

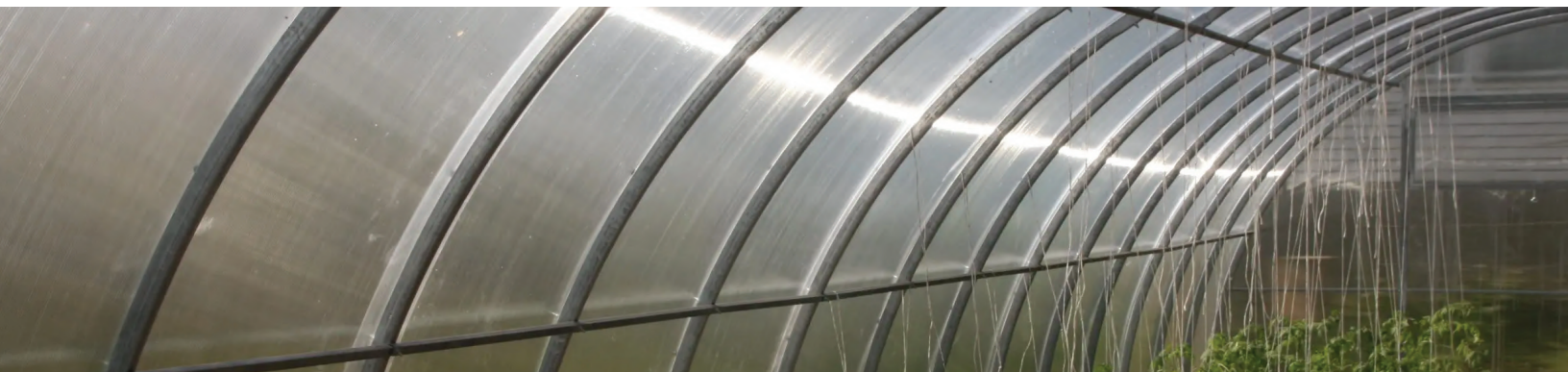


Main Features and Installation Instructions for Polycarbonate Multi-wall Sheets

TECHNICAL MANUAL






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Main Features and Installation Instructions for Polycarbonate Multi-wall Sheets

The Product Specification

Products																													
Walls	2-wall R-structure					3-wall R-structure					4-wall R-structure					4-wall H-structure					5-wall X-structure		7-wall D-structure						
Thickness (mm)	4	4.5	6	8	10	8	10	12	14	16	8	10	12	14	16	18	20	6	8	10	12	14	16	12	16	22	25	32	35
Weight (g/m ²)	850	1000	1300	1500	1700	1700	1900	2100	2400	2700	1900	2100	2200	2400	2800	3000	3300	1300	1700	1900	2200	2400	2700	2100	2800	3600	3800	4000	4200
Max Width (mm)	2100																												
Length	Customized																												
Standard Color	Clear, Opal, Green, Blue, Brown, Gray																												
UV Side	50 µm UV on both sides																												
Anti-drip	Customized																												
LT (max%)	79	78	78	77	75	74	73	71	69	68	72	71	70	69	68	66	63	59	58	57	56	55	53	66	65	58	57	53	50
K-Value (w/m ² -k)	4.1	3.86	3.5	3.4	3.3	2.92	2.68	2.60	2.42	2.27	2.56	2.39	2.30	2.10	2.00	1.88	1.69	2.96	2.58	2.16	1.98	1.74	1.56	2.56	2.10	1.51	1.41	1.32	1.19
Min cold-bending radius (mm)	700	800	1050	1400	1750	1400	1750	2100	2450	2800	1400	1750	2100	2450	2800	3150	3500	1050	1400	1750	2100	2450	2800	2100	2800	4400	5000	6400	7000
Coefficient of Thermal Expansion (mm/mC ²)	0.065																												
Decrease of LT in 10 years (max%)	10																												
Decrease of Yellow index in 10 years (max%)	12																												
Fire Rating	GB - B1																												
Impact Strength																													
Continuous Use Temperature (°C)	-40°C -135°C																												

Points for attention in use

(1) Handling And Storage

- A)** PC multi-wall sheets must be transported and stored horizontally on a flat, sturdy pallet whose dimensions are equal to or larger than those of the sheets. The sheets should be fastened to the pallet. It is possible to store sheets of smaller dimensions on top of sheets that are larger but never store sheets of larger dimensions on top of smaller sheets.
- B)** PC multi-wall sheets are packed with waterproof polyethylene protective films at the factory, and the protective films should be removed before the actual installation; the sheets should be kept in the dry and ventilated place with a top roof, out of direct sunlight and rain.
- C)** Even with protective films, the sheets should avoid long-term in rain, because water will penetrate into the holes inside, and prolonged exposure to sunlight can cause heat to build up, protective films to soften and melt in the surface of the sheets, which will be very difficult to tear.
- D)** Never cover or place on the pallet with materials that are good conductors of heat (e.g. Metal, pipes, clear or dark objects). They will absorb and conduct heat and make damage to the sheets.
- E)** In case 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.

(2) Cutting

- A)** PC multi-wall sheets can be cut by standard wood or metal processing equipment, and the use of specially designed plastic blade plate will mean better results. Ordinary circular saw and handsaw can also be used. It is also possible to use a portable electric saw (machine saws). But be sure to cut them slowly.
- B)** The sheets with thin or medium thickness can be cut with short and sharp blade. A special manual longitudinal cable cutting tool can also be used.
- C)** Note that in any case it is important to support the sheet in the vicinity of the cut to prevent vibration, and to clean away the dust and debris generated by cutting to keep the sheet clean.

(3) Drilling

- A) Drilling should be carried out with drill bit intended for metal. The hole diameter must be 2mm (5 / 64 ") greater than that of the screw or about 150% of the bolt diameter to accommodate the heating or cooling of the sheets. In addition, it should not be perforated within 400mm away from the sheet edge.
- B) Note that all holes must be drilled perpendicular to the surface of the sheet when drilling. (See Picture right)
- C) It is important to support the vicinity where the sheet is being drilled. The dust generated by drilling must be cleaned away before the insertion of the screw.



(4) Sealing and Bonding

- A) PC multi-wall sheets can withstand a variety of corrosive chemicals and for another group of chemicals, their tolerance is limited. There is also a group of chemicals which will damage the sheets. The extent of the damage depends on the severity of erosion and the exposure time. Chloroprene rubber (CR), ethylene propylene diene monomer rubber (EPDM) and neutral silicone etc. are recommended when sealing. If other material is chosen, its chemical compatibility with PC solar panels should be considered. In addition, the thermal expansion and anti-aging properties have to adapt to the solar panels.
- B) Only select adhesive sealant compatible with PC sheet.
- C) The sheets must not be installed to the wet paint or other materials which are not compatible with them; otherwise the PC sheets will be damaged.
- D) The use of the adhesive sealants which are not on the approved list of recommended sealants must get the manufacturer's permission. This license can be obtained through your distributor. The materials which are not in the list, or which have not been approved by the manufacturers may damage the sheets, and make the manufacturer's warranty and the obligation fail.
- E) Silicone sealants are recommended when sealing PC sheets.
- F) It is recommended to seal the TECHPLAST sheets with neatural silicon.

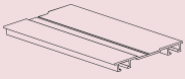
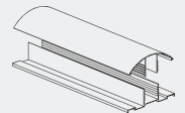
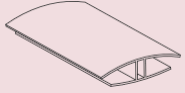
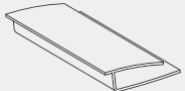
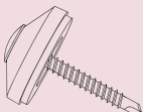

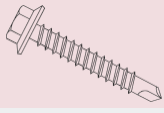
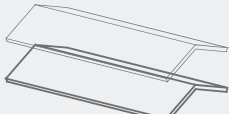
Products	Novasil VP 5128 Novasil S-64	Plastisil BSR 50-20	Silicone Sealant 3793 Silicone Sealant 795 Silicone Sealant 791-P Q3-7098/7099	Multisil Transparent
Manufacturer	Otto Chemie	Simson BV	Dow-Corning	GE/Bayer Silicones

(5) Sexual Chemical Resistance; Accommodating Sealants and Adhesives

PC sheets have very good chemical resistance for many products. Some chemicals may damage the sheets, whose specific information can be found in PC "chemical resistant polycarbonate sheet". If you have any questions about any chemicals, please contact PC or PC dealer.

(6) Accessories

PC has concentrated on providing innovative accessories for PC sheets to achieve a safer, more convenient installation method. Materials now available are PC profile, ETDM waterproof tape, snap profile, compatible sealing and adhesive sealants, H and U-type connection profiles, sealing tape, and according to different requirements of engineering, PC can provide customized profiles and structural parts, such as gutters, roof tiling, U profile and water version.

No.	Accessories	Pictures	Specifications	Sheets recommended
1	Sealing bar		30mm 35mm 38mm 50mm	4mm/6mm 6mm/8mm 8mm/10mm >10mm
2	SNAP profile			4—10mm >12mm sheets with the thickness of the above is not recommended
3	H profile		4mm/6mm 8mm/10mm 16mm	4mm/6mm 8mm/10mm
4	U profile		4mm/6mm 8mm/10mm 16mm	4mm/6mm 8mm/10mm 16mm
5	Plastic washer		40mm	Sheets with any thickness
6	EPDM waterproof tape			
7	Screw			
8	Ridge connector		Flat ridge connector 130° Dimension: 2500x210x210mm Net length 2400mm The above is for standard ridge connector, this kind of product can be customized	Customized

Installation Technical Parameters

(1) Bending Radius

Use of the natural characteristics of polycarbonate plate without heat treatment, it can be cold-formed to the smallest allowed radius, the stress and strain that produced by overtaking the minimum allowable bending radius of the lock plate products will damage sheet and lead it leaving the warranty. In cold-formed sheet metal products, please refer to the product specifications of bending radius parameters in performance, or may be a problem.

(2) Wind load and snow in computing and support the spacing between purlin

A) Taking into account the pressure building and lighting body will be affected by various factors fluctuate, give full consideration to the appropriate pressure coefficient is necessary. Determining the pressure coefficient requires the incorporation of the following factors: the structure and type of construction, the height of the lighting and lighting mentioning shape, flat or vertical side, the roof slope or not, whether the curve of installation.

The total wind load pressure can clearly show the strength of the wind and its destructive power to the building. Detailed wind pressure coefficients can be found from the national building standards.

The following table is a typical wind speed and wind pressure table.

The relationship between wind speed and dynamic pressure.

Wind Speed (m/s)	10	15	20	25	30	35	40	45	50	55	60	65
Static Pressure (N/m ²)	61	138	245	383	552	751	981	1240	1530	1850	2210	2590

The relationship between wind speed and static pressure

Wind	Light	Moderate	Strong	Strong
Speed (km/h)	20	40-60	80-100	120-140
Speed (m/s)	6	11-17	22-28	33-39
Static Pressure (N/m ²)	20	40-62	300-480	680-950

B) Wind load on the roof can be considered equivalent to the uniform vertical load, expressed as per square meter of the horizontal projection of light material load. Because of its excellent thermal insulation properties, goods Cheng roof plate do not let the snow melt immediately, so the snow loads must be considered. Fresh snow each cm height weights:0.8-1.9 kg / m². Snow load factor can be obtained from the local building codes.

C) The distance between the purlins according to the distributed wind and snow loading.

The distance between the purlins according to the loading of the roof surface.

Product	Thickness mm	Wind and Snow loading(kg/m ²)			
		50	80	100	120
Distance between purlins					
2-wall R-structure	4	650	550	450	350
	6	900	800	650	500
	8	1150	1000	850	650
	10	1250	1150	1050	900
3-wall R-structure	8	1120	970	820	620
	10	1220	1125	1020	870
	12	1350	1250	1150	1000
	14	1450	1350	1200	1070
4-wall R-structure	16	1600	1450	1250	1130
	8	1120	970	820	620
	10	1220	1125	1020	870
	12	1350	1250	1150	1000
4-wall H-structure	14	1450	1350	1200	1070
	16	1600	1450	1250	1130
	18	1720	1550	1300	1190
	20	1850	1650	1350	1250
5-wall X-structure	6	900	800	650	500
	8	1120	970	820	620
	10	1220	1125	1020	870
	12	1350	1250	1150	1000
7-wall D-structure	14	1450	1350	1200	1070
	16	1600	1450	1250	1130
	16	1600	1450	1250	1130
7-wall D-structure	22	2100	1850	1570	1300
	25	2100	1850	1570	1300
	32	2100	1950	1670	1400
	35	2100	1950	1670	1400

Notes: specific gravity: 4-wall R-structure 8mm=3-wall R-structure10mm, 4-wall R-structure10mm = 3-wall R-structure12mm
4-wall H-structure 8mm = 2-wall R-structure 10mm, 4-wall H-structure10mm=2-wall R-structure12mm

Note:

- a) Distance calculations are based on general knowledge, previous experience and professional techniques directing to this kind of products .
- b) Standard weight is based on continuous support spacing shown in the middle edge of the pitch estimate of 5% deflection and inference, edge, the distance between the upper and lower corresponding to 20%;
- c) PC sheets can withstand greater sincerity or edge of the pitch magnification load without damage, but the deflection will be increased to 10% of pitch, usually the deflection can not be accepted.

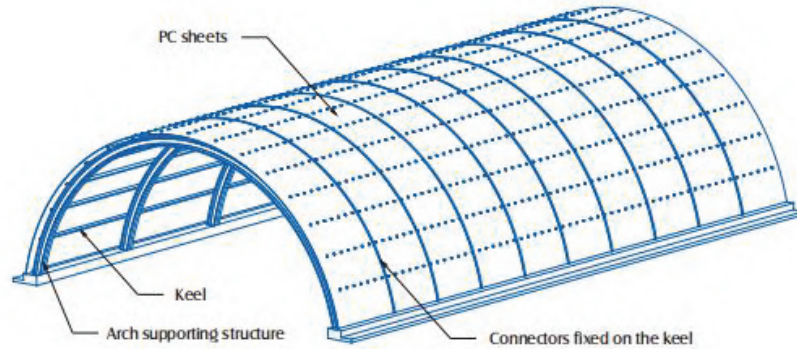
To design the distance of the purlins according to the load of the roof.

Products	Thickness mm	Bending radius kg/m ²	Wind and snow loading (kg/m ²)			
			80	50	100	120
			Distance between purlins			
2-wall R-structure	6	1050	1730	1730	1730	1730
		1500	1570	1570	1200	1200
		1800	1420	1420	1150	1150
		2200	1380	1380	1150	1150
		2800	1260	1260	1100	1100
		4000	1150	900	850	780
	8	6000	900	800	650	500
		1400	1570	1570	1570	1570
		1800	1880	1420	1420	1420
		2200	1730	1380	1380	1380
		2800	1470	1470	1250	1100
		4000	1250	1150	1050	900
	10	6000	1150	1000	850	650
		1750	1885	1885	1885	1885
		2200	1750	1750	1750	1725
		2800	1725	1725	1725	1450
		4000	1570	1400	1250	1250
		6000	1260	1200	1100	925
3-wall R-structure	8	1400	1780	1780	1780	1780
		1800	1600	1570	1460	1540
		2200	1480	1420	1300	1310
		2800	1360	1270	1140	1080
		4000	1240	1120	980	850
		6000	1120	970	820	620
	10	1750	1820	1625	1540	1470
		2200	1670	1500	1410	1320
		2800	1520	1375	1280	1170
		4000	1370	1250	1150	1020
		6000	1220	1125	1020	870
		2100	1800	1700	1540	1360
	12	2800	1650	1550	1410	1240
		4000	1500	1400	1280	1120
		6000	1350	1250	1150	1000
		2450	1900	1800	1740	1610
		2800	1750	1650	1560	1430
		4000	1600	1500	1380	1250
14	6000	1450	1350	1200	1070	
	2800	1900	1790	1550	1430	
	4000	1750	1620	1400	1280	
	6000	1600	1450	1250	1130	
	1400	1780	1780	1780	1780	
	1800	1600	1570	1460	1540	
4-wall R-structure	8	2200	1480	1420	1300	1310
		4000	1240	1120	980	850
		6000	1120	970	820	620
		1750	1820	1625	1540	1470
		2200	1670	1500	1410	1320
		2800	1520	1375	1280	1170
	10	4000	1370	1250	1150	1020
		6000	1220	1125	1020	870
		2100	1800	1700	1540	1360
		2800	1650	1550	1410	1240
		4000	1500	1400	1280	1120
		6000	1350	1250	1150	1000
	12	2450	1900	1800	1740	1610
		2800	1750	1650	1560	1430
		4000	1600	1500	1380	1250
		6000	1450	1350	1200	1070
		2800	1900	1790	1550	1430
		4000	1750	1620	1400	1280

Products	Thickness	Bending radius	Wind and snow loading (kg/m ²)			
			80	50	100	120
	mm	kg/m ²	Distance between purlins			
4-wall R-structure	14	2450	1900	1800	1740	1610
		2800	1750	1650	1560	1430
		4000	1600	1500	1380	1250
	16	6000	1450	1350	1200	1070
		2800	1900	1790	1550	1430
		4000	1750	1620	1400	1280
	18	6000	1600	1450	1250	1130
		3150	2100	1850	1800	1400
		4000	1920	1720	1550	1300
	20	6000	1720	1550	1300	1190
		3500	2300	2050	1950	1450
		4000	2100	1850	1650	1350
4-wall H-structure	6	6000	1850	1650	1350	1250
		1050	1730	1730	1730	1730
		1500	1570	1570	1200	1200
		1800	1420	1420	1150	1150
		2200	1380	1380	1150	1150
		2800	1260	1260	1100	1100
	8	4000	1150	900	850	780
		6000	900	800	650	500
		1400	1870	1720	1570	1620
		1800	1720	1570	1420	1420
		2200	1570	1420	1270	1220
		2800	1420	1270	1120	1020
10	4000	1270	1120	970	820	
	6000	1120	970	820	620	
	1750	1860	1505	1440	1470	
	2200	1700	1410	1335	1320	
	2800	1540	1315	1230	1170	
	4000	1380	1220	1125	1020	
12	6000	1220	1125	1020	870	
	2100	1800	1550	1450	1450	
	2800	1650	1450	1350	1300	
	4000	1500	1350	1250	1150	
	6000	1350	1250	1150	1000	
	2450	1900	1650	1650	1460	
14	2800	1750	1550	1500	1330	
	4000	1600	1450	1350	1200	
	6000	1450	1350	1200	1070	
	2800	1900	1750	1650	1370	
	4000	1750	1600	1450	1250	
	6000	1600	1450	1250	1130	
16	2100	1800	1700	1600	1450	
	2800	1650	1550	1450	1300	
	4000	1500	1400	1300	1150	
	6000	1350	1250	1150	1000	
	2800	1900	1750	1650	1370	
	4000	1750	1600	1450	1250	
5-wall X-structure	12	6000	1600	1450	1250	1130
		4400	2300	2050	1770	1500
		6000	2100	1850	1570	1300
	16	5000	2300	2050	1770	1500
		6000	2100	1850	1570	1300
		6400	2200	2050	1770	1500
7-wall D-structure	25	8000	2100	1950	1670	1400
		7000	2200	2050	1770	1500
	35	8200	2100	1950	1670	1400

Note:

- a) The space distance is based on the space distance of the continuously supported beams in the middle, 5% of the deflection and the load. What's more, the space distance of the edge, the upper and under part should be less than 15--20%.
- b) The stiffness of the curving steel sheets is better, so the brace space can be enlarged, especially in the case that the bend radius is relatively small; the stiffness for the steel sheets decrease as the bend radius increase, the stiffness for the slightly curved steel sheets is almost the same with the flat sheets.



D) The general matters needing attention for the structure design:

- a) As the load / spacing shows that, the recommended support space distance can not replace the requirements of the local structures and construction standards, the final distance is determined by the actual conditions for the construction site and the engineering designs.
- b) The space distance between the last continuous beams should be at most the 80% of the distance of the middle span, for the special cases are designed by the designers.

(3) Calculation of the thermal expansion allowance space

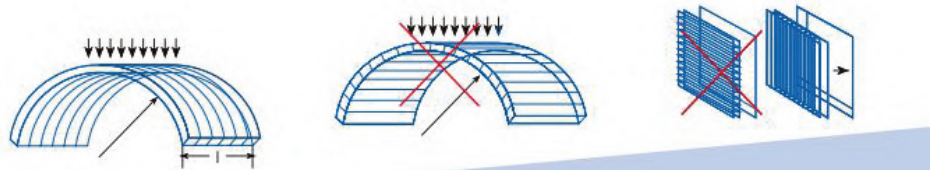
A) The using temperature for TECHPLAST steel sheets in most practical cases is in the range of 50 °C, the thermal expansion and contraction for each meter is about 3mm, such as the sheet of which the width is 1m, the length is 1.5m, so the thermal expansion in the width is 3mm, in the length is 5mm. Of course, we can also use the coefficient of expansion of the control panel / cm / °C to accurately calculate the thermal expansion and contraction of the hollow sheets.

B) Obligate Expansion Space, the size of the Expansion Space can be calculated by the bellowing formula:
 The value of Expansion= linear Expansion modulus×length×the maximum temperature changing value
 The linear Expansion modulus is settled= 7×10^{-5} (cm/cm/°C)
 For example: PC sheet whose length is 100cm, now we install it in the environment whose range of temperature is 40°C, then the space reserved for expansion is:
 Expansion value = 7×10^{-5} (cm / cm / °C) × 100 (cm) × 40 °C = 0.28 (cm) so the reserved expansion space is at least 0.28cm.

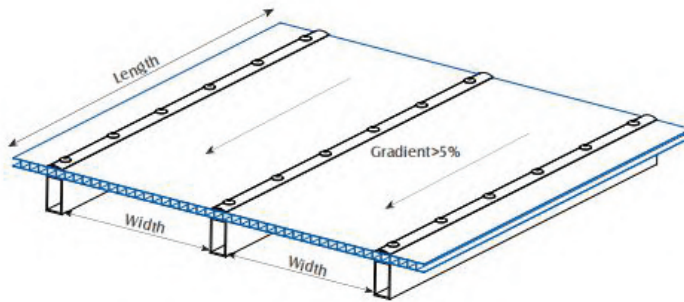
C) The depth of the slot = reserved expansion space + embedding dimension for the edge, TECHPLAST propose that the slot depth for the sheets whose width is less than 1.0m width is at least 20mm, the slot depth for the sheets whose width is more than 1.0m is 25-30mm.

(4) Setting and Layout

A) The installation of TECHPLAST steel sheets should make the holes of the sheets face the downside, so we can reduce the accumulation of dust inside, and the condensate can be easily exported.



- B)** We should use the materials which are easily to get the light to connect the edge of the adjacent sheets for installation.
- C)** In the circumstance of level or flat surface installation (such as in the roof, skylights etc.) the falling gradient must be at least 5%, the falling gradient that equal to or larger than 10% is better. The larger the falling gradient is, the better the drainage and self-cleaning systems are. We should reduce the risk that water and dust penetrate in the connectors and fasteners, at the same time, it's good for us to reduce the visual curvature deviation which is cause by load bending.

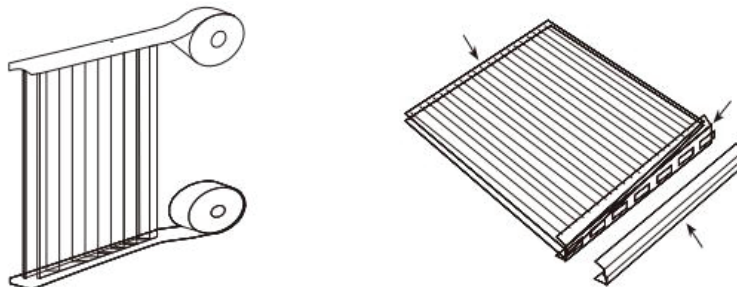


- D)** The direction of the length and rib should be in the same direction, and the direction of the width and the rib should be vertical.

Installation Instructions

(1) Preparation Before Installation

- A)** As a rule, we recommend to install the TECHPLAST sheets under relatively high temperature, so we can minimize the thermal expansion. In summer, we recommend that, when we install two sheets, we should reserve 5mm space distance between the two plates, and when in winter, we should reserve 8mm.
- B)** We should make the strip in the open end of the sheets and the protective film 75-100mm (3-4in) from the end of the sheet, so we can stick the foil weatherstrip. We should stick the weatherstrip along the open end, so we can well-proportioned and firmly attached it to the two sides of the sheets, what's more, we should make sure that all the open ends of the fin grooves are properly sealed.
- C)** Both sides of the sheets have protective film. In order to maintain surface of the sheets clean, we should not damage the film before installation. We should remove the bottom film before actually install the sheets to the roof. Remove the protective film too early may lead to damage the sheets during the installation.
- D)** During the process of installation, we can tear the edge of the protective film to about 5cm according to the needs, After the installation being complete, we can tear up the protective film; after the lighting area is installed, we should immediately remove the outer protective film, or remove it in the shortest time. If we don't do this, the protective film will be exposed to the sunlight directly. As the degradation of the film itself, it's very difficult to remove it then, and the warranty will be invalidated. Before the u-shaped protective plug is installed above the ventilation filter and under the plate, it is necessary to drill a number of 6mm (1/4") won the sink hole, holes between the separated 200mm (8"), for water supply and drainage



(2) Installation Method

A) Common installation method (with longitudinal design of purlins)

In addition to horizontal purlins design, the design of supporting the connection between two sheets with a longitudinal purlin has a better support, which is able to withstand greater wind, snow load factor and it is widely used. Another advantage of this design is that it only need a few accessories: silicone, waterproof tape, profile, and plastic washer can be installed to achieve the desired effect.

- a) Along the longitudinal continuous span purlin, two pieces of sheets should keep a distance of 5-8 mm (5mm in summer and 8mm in winter).
- b) In the spacing between two sheets fill with neutral silicon, neutral silicon not only have the function of waterproof connection plate, but also left a compressible sheet of thermal expansion and contraction of space. (There are many) silicone is not appropriate to install a polycarbonate sheet, please refer to the specific sealing and bonding).
- c) Sealing again with waterproof adhesive tape where have been filled with neutral silicon.
- d) Cover the waterproof adhesive tape with a matching profile, fixing them with screws and the distance between the screws should be 500mm. For the edge the edge screw spacing should be adjusted to the surface, inclined plate may lead to damage or leakage of the sheets.
- e) It should use the drill-limited device to fasten screws, to avoid excessive tightening caused by stress. The early failure of internal stresses can cause sheet and warping. Each screw should be equipped with rubber mat, plastic washer. Tighten the screws carefully and avoid to make the gasket, rubber sheet and the surface of the PC sheet distorted. Large cap to prevent over-drilling and fracturing under the screws around the board, so even pressed, to avoid cracking opening; while sealing plate hole to prevent water and dust penetration into the inner plate.
- f) It is suggested that to fix the screws with plastic washers, rather than directly fix the sheets with screws, because fixing with screws directly must be pre-drilled to meet the thermal expansion and contraction of the sheets which will bring up the risk of leakage of water. The plastic washer can perfectly meet the thermal expansion and contraction of the sheets and avoid the risk of leakage of water.

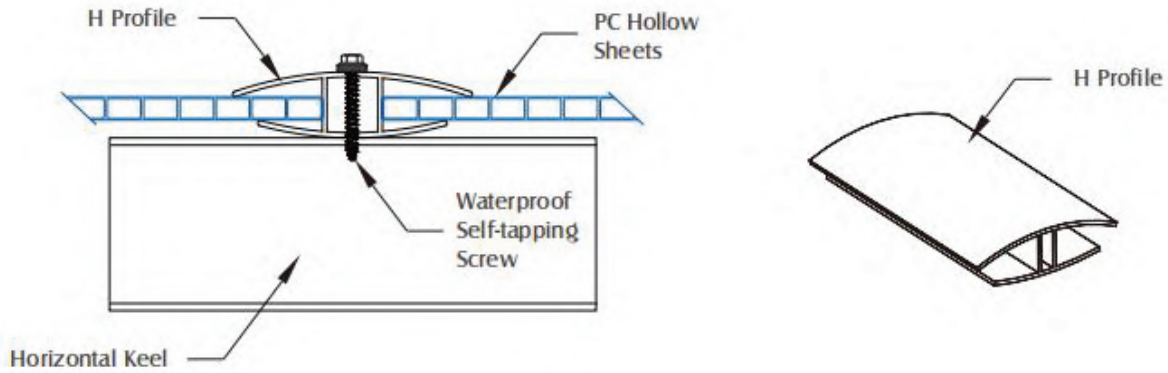
B) The simple installation method (longitudinal purlins)

There are connectors with different types to match almost all sheets with different thickness, or one type for sheets with thickness of 4-6mm, one for 8--10mm, and one for 12--16mm. For a thicker sheet metal, does not recommend the use of such material. Connectors (alumina, and iron, rigid PVC or polycarbonate) omission of bearing capacity considering only connection, through which you can form a watertight barrier of external as well as moderate increase in overall stiffness.

Here are two common connector installation methods:

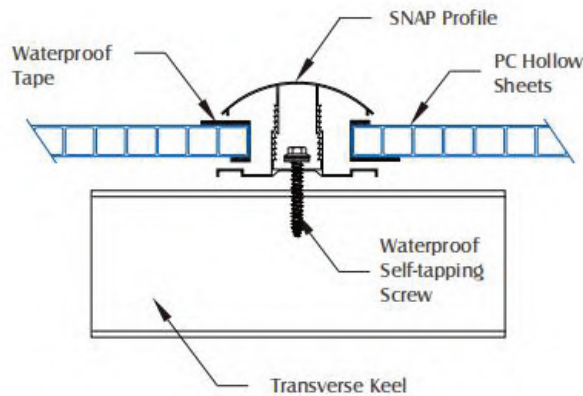
H-shaped connecting plate (PC, aluminum or other material compatible with polycarbonate)

- a) The edge of the map sheet sides marked with neutral neutral silicon into the profile system, side wings set aside to allow thermal expansion and contraction of the plate displacement.
- b) Along the horizontal purlin spacing to 300-400mm plate with screws.
- c) Seal H-connection profiles on both sides with neatural Silicon.



SNAP profile (PC, aluminum materials or other materials compatible with polycarbonate)

- a) SNAP profile is installed to the purlin vertically, usually the one that is better in stiffness in the two parts. Plate will be put on it and is fixed to purlin by screw.
- b) The two sides of the plates is put on the buckle up and down profiles after pasted with water-proof tape. Two side wings allow the displacement of heating or cooling plate.
- c) SNAP profile, usually more flexible than the buckle down profile and can be set into the buckle down profiles with hand. Mechanical pressure thus produced can be used to fix the solid edge of plate.
- d) Like the linking method of mode H, we use silicone to seal the two sides of the up and down buckle.



B) The calculation of distance and load of different installation method.

a) Fixing and supporting of four sides

This method, by using plates that are cutting into pieces as lighting units, can put the PC plates in a frame with four sides or supporting structure and fix the four sides. Plastics, wood or metal materials can be used to fix, as well as using rubber seal, nail, screw and bolt.

- 1) The supporting capacity and coil degree of this lighting system is affected by the length and width rate of the plate. The centre distance of the supporting can be used as length and width parameter. Usually, when the rate of length and width is 1to 1, plate of the same sickness will have the highest supporting capacity. When is 1to 1 between 1to 1.5, four-side fixing system still has supporting advantages, and when higher than this rate, its supporting capacity of this system will become the same as the system of the two-side fixing system.

- 2) The supporting capacity and coil degree of this lighting system is affected by the length and width rate of the plate. The centre distance of the supporting can be used as length and width parameter. Usually, when the rate of length and width is 1to 1, plate of the same sickness will have the highest supporting capacity. When is 1to 1 between 1to 1.5, four-side fixing system still has supporting advantages, and when higher than this rate, its supporting capacity of this system will become the same as the system of the two-side fixing system.
- 3) Quadrilateral fixed or supported method is widely used in vertical installation (e.g. side windows and light boxes).There exists much difficulty in drainage and condensate dredging for horizontal and obliquely installation. In this case, two-side fixed method is the best choice.

In the quadrilateral fixed system, the maximum recommended values of the center-to-center spacing of the shorter side (also width) vary from the aspect ratio and diverse loads.

Product	Thickness	Wind and snow loading	Center Distance of the short side according to different length breadth ratio		
			Ratio 1:1	Ratio 1.5:1	Ratio > 1.5:1
2-wall R-structure	4	50	600	500	400
		80	500	400	350
		100	400	350	-
		120	350	300	-
	6	50	900	700	500
		80	700	500	350
		100	500	400	-
		120	400	300	-
	8	50	1150	900	600
		80	1000	800	480
		100	900	550	450
		120	750	500	-
10	50	1250	1000	750	
	80	1200	750	550	
	100	1100	600	500	
	120	950	520	450	
3-wall R-structure	8	50	1200	950	650
		80	1050	720	510
		100	950	560	470
		120	800	510	-
	10	50	1275	1050	800
		80	1225	800	600
		100	1125	650	550
		120	975	550	480
12	50	1350	1125	875	
	80	1300	875	675	
	100	1200	725	625	
	120	1050	625	555	
14	50	1425	1200	950	
	80	1375	950	750	
	100	1275	800	700	
	120	1125	700	630	
16	50	1500	1200	1100	
	80	1300	1100	1000	
	100	1200	1050	900	
	120	1100	950	850	
4-wall R-structure	8	50	1200	950	650
		80	1050	720	510
		100	950	560	470
		120	800	510	-
	10	50	1275	1050	800
		80	1225	800	600
		100	1125	650	550
		120	975	550	480
	12	50	1350	1125	875
		80	1300	875	675
		100	1200	725	625
		120	1050	625	555
14	50	1425	1200	950	
	80	1375	950	750	
	100	1275	800	700	
	120	1125	700	630	
16	50	1500	1200	1100	
	80	1300	1100	1000	
	100	1200	1050	900	
	120	1100	950	850	
4-wall H-structure	6	50	1200	950	650
		80	1050	720	510
		100	950	560	470
		120	800	510	-
	8	50	1275	1050	800
		80	1225	800	600
		100	1125	650	550
		120	975	550	480
	10	50	1350	1125	875
		80	1300	875	675
		100	1200	725	625
		120	1050	625	555
12	50	1425	1200	950	
	80	1375	950	750	
	100	1275	800	700	
	120	1125	700	630	
14	50	1500	1200	1100	
	80	1300	1100	1000	
	100	1200	1050	900	
	120	1100	950	850	
4-wall D-structure	18	50	1575	1275	1175
		80	1375	1175	1075
		100	1275	1125	975
		120	1175	1025	925
	20	50	1650	1350	1250
		80	1450	1250	1150
		100	1350	1200	1050
		120	1250	1100	1000
	22	50	1725	1425	1325
		80	1525	1325	1225
		100	1425	1225	1125
		120	1325	1125	1025
25	50	1800	1500	1400	
	80	1600	1400	1300	
	100	1500	1300	1200	
	120	1400	1200	1100	
28	50	1950	1600	1450	
	80	1750	1500	1350	
	100	1650	1400	1250	
	120	1550	1300	1150	
32	50	2100	1700	1500	
	80	1900	1600	1400	
	100	1800	1500	1300	
	120	1700	1400	1200	
35	50	2100	1700	1500	
	80	1900	1600	1400	
	100	1800	1500	1300	
	120	1700	1400	1200	

b) Two-side Fixed Installation

It is a simple installation system, in which the middle of the sheet isn't necessarily fixed, and there are certain sections of the two sides along the length. However, the bearing capacity of it is not that tough. Sheets that meet the load requirements are limited in width.

The maximum recommended values of the center-to-center spacing of the TECHPLASTPC sheet materials that apply the two-side fixed planar lighting system are as follows:

Product	Thickness mm	Distributed loading (kg/m ²)			
		50	80	100	120
2-wall R-structure	6	450	320	-	-
	8	540	430	400	-
	10	680	500	450	400
3-wall R-structure	8	575	450	400	-
	10	700	525	475	425
	12	850	700	625	525
	14	925	800	725	625
4-wall R-structure	16	990	900	800	700
	8	575	450	400	-
	10	700	525	475	425
	12	850	700	625	525
	14	925	800	725	625
4-wall H-structure	16	990	900	800	700
	18	1025	1000	925	900
	20	1130	1100	1070	1040
	6	575	450	400	-
5-wall X-structure	8	700	525	475	425
	10	850	700	625	525
	12	925	800	725	625
	14	990	900	800	700
7-wall D-structure	16	1025	1000	925	900
	12	900	750	700	600
	16	1050	950	850	750
7-wall D-structure	22	1200	1100	1050	1000
	25	1400	1200	1150	1100
	32	1900	1400	1200	1150
	35	1525	1425	1225	1175

a) Under desired cold bending circumstances, the TECHPLAST PC sheet materials can be bent arched without affecting their mechanical properties. Besides, the internal stress generated by bending enables the sheets to obtain better strength and stiffness in both directions.

b) The figure below shows the increase of stiffness of the sheet materials with different uniform load.

The maximum recommended values of the center-to-center spacing of the arched purline curved radius in the two-side fixed system are as follows:

Product	Thickness	Bending radius	Distance between purlins according to different distributed loading				Product	Thickness	Bending radius	Distance between purlins according to different distributed loading				
			Distributed wind and snow loading (kg/m ²)							Distributed wind and snow loading (kg/m ²)				
			50	80	100	120				50	80	100	120	
	mm	mm						mm	mm					
			50	80	100	120				50	80	100	120	
2-wall R-structure	6	1050	2000	1730	1420	1020	4-wall R-structure	14	2800	1650	1300	1100	930	
		1500	1470	1090	890	660			4000	1150	800	600	430	
		1800	1140	860	690	580			6000	950	600	400	230	
		2200	810	690	-	-			2800	1850	1650	1450	1200	
		2800	500	350	-	-			4000	1450	1220	940	850	
		4000	500	350	-	-			6000	1050	1000	850	800	
	8	1400	1650	1450	1320	1170		18	3150	2050	1750	1500	1250	
		1800	1420	1270	1070	890			4000	1650	1450	1280	1110	
		2200	1090	890	710	600			6000	1250	1150	1050	950	
		2800	840	620	450	-			20	3500	2000	1700	1450	1200
		4000	600	500	-	-				4000	1600	1400	1200	1000
		10	6000	570	480	-			-	6000	1200	1100	950	800
1750	1630		1420	1170	1020	4-wall H-structure	6	1500	1320	1170	980	750		
2200	1320		960	810	660			1800	1035	780	580	520		
2800	890		650	600	550			2200	750	570	400	350		
4000	750		550	500	450			2800	500	450	350	300		
6000	700		520	500	420			4000	480	400	300	-		
6000	450	350	-	-	6000			450	350	-	-			
8	1760	1320	1170	980	750		8	1800	1220	880	720	580		
	2200	1025	780	580	520			2200	780	580	500	450		
	2800	750	570	400	-			2800	520	500	450	400		
	4000	500	450	-	-			4000	550	450	425	350		
	6000	480	400	-	-			6000	525	500	400	-		
	2200	1220	880	720	580			10	2200	1450	1100	900	730	
2800	780	580	500	450	2800	720	780		650	480				
4000	520	500	450	400	4000	750	670		620	450				
6000	550	450	400	-	6000	725	650		600	425				
2800	1450	1100	900	730	12	2800	1650		1300	1100	930			
4000	980	780	650	480		4000	1150		800	600	430			
6000	720	670	620	450		6000	950	600	400	230				
2800	1650	1300	1100	930		14	2800	1850	1650	1450	1200			
4000	1150	800	600	430			4000	1450	1220	940	850			
6000	950	600	400	230		16	6000	1050	1000	850	800			
2800	1850	1650	1450	1200	5-wall X-structure		12	3000	1750	1600	1500	1400		
4000	1450	1220	940	850				2800	1650	1200	1100	1000		
6000	1050	1000	850	800	7-wall D-structure		22	4400	1725	1575	1475	1450		
1800	1320	1170	980	750				6000	1675	1500	1450	1400		
2200	1025	780	580	520				25	5000	1650	1450	1400	1350	
2800	750	570	400	-		6000			1550	1350	1400	1250		
4000	500	450	-	-	32	6400	1550	1350	1350	1300				
6000	480	400	-	-		35	8000	1650	1550	1250	1200			
10	10	2200	1220	880	720		580	7000	1650	1550	1350	1300		
		2800	780	580	500	450	8200	1550	1450	1250	1200			
		4000	520	500	450	400								
	12	2800	1450	1100	900	730								
		4000	980	780	650	480								
		6000	720	670	620	450								

* Notice:

The sign"—"shown in the figure implies that the materials within the scope cannot be utilized; and it usually makes no sense if the purline spacing is less than 600mm; the minimal radius (the first line of each item) is the sheet's minimal permissible cold bending radius.

General Guidelines

(1) Clean

- A)** Generally speaking, rain itself is enough for cleaning. With the dilute neutral detergents(e.g. ethanol, ethane and butylcellulose),or household washing agents, people may use the sponge or mull to scrub the sheets, flush them with clean water to clean partial small areas. Make sure that the washing agents are free from abradant or solvent.
- B)** Severe oil marks can be removed by isopropanol water solution. Alkaline substances or detergents which are incompatible with polycarbonate, e.g. benzene, gasoline, acetone, carbon tetrachloride, cannot be used to clean sheets.
- C)** Avoid dry cleaning, for the adhering dust particles may scratch the surface and damage the sheets.
- D)** As for large areas, people can wash them with high-pressure water jets and add soft compatible solvent; also, people can flush them with steam spray gun.

(2) Safety Measures

- A)** During the installation or maintenance, the stairs or creeper tread supported by roof construction units should be employed.
- B)** Remember not to stamp the purline of the sheets. People are only allowed to walk on it in case of emergency.
- C)** Upon construction, the sundries on the sheets should be swept away.