

### D. "Roofing and Cladding" Installation Method:

This is a simpler, more practical method, resembling the one used for single-wall, corrugated plastic (or metal) sheets. It employs longer strips, with wider dimension. Length is as long as possible without excess deformation by thermal expansion. SUNLITE sheets are laid on top of the purlins, with rib channels directed down the slope, perpendicular to the purlins. Span between purlins is determined by the load and deflection characteristics of the specific SUNLITE sheet.

1. The sheets are connected to each other by long connecting elements.

2. The wide variety of these connection methods falls into two main categories: "wet" or "dry" installation systems. The connecting elements (made of aluminum, sheet metal or plastic- rigid PVC or polycarbonate) are designed as connectors, not as load supporting members. They connect the sheets to each other, achieving one unified watertight exterior shell. Additional strength and rigidity achieved through them is an added bonus.

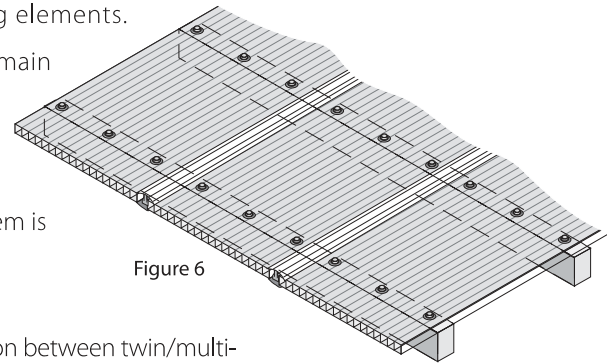


Figure 6

#### a. A basic inverted "H" polycarbonate connecting profile:

An old and simple form enabling a lengthwise (side by side) connection between twin/multi-wall sheets. It is sometime offered with a specific size profile for each sheet thickness, or in versatile, more flexible design enabling the use of one profile with 2 consecutive thicknesses (4-6 & 8-10 "H" profiles). This connecting method is practically inappropriate for the thicker SUNLITE panels.

1) "Dry" method: The edges on both sides are inserted into the profile, holding the sheets by "dry" mechanical friction, with the sheets on both sides fastened to the structure, along the purlins, by fixing screws, about 500-600 mm (20-24 inches) apart.



Figure 7. Basic, inverted H polycarbonate connecting profile

2) "Wet" method: both the profile channels are half-filled with silicone, which acts, after installation and curing, both as sealer and adhesive. It may offer better weatherproofing at shallower slopes, than the "dry" system, but is very difficult to install properly and cleanly (Figure 7).

#### Notes:

a) The connector itself is not fixed to the purlins.

b) Both systems are basic and disclose several shortcomings: difficult and bothersome installation, plain looks, weak and imperfect connection and sealing. Installation may prove to be lengthy and messy for inexperienced hands. They are, however, considered the cheapest.

c) We would limit the use of "H" connector system to vertical, short sheets, as in wall cladding or windows.

#### b. A two-part polycarbonate connecting profile comprised of:

1) A lower base profile, usually the more rigid of the two, on which the edges of the adjoining sheets are placed. Usually the base profile is fastened to the purlins by screws through the middle, with both edges free, letting the sheets slide easily due to the thermal expansion and contraction process.

2) The upper part, usually more flexible than the base, clips on the base profile by hand pressure, holding both sides of the adjoining sheets in place by mechanical pressure.

This type is easier to install, more reliable in holding the sheets and sealing the connection. It is used, mostly, in "dry" installation, but could be assisted by silicone on the upper and lower profile. "Wet" installation like this is difficult to keep clean during installation and with long sheets may lose its effectiveness due to excessive expansion.

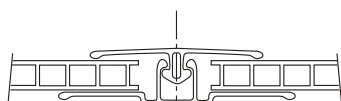


Figure 8a

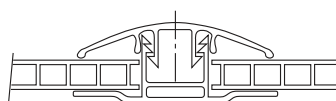


Figure 8b

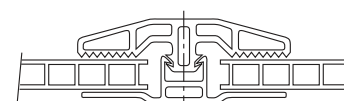


Figure 8c

Figure 8. Drawing of typical two-part polycarbonate connecting profiles currently used

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- 3) Along the edge purlin, the fastening screws should be inserted about 300 mm (12 in.) apart.
- 4) A hole must be pre-drilled into each screw location. The diameter of that hole should be 2 mm larger than that of the screw, to allow for thermal expansion movements. In case of dark colored sheets predrill even larger holes, and use wider fastener washers.
- 5) An electric screwdriver with an adjustable clutch should be used to tighten the screws. Avoid excess overtightening, which might induce undue internal stresses, causing premature failure and buckling of the sheet. Pay attention to insert the screws perpendicular to the material face, as inclined insertion could damage the sheet and/or result in leaks.

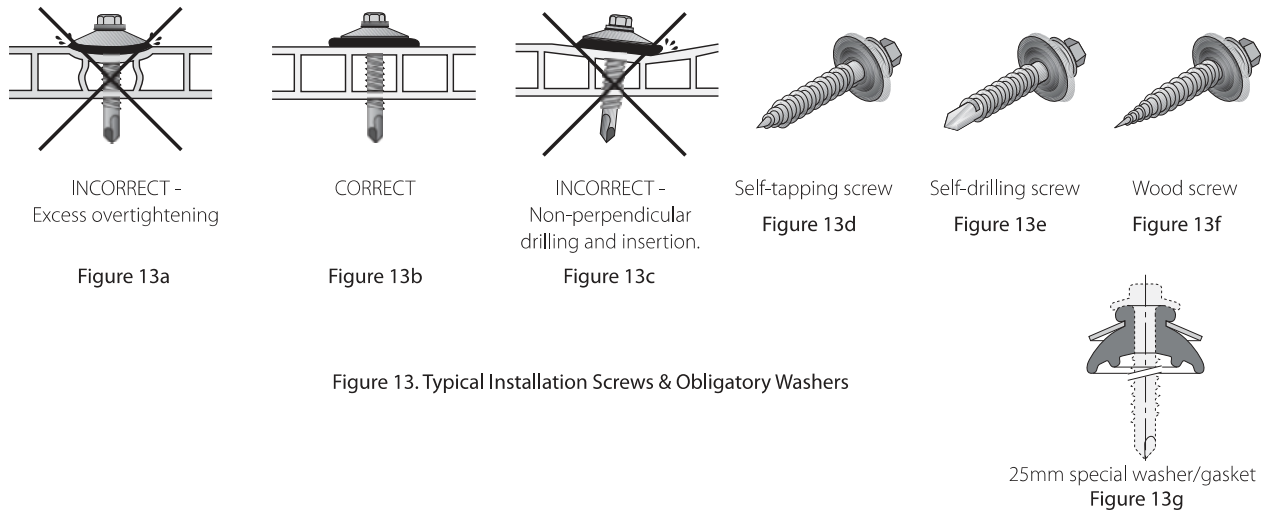


Figure 13. Typical Installation Screws & Obligatory Washers

- 6) 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 heavy-duty hot-dipped galvanized finish, or stainless steel (if used in an extremely corrosive environment). The screws should be 6 mm (1/4 in.) diameter, with length according to sheet thickness, type of washer and type of supporting structure.
- 7) Each screw should be fitted with a conical corrosion resistant steel washer, with specifications as the screws above or of aluminum, at least 1 mm (0.04 in.) thick, 25 mm (1 in.) diameter, with a Specially Shaped integral rubber gasket, EPDM (see PALRAM special washer/gasket fig. 13g). The screw should be tightened carefully, with no distortion of the washer and rubber gasket, or the flat face of the sheet PALRAM will supply the suitable fasteners and washers with the SUNLITE sheets unless required otherwise.

8) **Screw buttons:** Improved performance can be obtained by replacing the washers with special plastic screw buttons, fitted with a suitable rubber gasket, with or without a closing cap. They fit the thickness of each type of sheet (6, 8, 10, 16 mm, and possibly 25 mm), differing by sleeve length. Their advantage: the sleeve prevents excessive tightening and local squashing around the screw, and is softer on the sheet, reducing risk of tear or shear around the screw's stem. They also offer a seal between the fastener hole and the open channels of the sheet, preventing possible infiltration of water and dirt into the internal space of the sheet. Screw buttons work with the same screws mentioned above (6 mm, 1/4 in.), maybe a little longer due to the higher thickness of the button.

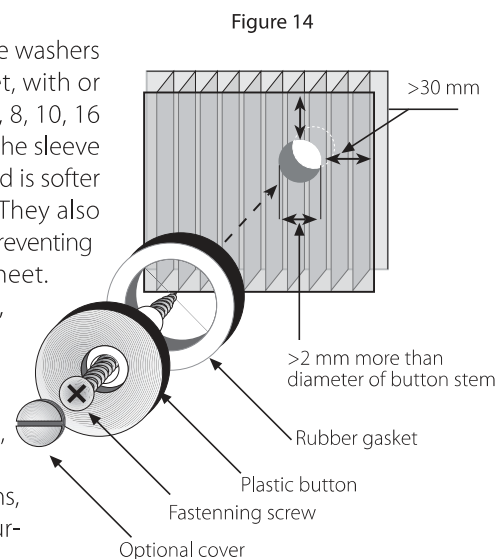


Figure 14

PALRAM recommends perforating SUNLITE for fastening as little as possible, and prefers the use of clamped edge installation. PALRAM recommends that the use of fastening screws in a glazing system, even with plastic buttons, should be limited to economical, price conscious projects only. Two or four-sided clamped glazing is a preferred choice.