- As a rule, it is recommended to install SUNLITE sheets at mild or warm temperatures in order to reduce thermal expansions to a minimum.
- Peel off the masking tape and protective film from both open ends of the sheet to about 75-100mm (3-4 in.) from the ends of the sheet, to enable taping by the aluminum sealing tape. Tape the sealing tape straight along the open-ends, so that it will cling well and evenly to both faces of the sheet, making sure that all the open ends of the rib channels are properly sealed.
- Peel off the prrotective film along both sides of the sheet, for about 75-100 mm (3-4 in.) from the edges, preparing the sheet for insertion into the connecting profiles.
- Remove the internal face protective film just prior to the actual installation on the roof. Removing the protective film prematurely may result in damage to the sheet during handling and installation.
- Remove the external face protective film as soon as the installation of the whole glazed area is completed, or very shortly afterwards. Failing to do so, would expose the protective film to direct sunlight, causing difficulties in removal due to deterioration of the film, and void the warranty.
- Before installing the U protective end cap onto the ventilated filter tape, at the bottom of the sheet, it is necessary to drill in it 6mm (1/4") weep holes, 200mm (8") from each other, for securing proper drainage (Fig. 5c). To maintain the sheets' clarity, ensure free drainage off the weep holes.
- 7. Please note: In case of curved installation, where both open ends are situated at the bottom, apply ventilated tape at both ends.

Figure 17a



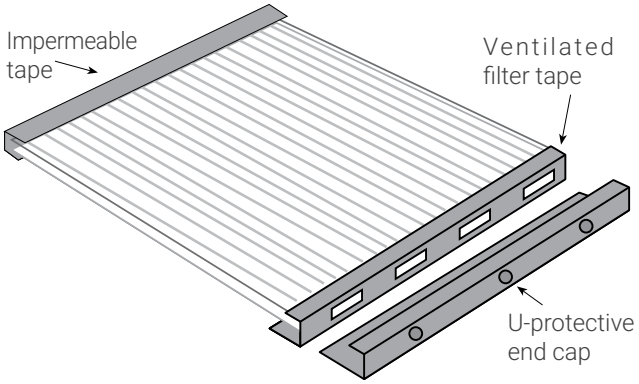
Partial or Complete Removal of Protective Film Prior and after Installation

Figure 17b



Installation of Sealing Tape on Open Ends of Sheet

Figure 17c



Installation of Impermeable Tape at Top of the Sheet and Installation of Ventilated Tape at the Bottom of the Sheet

Positioning the Sheets

- Only one side of a standard SUNLITE Plus sheet is UV protected*. This side must always face out toward the sun. A printed protective film cover indicates the UV protected side. This protective film must be removed immediately after the sheet is positioned in place.
- The sheets should be installed with the rib channels in the direction of the slope (Fig. 6), vertically in wall covering, or following the direction of the arched rafters (Fig. 4) in arched roofs.
- This will reduce accumulation of dirt and ease gravity drainage of condensation moisture inside the sheet.
- Do not step on the sheets. Always use stepping ladders or crawling boards to distribute weight (Fig. 7).
- Never leave sheets untied on the roof or around the working site, unless all required fastening clamps or screws are properly secured.

* SUNLITE UV2 is optional and requires a special order.

Figure 6

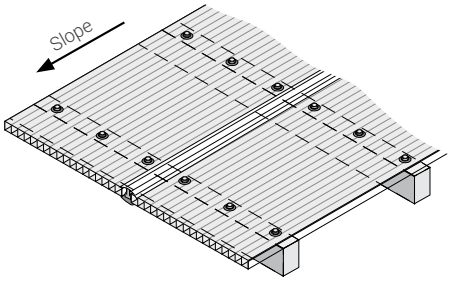
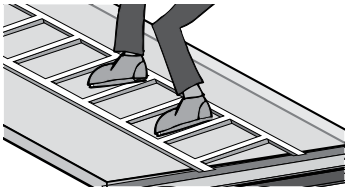


Figure 7



Avoid stepping on the sheets - use stepping ladders.

Fixing of Roof and Wall Sheets

For safety reasons, we recommend to avoid installing SUNLITE sheets on windy days.

- The SUNLITE Plus sheets are laid on top of the purlins, with rib channels directed down the slope, perpendicular to the purlins. The span between purlins is determined by the load and deflection characteristics of the specific SUNLITE Plus sheet (Page 2, Table 2).
- The sheets are connected to each other by polycarbonate 'H' profiles, or Base & Cap pairs of polycarbonate or aluminum profiles: A lower base profile (See Figure 8), generally the more rigid of the two profiles, on which the edges of the adjoining sheets are placed. (It is not to be fastened to the purlins). The cap profile clips onto the base profile by hand pressure, holding both sides of the adjoining sheets in place by mechanical pressure. (Fig. 8).
- The sheets have to be fastened to the purlins by fastening screws, inserted along the supporting purlins, spaced about 500 mm (20 in.) apart. (Fig. 9).
- Along the edge purlin (or gutter), the fastening screws should be inserted about 300mm (12in.) apart. (Fig. 9).
- An electric screwdriver with an adjustable clutch should be used to tighten the screws. Excessive tightening may harm the sheets and cause premature failure (Fig. 10). Pay attention to insert the screws perpendicular to the sheet face.

Figure 8

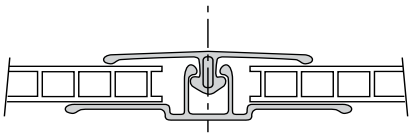


Figure 9

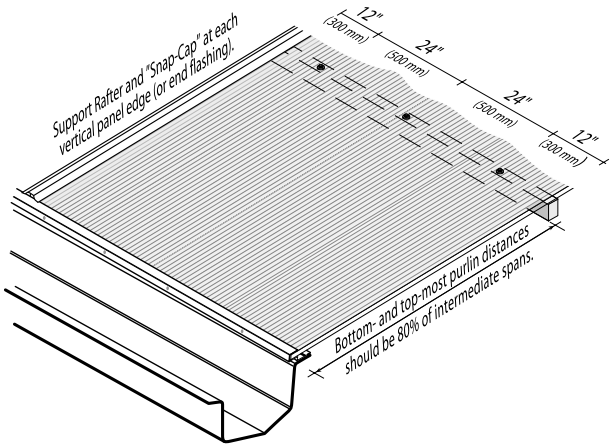
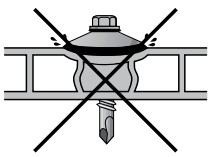
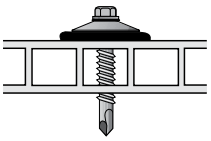


Figure 10a



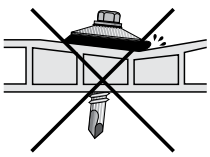
INCORRECT - Overtightening

Figure 10b



CORRECT

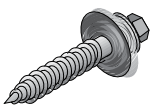
Figure 10c



INCORRECT - Non-perpendicular drilling and insertion

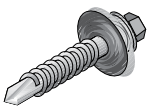
- Use of self-tapping or self-drilling screws is recommended. In case of wooden structures, suitable wood-screws should be used. All the screws should be corrosion resistant, with at least a heavy-duty hot-dipped galvanized finish. The recommended screw diameter is 6.3mm (1/4 inch). Screw length is selected according to sheet thickness, type of washer, and supporting purlin. In wooden purlins, a minimum of 1 in. insertion of full-size active threads must be secured. In metal purlins, full-size active threads must show-up after fixation, at the internal face of purlin.

Figure 13a



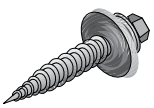
Self-tapping screw

Figure 13b



Self-drilling screw

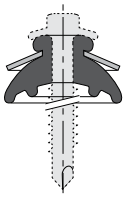
Figure 13c



Wood screw

- Each screw should be fitted with a corrosion resistant steel washer, at least 1 mm (0.04 in.) thick, with a specially shaped integral 25 mm (1 in.) diameter EPDM rubber gasket.
- It is recommended to pre-drill in the sheets into each screw location. The diameter of that hole should be 2mm (5/64") larger than that of the screw, to allow for thermal expansion movements.

Figure 13g



25mm special washer/gasket

Chemical Resistance and Compatible Sealants

- SUNLITE Plus sheets are resistant to a variety of chemicals, while exhibiting limited resistance to a second group of chemicals. A third group of chemicals will attack and cause irreversible damage to the sheet. The degree of damage will depend on the specific material and time of exposure.
- Choose only sealants and adhesives which are compatible with SUNLITE sheets.
- Never install the sheets on wet paint that may contain solvents that damage the polycarbonate sheets.
- Use of sealants or adhesives not included in PALRAM's recommended list must receive the Manufacturer's explicit approval. This can be obtained through your distributor. Use of materials not on the list, or which have not received the Manufacturer's explicit approval, may harm the sheet and will void all warranties for the performance of SUNLITE Plus.
- For external shading compounds see "Use of Shading Compounds" chapter below.
- Your local distributor can provide additional information and forward other non-referenced materials that you may present, to evaluate their compatibility with SUNLITE Plus.

Sealing

- Compatible silicone sealants recommended for use with SUNLITE sheets:

Manufacturer	Sealant
Sealant	MS Clear
Bison	MS Clear

- For other materials please consult the Palram website www.palram.com, or your PALRAM distributor.

Figure



Use of Shading Compounds

- pply only recognized commercial brands of shading compounds to SUNLITE Plus sheets, which are explicitly confirmed to be compatible with polycarbonate. Do not apply dubious mixtures that may contain incompatible components, which will attack and damage the sheets.
- In case of doubt, consult your SUNLITE Plus distributor, who can advise you on the proper use of shading compounds.
- You may ask for recommendations on compatible formulations that were tested and confirmed for use by PALRAM Industries. Note that all the recommended formulations are water-soluble and will eventually be washed away by rains.
- Shading compounds should be easily removed using a strong water jet in conjunction with wiping with soft cotton rags.

Accessories

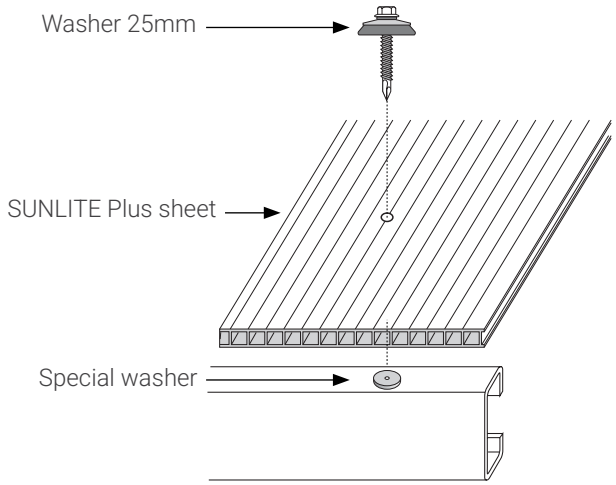
Special no-drip spacer washer

To avoid condensation drip from purlins, it is recommended to use a special adhesive-backed spacer washer 32 mm (11/4") diameter, placed between purlin and SUNLITE Plus sheet, stuck to the purlin at the fastener point.

Purlin for condensation drainage

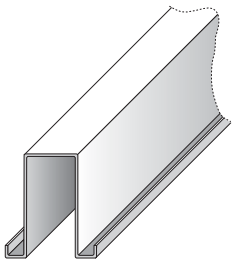
- It is recommended to use a special Omega shaped purlin for the greenhouse roof structure (consult your greenhouse supplier), for condensation drainage, preventing dripping from the purlins.
- An aluminum collecting profile should be installed on top of every supporting truss or beam for collecting and draining the condensed water gathered in the Omega purlins' channels, leading them into the main side gutters.

Figure 14



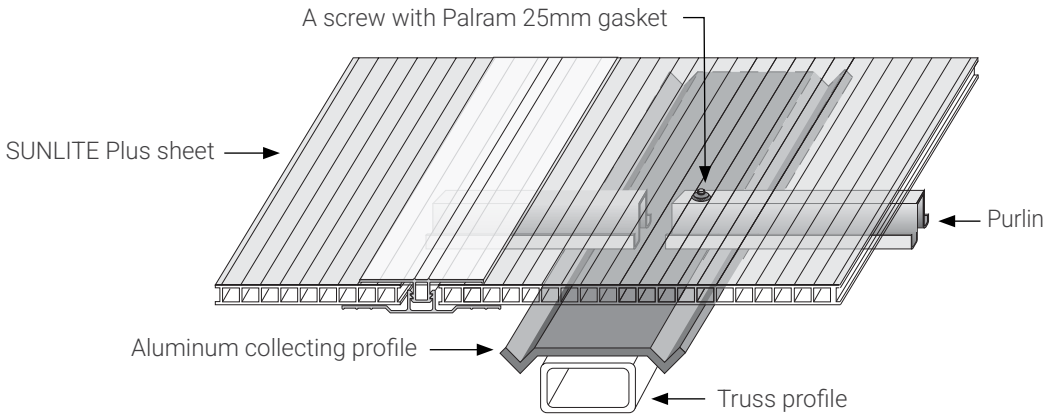
SUNLITE Plus assembly

Figure 15



Collecting omega purlin

Figure 16



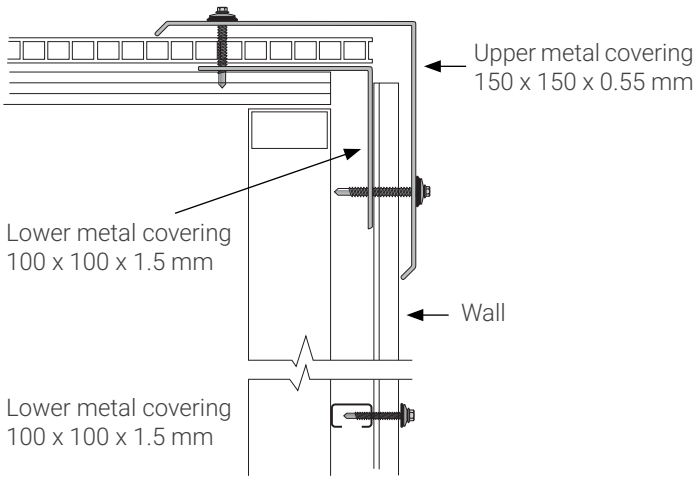
Truss drainage channels

Corner Side Ridge Closure

To close the struc ture where the roof meets the gable, or a vertical closure between two walls meeting at the corners, two adjoining galvanized sheet-metal profiles are used. (Fig. 17).

- The internal "L" shaped 100x100x1.5mm (4x4x0.06 in.) profile is used to attach both edges of the cladding sheets to the structure.
- The external L shaped, 150x150x0.55mm (6x6x0.02in.) flashing is fastened to the internal L profile at the roof edge and top end of the gable, or at the greenhouse corners.

Figure 17



Corner side ridge covering

General Recommendations

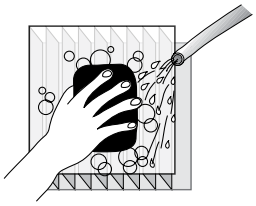
Cleaning

- Self-cleaning by rains is usually sufficient. Local small areas may be washed using diluted household detergents. Make sure the detergent contains no abrasives or solvents. Wash with hot water and soft cloth.
- Heavy oil stains can be removed with an isopropyl alcohol watery solution.
- Avoid dry cleaning, the dust particles clinging may scratch the surface and damage the sheet.
- Large areas may be washed by high-pressure water jet, possibly adding a mild compatible detergent, and/or a steam jet.

Safety Measures

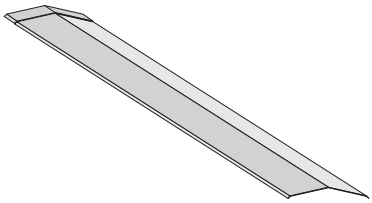
- When installing SUNLITE Plus or doing maintenance works, always use stepping ladders or crawling boards, supported by the roof structural elements.
- Never step on SUNLITE Plus sheets between the purlins. In emergency, step only on the line of purlins.

Figure 21

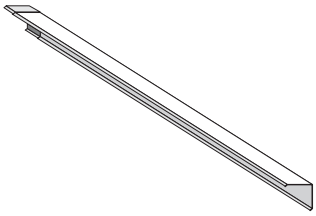
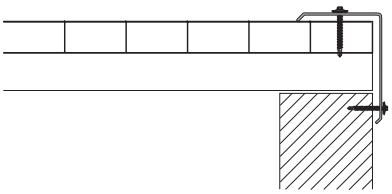


Ridge Metal Profiles

Optional Ridge metal profiles are presented below.
Contact your PALRAM dealer for more information on items and their availability.

Figure 19a	Figure 19b
	

Flat Ridge Cap 130°
Dimensions: 2500 x 210 x 210 mm
Net length: 2400 mm

Figure 20a	Figure 20b
	

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

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