

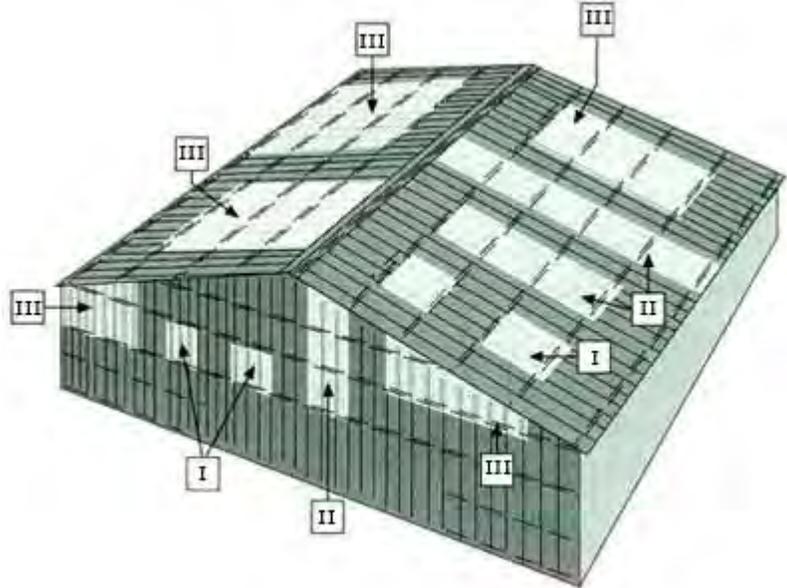
Polycarbonate Skylight

Installation Instructions



Various Skylight Arrangements:

- I - Single Panel, Single Span
- II - Single Panel Run
- III - Multi-Panel Run



A. Transportation, Handling & Storage

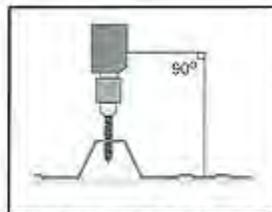
1. Transport and store polycarbonate panels horizontally, on flat, sturdy pallets, equal or longer than the longest panels. Short panels should be stacked on top of longer ones. The panels should be secured and fastened to the pallet during transportation.
2. Store Polycarbonate panels in a cool and shaded place, out of direct sunlight. Avoid covering the stack of panels with dark or heat-absorbing materials or objects, to prevent solar heat buildup.
3. When necessary to store panels outdoors, cover the stack with a white opaque polyethylene sheet, corrugated cardboard or other materials that do not absorb or conduct heat. Verify that the entire stack is covered.
4. Polycarbonate panels are tough, requiring no special care. We recommend though some cautionary steps: **1)** Avoid stepping on or driving over the panel while on the ground, or folding it during handling and installation. **2)** Avoid dragging the panel on the ground, scraping it against the structural elements or any other sharp or rough objects, to prevent it from getting scratched.

B. Chemical Resistance and Fire Hazard Comments

1. Polycarbonate panels are resistant to a variety of chemicals and exhibit limited resistance to a second group of chemicals. A third group of chemicals may attack and damage the panel. Degree & severity of damage depends upon chemical type and duration of exposure. When in doubt, consult with distributor or Suntuf Inc. Technical Support Department.
2. Polycarbonate panels will melt down at approximately 400°F, generating vent openings or smoke release in the event of fire.

C. Sawing, Cutting & Drilling:

1. Polycarbonate panels can be cut or sawed by manual or power tools. A bench/table circular saw is best for straight long cuts. For better results cut a few panels together. Portable circular saws are suitable for on-site straight cuts. A jigsaw is used for cutting limited length or irregular or curved lines. Hand tools such as handsaw, metal shears or hand-held cutting knives can be used for localized, limited work.
2. **Sawing** is done with hardwood saw blades with small teeth, or special blades for plastics, spinning at high speeds, with a slow feed rate. Panels should be clamped at high speeds, with a slow feed rate. Panels should be clamped during sawing, to avoid vibrations. Avoid intersecting cuts. Drill a hole at intersection point, then cut the panel up to the hole.
3. **Drilling** is done using a power drill, with regular high-speed steel bits intended for metal, rotating at about 1,000 RPM. Better results with Polycarbonate are achieved using bits ground to shallower tip angle than for metal. Clamp the drilled panel down to avoid vibrations or movement during operation.
4. Keep the cut area clean. Blow away dust and drilling swarf with compressed air.



DRILLING PANELS

D. Safety Measures (during installation and afterwards):

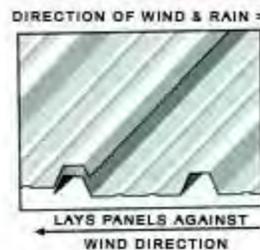
1. Use ladders, crawling boards and other safety equipment required for safe installation. Use all safety measures required according to local safety regulations.

2. Don't step on installed panels between the purlins for fear of falling and other severe bodily harm.
3. Never leave Polycarbonate panels unattended on the roof until all the required fasteners have been appropriately installed or the panels secured to the supporting structure.



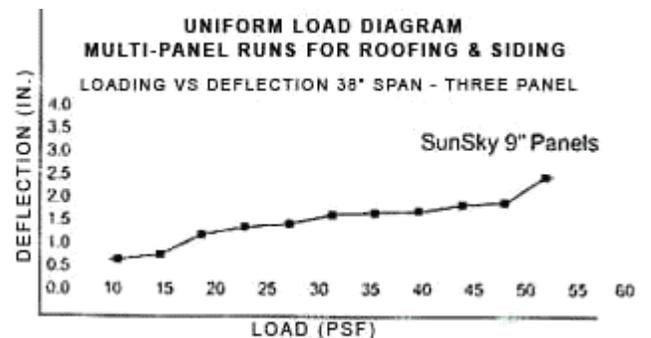
E. Panel Orientation:

1. Polycarbonate's exterior surface is UV resistant, indicated by labeled strips on protected side. Install the panel with the labeled side out. The protected side is up when panel edges are both pointing down.
2. Installation Direction: For multi-panel runs, begin installation of Polycarbonate on the side away from wind and rain direction.



General Indications for Installation

1. **Roof Pitch:** Polycarbonate performs best when installed at pitch rates of 10 percent (1in. to 10 in. slope or 5.7°) or more. When installed at a lower pitch, additional sealing should be applied to insure weather resistance. We recommend Polycarbonate installation about 5% pitch rate.



2. **Load Rating:** The load rating of installed Polycarbonate panels will vary according to the panels' arrangement and span between supporting purlins. Under uniform load, Polycarbonate had no mechanical failures or

cracks at the end of any test to measure ultimate load when tested to "ICBO Evaluation Service Acceptance Criteria, AC 16 Plastic Skylights."

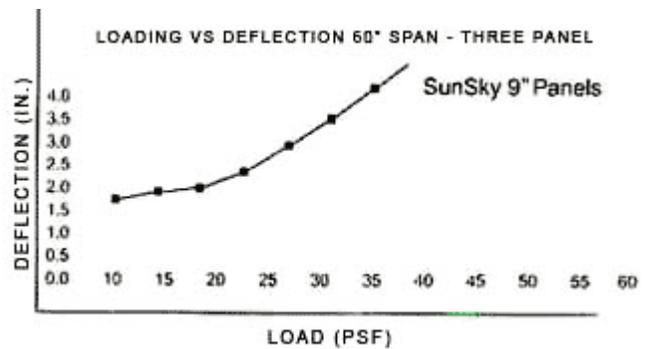
Notes: The diagrams are provided only as guidelines. Information was obtained from tests using Polycarbonate 9" polycarbonate panels as roofing and siding. To avoid premature failure, all proposed spans should be tested in actual tests. In addition, a licensed engineer or architect must verify the application.



3. **Uplift Testing:** Polycarbonate corrugated polycarbonate panels meet Uplift Test Criteria specified in UL 580 Test for Uplift Resistance of Roof Assemblies (UL Class 90).

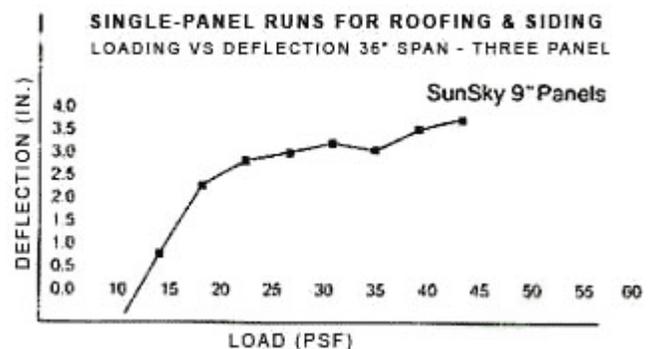
Test Description

- **Roof Covering:** Corrugated polycarbonate roof panels with 9 inch spaced corrugations. The tested material comes in 0.032" thick x 38" width and 12 feet long.
- **Fastener:** 1/4 - 14 x 1-1/2" Type 2 Structural Drilling Fastener, carbon steel, zinc plate with 1" O.D. heavy EPDM/galvanized washer.



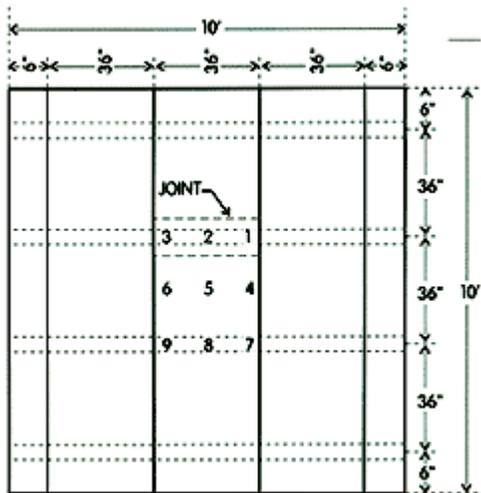
- **Uplift Test Results:** A buckled hip was visible during the test. The fasteners were in place and no cracks or breaks were found in the Polycarbonate panels. The test assembly withstood all phase of test for Class 90. The roof assembly described in this report met the uplift test criteria specified in UL 580-Test for Uplift Resistance of Roof Assemblies. **Note:** The buckled hip returned to the original shape after testing with no panel damage or permanent deformation.

4. **Purlin & Girt Spacing:** Purlin and girt spacing are usually dictated by overall design and engineering calculations along which the whole structure is constructed. Polycarbonate panels are installed at the same purlin/girt spacing as the rest of the metal panels in the structure.



Verify that the installed Polycarbonate panels will remain within the uniform load-supporting limits of deflections as observed by the Evaluation Acceptance tests (see the above "Uniform Load" diagrams and "Uplift" paragraphs.

In case purlin/girt spacing of the metal cladded structure surpass the values depicted in the tables by a significant margin (especially in multi-panel runs), a secondary support system, based on data in the above mentioned tables, should be prepared for the Polycarbonate skylight or sidelight. When designed spacing is marginally larger, on site environmental conditions should be considered and acted upon.



Installation Comments

1. **Single Panel Run Installation:**

The length (long side) outermost crests of a Polycarbonate panel should lap over matching adjacent crests of metal panels on both sides.

2. **Multi-Panel Run Installation:**

The middle Polycarbonate panels should be installed with the regular under/over length overlap (the short crest edge on top of a longer one).

The outermost Polycarbonate panels on both length sides will lap over the adjacent matching metal panels, as in a single panel run, unless designed otherwise.

Attention!

In single panel run (or at both length sides of a multi-panel run), the metal panel/s installed up the slope over the skylight should (if that alternative is chosen) also be length overlapping on both sides, same as the Polycarbonate panel/s down the slope.

3. **Side Lap Support:**

At side-laps of Polycarbonate on Polycarbonate, or metal on Polycarbonate we

recommend installation of length support profiles (closures), made of steel or wood, for better sealing and more rigid cladding installation.

4. Suntuf Inc. strongly recommends the use of Polycarbonate for wall lights.

Fastening & Sealing

1. Use of recommended fasteners and washers, meticulously installed according to our instructions, is essential for full performance values of installed Polycarbonate.
2. **Recommended Fasteners & Washers Positioning for Polycarbonate 9" Panel:**
For standard installation 1/4-14 x 1-1/2" Type 3 drill point self drilling fastener assembled with 25mm Suntuf Inc. special washer/gasket. For severely corrosive environment - same fastener, made of 304 stainless steel. These fasteners should be used for mid-field valley installation and side-lap stitching over metal side panels. For fastening to support profiles and side stitching-to metal panels or other Polycarbonate panels-HWH #14-10 x 1-1/2" Type S drill point self tapping fastener assembled with 25 mm Suntuf special washer/gasket.
3. **Driving Fasteners:**
 - a) Drive fasteners perpendicular (vertical) to the panel's surface and tighten moderately. The fastener head and washer/gasket should sit snugly and fully on the panel's face, without squeezing the gasket and distorting the washer.
 - b) Overtightening will distort the washer, panel and ruin the gasket, causing leakage and panel damage, resulting from the undue internal stresses.
 - c) Tilted fastener insertion will deform the washer, damage the gasket, cause leakage and originate undue stresses on the panel eventually leading to failure
 - d) Tighten fasteners by hand or by an adjustable torque power-screw driver.

Never use impact wrench/driver for fastening Polycarbonate panels.

Sealing Polycarbonate:

1. **Elastomeric butyl-rubber sealing strips**, about 3/32" - 1/8" thick and 1/2" wide should be applied on top of the overlapped areas. Install as follows:
 - Along the center line of the fasteners at the end-lap or near it (with double seals) and on side lap corrugations of the adjoining metal panels (single panel run).
 - The successive Polycarbonate panel side lap (multi-panel runs).
 - The crests and valleys of the successive end/weather lap of the metal or Polycarbonate

panel.

2. Top and Bottom Contoured End Closures:

Top or bottom matching closure strip is used to close the clearance above or below the panel.

- Where Polycarbonate runs reach the top or bottom roof edge, or at the roof ridge, the space between the panel and edge purlin should be closed and sealed with a contoured foam polyethylene (XPE) closure strip, matching the panel profile.
- Where Polycarbonate runs reach the top trim or flat ridge cap, a top closure strip should be used at the top edge above the panel.
- Contoured end-closures may also be made out of wood, when it's worthwhile.

c. - XPE (foamed polyethylene) shaped bottom end-closure

d. - XPE shaped top end-closure

e. - Polycarbonate universal ridge cap

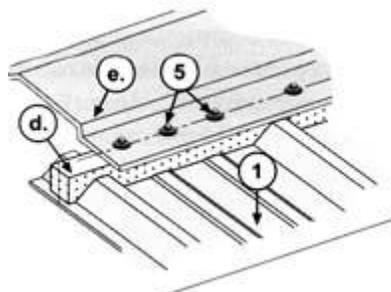
e1. - Sheet-metal universal ridge cap

1. - 9" Polycarbonate Panel

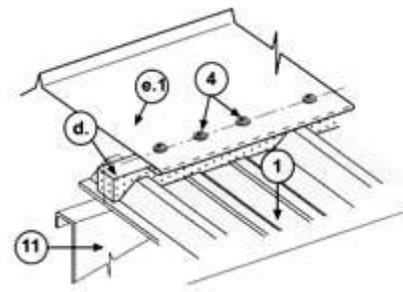
4. - Typical sheet-metal crest or valley fastener with 3/4" conical washer & flat gasket

5. - Polycarbonate crest (side-lap) SDS fastener with Suntuf 3/4" special washer & gasket

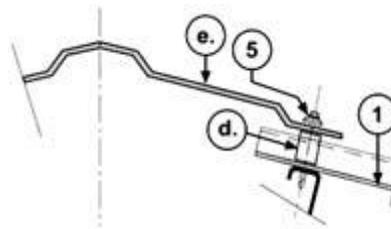
11. - Supporting purlin



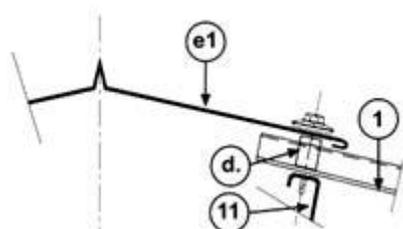
Polycarbonate Ridge Cap Fastening



Sheet-Metal Ridge Cap Fastening



Polycarbonate Ridge Cap Fastening & Top Partial section



Sheet-Metal Ridge Cap Fastening & Top Partial section

Important Installation Notes:

1. **Avoid overtightening of fasteners.** Allow EPDM gaskets to squeeze slightly until full

contact with the panel.

Overtightening induces undue internal stresses, leading to premature failure.

2. **Never use washers with soft PVC (vinyl) gaskets.** Soft PVC is incompatible to polycarbonate and may harm the panel.
3. **Never apply** paints, shading compounds, paint thinners or any material that may chemically attack Polycarbonate, without first verifying compatibility to the panel by contacting Suntuf Inc. or its distributor.
4. **Always work safely.** Follow safety recommendations in the Installation Instructions.
5. **Maximum recommended span:** Net spans should not exceed 5 ft. to avoid thermal expansion buckling. Follow recommendations in the Installation Instructions.
6. **Fastening:** Always use recommended fasteners for securing Polycarbonate panel. Never install Polycarbonate by nailing.
7. **Isolating Polycarbonate from harm:** When placing Polycarbonate on asphalt shingles, soft PVC or vinyl, or other incompatible materials, use an isolating barrier - metal or wooden strips, EPDM rubber patch etc. between the panel and a doubtful material.
8. **Extra Fastening:** On length runs, where Polycarbonate is overlapping metal panels on both sides, we recommend additional side stitching fasteners to the main fasteners connecting the Polycarbonate panel to the purlins. These will be spaced along the overlapping edges about 8-12 in. apart.
9. **End/Weather Lap:** At panels' width overlap-Polycarbonate on metal or another Polycarbonate panel, the end-lap must always to be structurally supported, to avoid deflection at that area. This also applies to ridge cap overlap.
10. **Support Profiles:** At Polycarbonate on Polycarbonate or metal on Polycarbonate side-lap (length overlap), use metal support profiles or wood length closure strips under the side-lap, to minimize deflection. The length wood closure strips should be sized to a specific corrugation - a cross section of 5/8" x 13/16" for Polycarbonate 9".
11. **Silicone Sealants:** Use only recommended silicone sealants appearing in table 2, below or those tested & approved by Suntuf inc.

Product Name / Type	Manufacturer	
Silicone Sealant 3793 Silicone Sealant 705	Dow-Corning	Obscure sealing or bonding materials should be referred to Suntuf inc. or its distributor for evaluation and approval.

Silicone Sealant 791-P Q3-7098-7099		Unapproved sealants, adhesives or bonding materials may be incompatible and may chemically attack the panels, originate failure and revoke any and all warranties.
MultiSil Transparent	GE/Bayer Silicones	

12.

13. **Butyl-Rubber Seals:** Side (length) and End (width) overlap of any type should be sealed with butyl-rubber sealing strip, placed between the overlapping panels at all edges. In roofs with shallow pitch (less than 5 percent) additional adjoining strip is recommended at width overlaps.

Shaped End Closures: Use a profiled foam polyethylene (XPE) sealing strip to seal the space between top or bottom Polycarbonate panel to roof edge purlin or at ridge cap. Matching XPE top & bottom strip are available for each Polycarbonate type. It is held in place by the fasteners holding the panel to the purlin.

14. **Cleaning:** Most normal dirt & dust accumulation is washed off by rain. Regular hosing of the panels with clean lukewarm water is sufficient in dry areas. In polluted, oily environment mild domestic dishwashing detergent may be used when needed, assisted by a soft rag or brush. Never use intense or abrasive cleaning agents or glass window cleaners as they may scratch or chemically attack the panel.

15. **Repair:** Minor damages to the panel may be repaired. A small puncture is stopped by a dab of approved silicone sealant. A larger tear may be patched by a piece of matching panel, bonded & sealed on top of the hole with a compatible structural silicone sealant.

16. **Study and Preparation:** Prior to installation study the Polycarbonate Installation guide carefully, making sure all required materials, accessories and tools are available.