PALRAM

CONSTRUCTION ARCHITECTURE

SUNGLAZE™

Solid Polycarbonate Standing Seam Architectural System

Build On.

SUNGLAZE™ Solid Polycarbonate Standing Seam Architectural System

Content

Introduction	2
Main Benefits	2
Applications	2
Panel Types	3
Colors	3
SUNGLAZE™ Projects	4
Thermal Insulation	6
Flammability	6
Typical Physical Properties	7
Acoustic Properties	7
Resistance to UV Radiation	8
Chemical Characteristics	8
System Principles	8
System Components	9
Installation Data	10
Assembly Details	11
Installation Guidelines	12
Manufacturer's Lifetime Warranty	14

Introduction

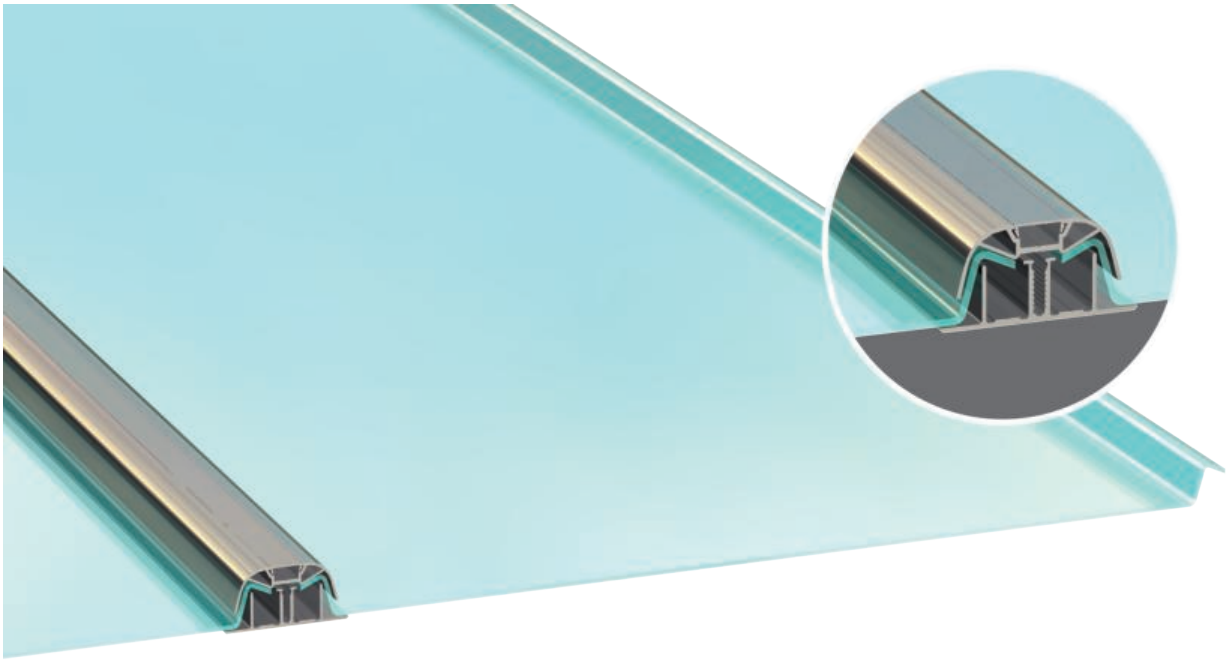
Sunglaze is an architectural system that offers smart design, elegant appearance, versatility, low maintenance and sustainable performance to various architectural challenges. Sunglaze incorporates proprietary standing-seam profiling and glazing that enable wide spans and high loading capacity. It can be specified in various lengths to match different structures, including flat and curved designs. Sunglaze is easy to fasten, the panels are simply joined by an aluminum profile set that is enclosed at the ends by end-closures. Screws lock the system and fix it to the structure without any penetration through the panels. The Cap-plug completes the assembly, covering the screw head and provides a smooth appearance from above.

Main Benefits

- ✓ Clear and elegant appearance
- ✓ Standing seam leak-proof performance
- ✓ Free thermal expansion
- ✓ Caulking and silicone free
- ✓ Withstanding high loads
- ✓ Easy, fast and safe installation
- ✓ Minimal maintenance

Applications

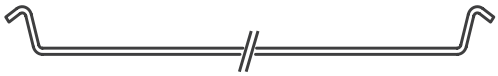
- Architectural projects
- Commercial and retail
- Sports venues roofing
- Covered walkways
- Open markets
- Service stations
- Entrances
- Pool covers



Scan for product video overview

Panel Types

Sunglaze solid polycarbonate panels are offered in 3mm, 4mm and 6mm thickness. Panel width is determined by the system width, 600mm or 800mm. Maximum panel length is 11.9m (Typical stock length, equaling slightly more than 39 feet). Standard Sunglaze panels include UV protection on one side (UV protection on both sides is optional for special orders).



	SUNGLAZE™ 3/600	SUNGLAZE™ 4/600	SUNGLAZE™ 4/800	SUNGLAZE™ 6/800
Width	584mm (600mm system)	585mm (600mm system)	785mm (800mm system)	785mm (800mm system)
Height	20mm	21mm	21mm	21mm
Weight	3.79 Kg/m^2 (2.20 Kg/m)	5.05 Kg/m^2 (2.94 Kg/m)	4.98 Kg/m^2 (3.90 Kg/m)	7.453 Kg/m^2 (5.96 Kg/m)
Min. cold bending radius*	4m (For the polycarbonate panel)	4m (For the polycarbonate panel)	4m (For the polycarbonate panel)	4m (For the polycarbonate panel)
System weight	6.14 Kg/m^2	7.40 Kg/m^2	6.73 Kg/m^2	9.25 Kg/m^2

* Sunglaze aluminum profiles must be roll formed separately to the desired radius, not below a minimum radius of 4m.

Colors

Color	% Light Transmission ASTM D-1003	%Haze ASTM D-1003	Solar Heat Gain (SHGC) ASTM E-424-71	Shading Coefficient ASTM E-424-71
Clear	90	<1	0.87	1.00
Bronze	20	<1	0.45	0.52
	35	<1	0.56	0.64
	50	<1	0.65	075
Grey	20	<1	0.44	0.51
	35	<1	0.56	0.64
	50	<1	0.65	0.75
White Opal	28	100	0.32	0.37
White Diffuser	80	100	0.87	1.00
Solar Ice	20	100	0.39	0.45
Solar Control	20	67	0.33	0.36
Solar Olympic	20	50	0.41	0.47
	35	35	0.52	0.60
	50	20	0.63	0.73
Smart Green	70	26	0.58	0.67
Smart Blue	50	26	0.57	0.65
Bluish Breeze	70	1	0.55	0.63

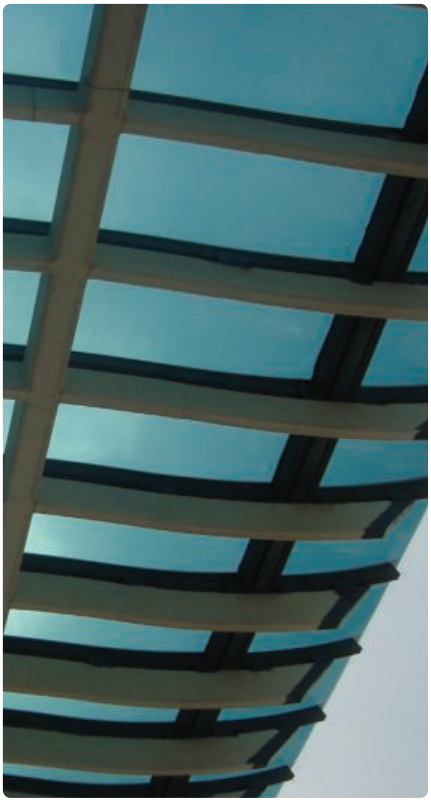
Note: Other colors are available upon request, subject to minimum quantity.

SolarSmart™ - Energy Efficiency

SolarSmart™ are energy-efficient colors break the traditional ratio between light transmission and shading coefficient. SolarSmart™ panels block Infrared energy that causes heat buildup, and transmit "cool light" that reduces air-conditioning and lighting costs.

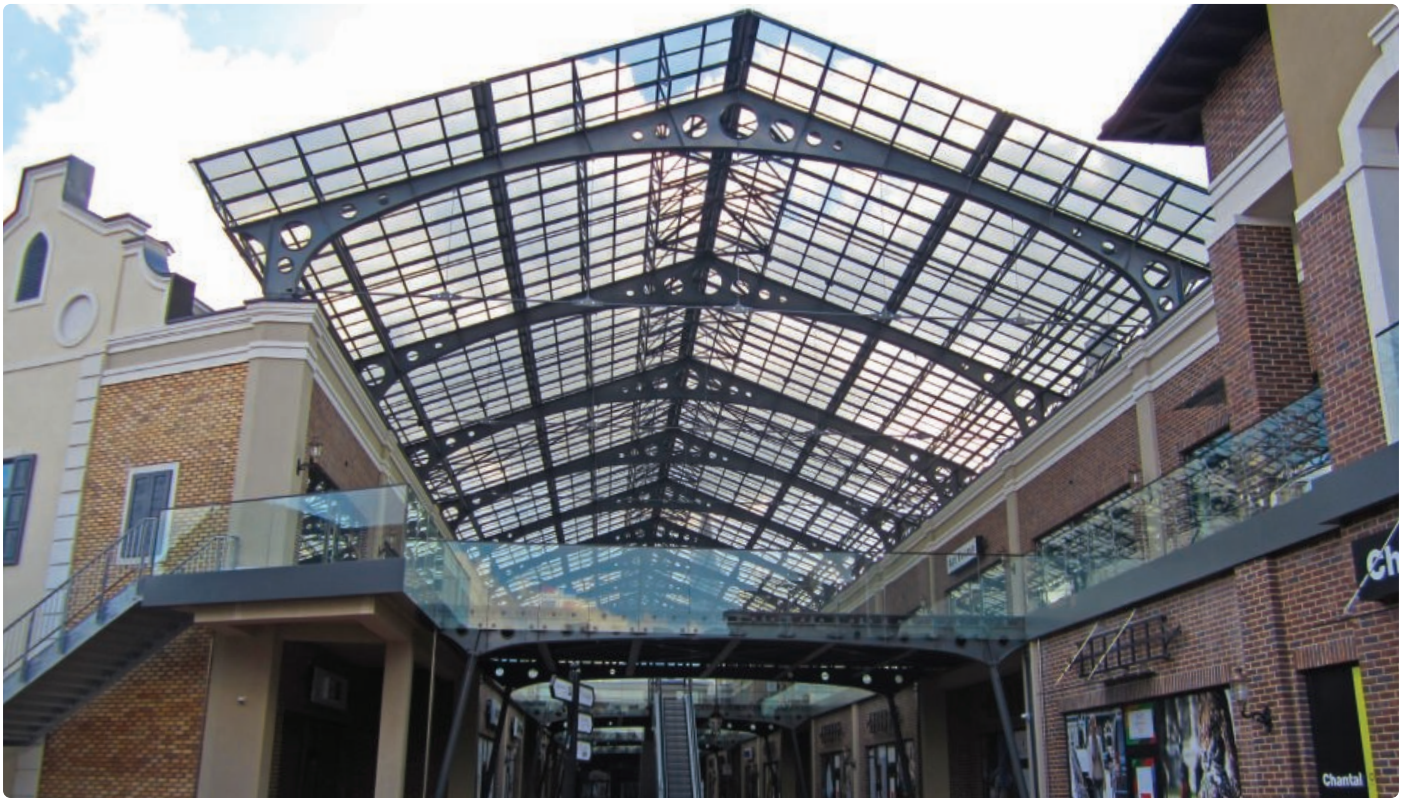
SUNGLAZE™ Projects

Hangzhou Airport, China | **Architect:** ZIAD | **Application:** Canopies - 1,900 sqm | **SUNGLAZE™ Type:** Solar Olympic 4/600



Project: The Barker Hotel, Australia | **Application:** Pergola | **SUNGLAZE™ Type:** Clear 4/600

Manufactura Outlet Village - Kiev, Ukraine | **Application:** Skylight/Roof - 1,800 sqm | **SUNGLAZE™ Type:** 4/800 Solar Grey



Anvers Confectionery - Tasmania, Australia | **Application:** Roof and wall glazing - 80 sqm | **SUNGLAZE™ Type:** 4/800 Solar Grey

The Cheese Shop at Burnie - Tasmania, Australia | **Application:** Industrial Sidelights | **SUNGLAZE™ Type:** 4/800 Clear

Project: Derby school - Kansas, USA | **Application:** Canopy - 150sqm | **SUNGLAZE™ Type:** 4/600 White Opal 28%

Thermal Insulation

The attached table compares "U" values of glass and Sunglaze panels of equivalent thickness. For any given thickness, the "U" value of Sunglaze is better than that of glass. This can result in a significant 6.5-9% reduction in energy expenditure both for heating in winter and air-conditioning during the summer time. Note that the use of SolarSmart™ panels will partially block heat generating infrared solar energy, which will further assist in reducing the air-conditioning costs during summer time.

Thickness (mm)	SUNGLAZE™ U Value (W•m²•K)	Glass U Value (W•m²•K)
3	5.43	5.79
4	5.29	5.76
6	5.04	5.52

Flammability

SUNGLAZE complies with the most demanding international fire resistance standards in the field of plastics, as indicated in the detailed table herein. The classification is subject to product type, thickness and color.

Product	Standard	Classification*
SUNGLAZE™	EN13501	B, s1, d0
	ASTM D-635	CC1
	ASTM D-1929	628°C
	ASTM D-2843	Smoke Density <75
	Standard	Classification*
SUNGLAZE™ FR	E-84	Class A

* For more detailed information please contact your Palram distributor.

Typical Physical Properties

Property	Method**	Conditions	Units	Value
Mechanical				
Density	D-792		g/cm^3	1.2
Tensile modulus of elasticity	D-638	1 mm/min	Mpa	2,300
Flexural strength	D-790	1 mm/min	Mpa	93
Flexural modulus	D-790	1.3 mm/min	Mpa	2,600
Notched impact strength Izod	D-256	23°C	J/m	800
Impact falling dart	ISO 6603/1d	3mm	J	158
		4mm		180
		6mm		>310
Impact - fall through	E-695		m/kg	336
Charpy Impact after Xenon Arc Exposure (D-6110)	D-2565-08	3000 hrs	% Loss of Impact Strength	<10
Thermal				
HDT (Heat Deflection Temperature)	D-648	Load: 1.82Mpa	°C	135
Vicat softening temperature	D-1525	Load: 1kg	°C	150
Service temperature - Short term			°C	-50 to 120
Service temperature - Long term			°C	-50 to 100
Coefficient of linear thermal expansion	D-696		cm/cm °C	6.5×10^{-5}
Thermal conductivity	C-177		W/m °K	0.21
Specific heat capacity	C-351		kJ/kg °K	1.3
Weathering				
Color change	D-2244	60 months	ΔE	<3
Yellowing index	E-313	60 months	Δ Yellowness Index	<10
Light transmission	D-1003	10 years	%	<6
Leakage / Structural				
Water leakage	E-283	20 psf		none
Air leakage	E-331	6.24 psf (Condition of air leakage test)	cfm/ft^2	0.05
Uniform load	E330 / TAS 202-94		psf	+/- 150psf (ULS)

*Properties in the table relate to the polycarbonate glazing panels in the Sunglaze system. **ASTM method except where noted otherwise.
*** All tests results are pending sheet thickness

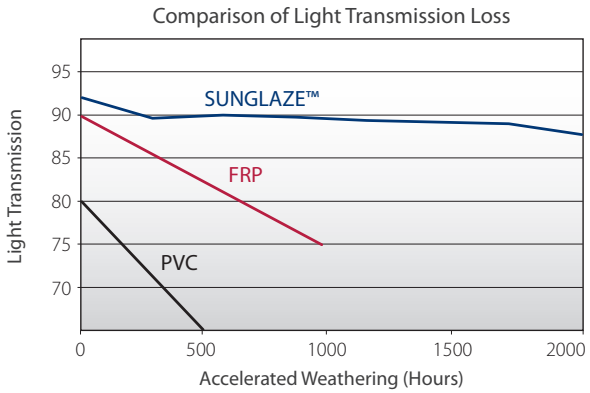
Acoustic Properties

Sunglaze panels sound insulation properties are indicated in the table to the right. The attenuation of sound waves together with its impact resistance, has made Sunglaze a material of choice for cladding.

Thickness	Acoustic Insulation DIN 52210-75 RW (db)
3mm	23
4mm	24
6mm	26

Resistance to UV Radiation

Palram polycarbonate panels retain their mechanical properties and transparency throughout a long time of external service due to integrated co-extruded UV protection. The protection will not peel off over time. Sunglaze is offered with upper-side UV protection as standard, although a UV2 version with protection on both sides is available upon request. The attached graph presents typical results from Sunglaze panels tested under accelerated weathering (QUV exposure simulation) that is equivalent to 20 years of actual field exposure. The light transmission of Sunglaze was essentially stable.



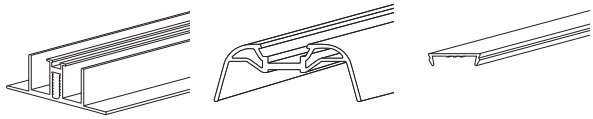
Chemical Characteristics

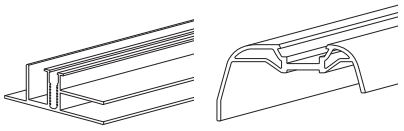
A wide listing of Palram's polycarbonate sheets resistance to chemical agents is available from the Chemical Resistance of Palram Polycarbonate Products brochure at Palram websites. For more details please contact your Palram distributor.

System Principles

Glazing Set

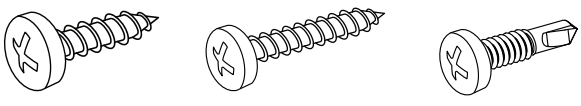
The Base is an extruded aluminum profile in natural anodize finish. Its maximum length is 6m. The Base is the lower part of the glazing set, placed under the panels and fixed to the structure by the Fixing screws. The Cap is an extruded aluminum profile in natural anodize finish. Its maximum length is 6m. The Cap is the upper profile of the glazing assembly, positioned onto the panel raised edges and Base, and attached to the Base by the Locking screws.
The Cap-Plug is 19.5mm wide aluminum strip in natural anodize finish. Its maximum length is 6m. The Plug is snapped into place onto the Cap, concealing the Locking screws from the top, and providing a smooth surface.





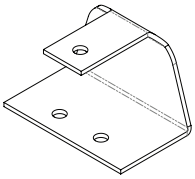
Screws

The fixing screw is a cross-head self drilling screw, 4.8x19mm (#10x0.75") for metal structure and a cross-head selftapping screw, 4.8x25mm (#10x1") for wood structure.
These screws fix the Base to the structure.
The locking screws are cross-head tapping screw, 5.5x19mm (#12x0.75") for 3&4mm and 5.5x25mm (#12x1") for 6mm. These screws attach the Cap onto the Base.

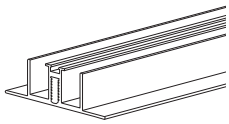
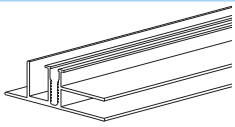
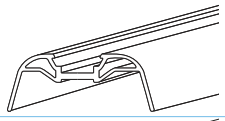
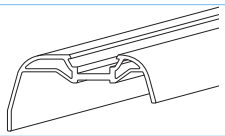
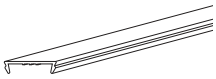
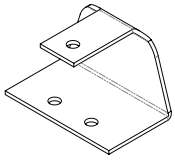
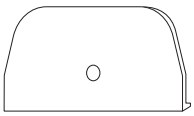
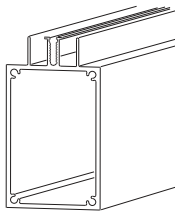


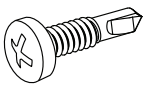
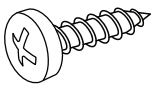
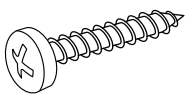
End Closure

These mill finished aluminum plates plug at both ends of the profiles assembly.



System Components

Component	Drawing	Thickness	Finish	Suppliance Data
Inner Profile Base		3mm	Anodize	Length: Up to 6m
		4mm	Anodize	
		6mm	Grey paint	
End Profile Base		3mm	Anodize	Length: Up to 6m
		4mm	Anodize	
		6mm	*Available per minimum quantity	
EPDM Gasket		3mm	Black	Length: linear meter
		4mm	Black	
		6mm	*Available per minimum quantity	
Inner Profile Cap		3mm	Black	Length: Up to 6m
		4mm	Black	
		6mm	Grey paint	
End Profile Cap		3mm	Anodize	Length: Up to 6m
		4mm	Anodize	
		6mm	*Available per minimum quantity	
Cap Plug (For inner & End Cap)		3mm	Anodize	Length: Up to 6m
		4mm	Anodize	
		6mm	Grey paint	
Inner profile End Closure		3mm	Mill finish	Unit
		4mm	Mill finish	
		6mm	Mill finish	
End profile End Closure		3mm	Mill finish	Unit
		4mm	Mill finish	
		6mm	*Available per minimum quantity	
Spanbar *Available per minimum quantity		3mm	Anodize	Length: Up to 6m
		4mm	Anodize	
		6mm	Anodize	

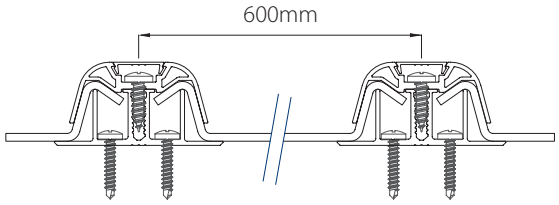
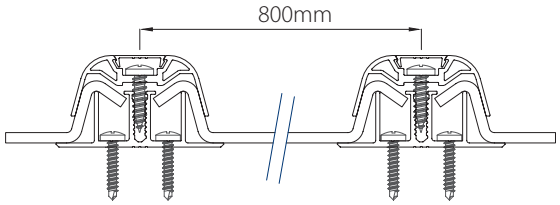
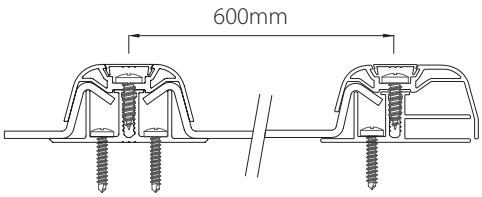
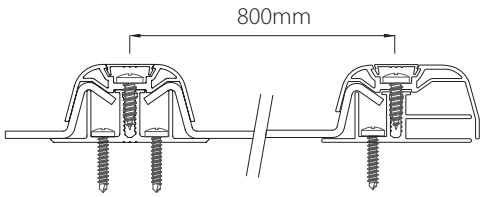
Component	Drawing	Thickness	Dimensions	Finish	Suppliance Data
Pan-Phillips Self-drilling fixing screw		3mm	4.8x19 (#10x3/4")	Galvanized	Unit
		4mm	4.8x19 (#10x3/4")	Galvanized	
		6mm	4.8x19 (#10x3/4")	Galvanized	
Pan-Phillips locking screw		3mm	5.5x19 (#12x0.75")	Galvanized	Unit
		4mm	5.5x19 (#12x0.75")	Galvanized	
		6mm	5.5x25mm (#12x1")	Galvanized	
Pan-Phillips Seld-tapping fixing screw		3mm	4.8x25mm (#10x1")	Galvanized	Unit
		4mm	4.8x25mm (#10x1")	Galvanized	
		6mm	4.8x25mm (#10x1")	Galvanized	

Installation Data

Roof Structure

Sunglaze system is designed for both rafter and purlin construction options, flat or curved. The recommended minimum roof slope for Sunglaze applications is 5%. For lower slopes - rafter design is recommended.

Assembled System Width

SUNGLAZE™ 3/600 and 4/600	SUNGLAZE™ 4/800 and 6/800
	
	

Maximum Spans Between Purlins

Type	Rafter Centers	Single Span (mm)					
		75 kg/m²	100 kg/m²	125 kg/m²	150 kg/m²	175 kg/m²	200 kg/m²
3/600	600	900	820	760	NA	NA	NA
4/600	600	900	820	760	720	680	NA
4/800	800	820	745	690	NA	NA	NA
6/800	800	900	820	760	720	680	650

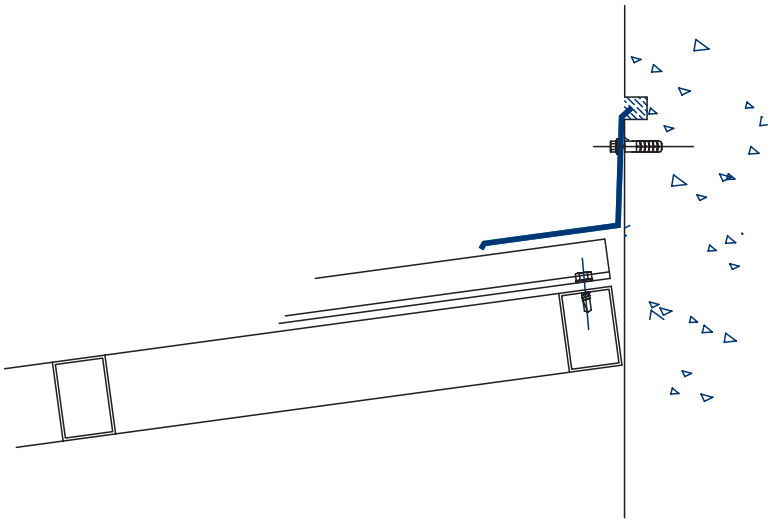
Type	Rafter Centers	Multi-Span											
		Mid-Span (mm)						End-Span (mm)					
		75 kg/m²	100 kg/m²	125 kg/m²	150 kg/m²	175 kg/m²	200 kg/m²	75 kg/m²	100 kg/m²	125 kg/m²	150 kg/m²	175 kg/m²	200 kg/m²
3/600	600	1540	1400	1300	NA	NA	NA	1210	1100	1020	NA	NA	NA
4/600	600	1540	1400	1300	1220	1160	1110	1210	1100	1020	960	910	870
4/800	800	1400	1275	1180	NA	NA	NA	1100	1000	925	NA	NA	NA
6/800	800	1540	1400	1300	1220	1160	1110	1210	1100	1020	960	910	870

Notes:
1. The values are based on maximal deflection criteria of L/200 for the aluminum profiles and L/20 for the Polycarbonate panels.
2. The dimensions depicted do not supersede the requirements of local construction codes.
3. In case of rafter installation, the distance between fixing screws should be 500 mm.

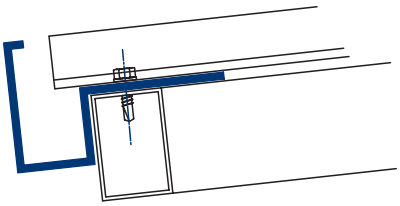
Assembly Details

The drawings below are available for download as CAD files from the SUNGLAZE web page at Palram websites.
Please note: The drawings show suggested installation procedures for Sunglaze. All parts shown in the drawings aside from the system components are not provided by Palram.

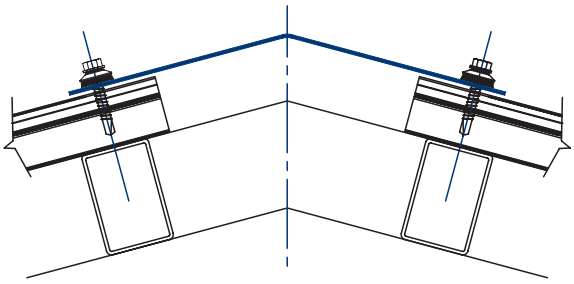
Wall - Roof detail



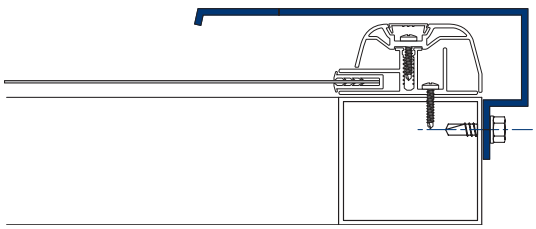
Gutter detail



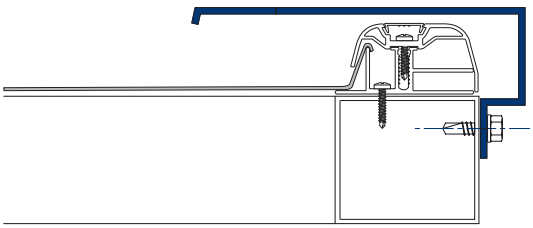
Ridge Cap detail



Side flashing



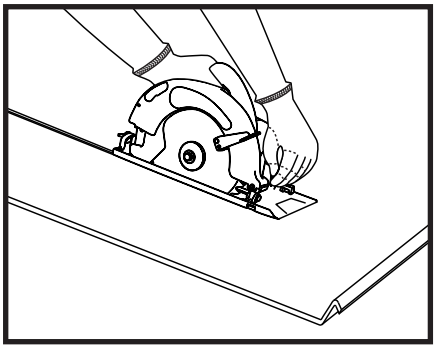
Cut end panel



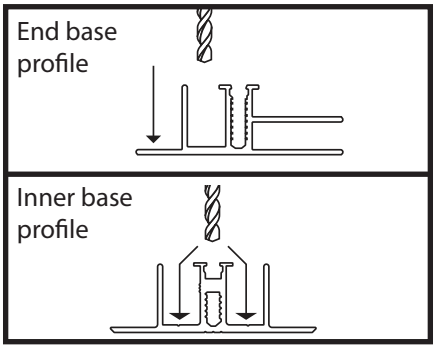
Whole end panel

Installation Guidelines

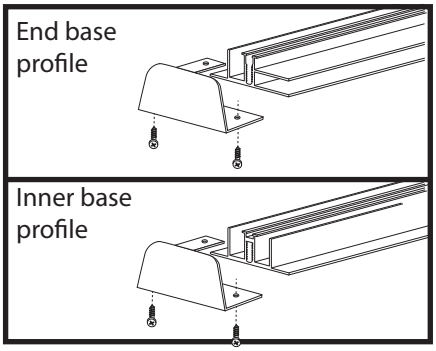
A Cut to size



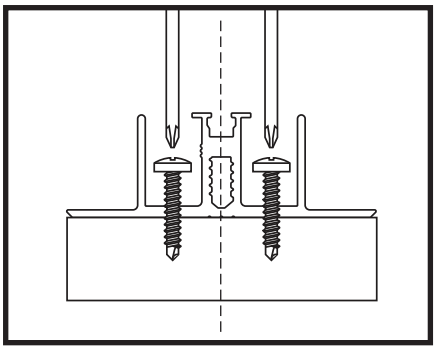
B Pre-Drilling



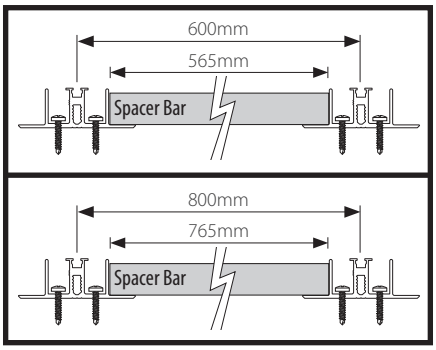
C Profile End Closure (Top & Bottom)



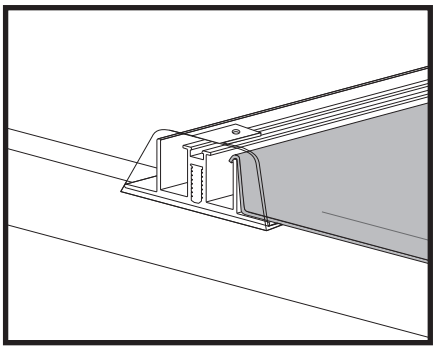
D Fix inner base profile



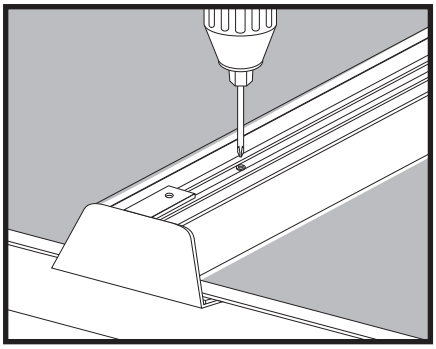
E Fix next inner base profile



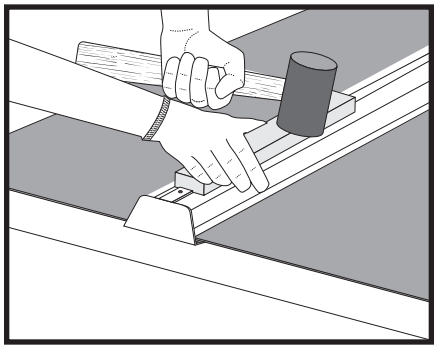
F Position first panel



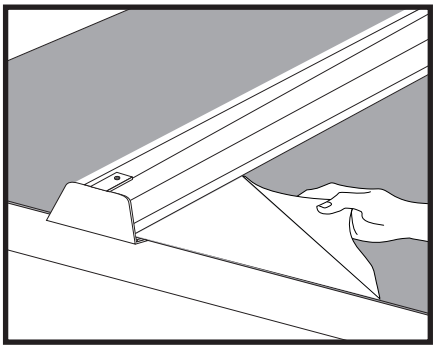
G Fix inner cap profile



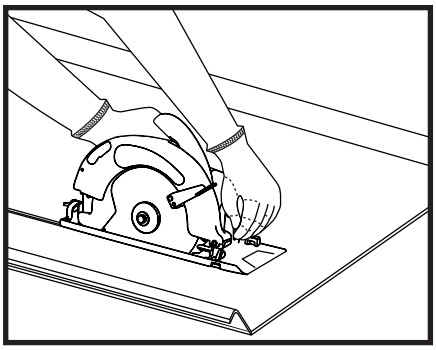
H Assemble cap plug



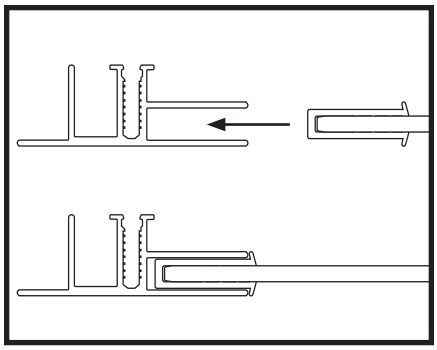
I Remove outer masking



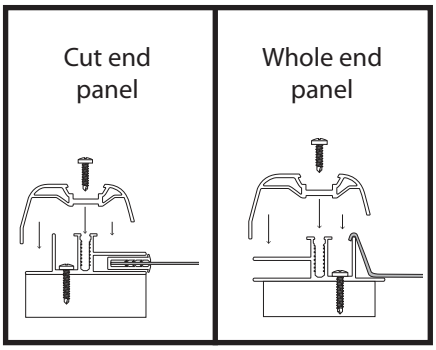
J Cut side panels to size



K Fix end base profile



L Fix End cap profile



1. Cut to size (Fig. A)
Cut the aluminum profiles to length, allowing for overhangs of up to 150mm at each end. An overhang minimum of 50mm over the end-purlin into the gutter is recommended. Cut the panels 10mm shorter than the aluminum profiles if the roof length is shorter than 3 meters, and 20mm shorter than the aluminum profiles if the roof length is 3 meters, up to 6 meters for expansion allowance. Use a circular saw or hand saw with fine tooth blades and moderate feeding rate for easier and finer cutting.

2. Pre-Drilling (Fig. B)
NOTE: When installing over a structure skip to step 3.
When installing over a wood structure, measure the purlin distance and pre-drill 6mm screw holes in each End Base Profile and Inner Base Profile. Take into consideration the overhangs over both ends.

3. Profile End Closure (Fig. C)
On ground level, fasten the end closures to the top and bottom ends of every End Profile Base and Inner Profile Base.

4. Fix the inner base profile (Fig. D)
Set the first inner base profile at the precise centerline of the supporting structure and fix it to the structure using the provided fixing screws. Fix two screws at each purlin or by the recommended span on rafters. Locate the fixing screws at both base sides - two screws for every junction between base and structure.

5. Fix next inner base profile (Fig. E)
Locate the center line of the next inner base profile at 600mm (for 3/600 and 4/600) or 800mm (for 4/800 and 6/800) from prior inner base center line, and fix it as described in step 4.
IMPORTANT! Measure and mark the inner base profile centerline at every purlin, or at every screw location on a rafter. It is highly advisable to prepare and use a spacer rod. (Note: in order to avoid accumulated deviations, do not fix more than 1-2 base profiles ahead of the actual assembly).

6. Remove inner masking
Remove the protective masking from the bottom surface of the panel (the face to contact the supportive structure). Keep the unprotected side away from the roof structure until final positioning of the panel, to avoid scratching.

7. Position first panel (Fig. F)
Position the first panel onto the base. Make sure the panel is correctly seated along its entire length.

8. Fix inner cap profile (Fig. G)
After two adjacent roof panels are in place, position the inner cap profile onto the inner base profile and panel edges. Fix the inner cap profile with the provided locking screws through every hole into to the inner base profile. The screws on both ends of the inner cap should be located a maximum of 50mm from each profile end. (Note: Drill an additional 6mm hole at the end of the inner cap profile if needed).

9. Assemble cap plug (Fig. H)
Snap the cap plug into place on top of the inner cap profile using a rubber mallet, performing moderate strikes with short intervals. Use a piece of wood to disperse the impact of the mallet and avoid damage to the profile pieces.

10. Remove outer masking (Fig. I)
Remove the protective masking from the panel's external face shortly after installation. Delaying the removal of the masking can make it very difficult to remove later. (Note: On hot days remove the top protective film immediately after installation to prevent the film from bonding to the panel!)

Repeat stages steps 4 to 10 until all inner panels (except of the edge panels) are installed.

11. Cut end panels to size (Fig. J)
Determine the required width of the end panels and cut them to size. Use a circular saw or hand saw with fine tooth blades. They should also have a moderate feeding rate for easier and finer cutting. (Note: Sometimes the end panel does not need to be cut)

12. Fix end base profile (Fig. K)
If the end panel was cut, on ground level, set the provided EPDM gasket along the end panel cut edge and insert the end base profile onto it. Take the assembly to the roof and fix it to the structure using the provided fixing screws.
If the end panel was not cut, fix the end base profile to the structure as described in step 5. Make sure the open channel is facing out.

13. Fix end cap profile (Fig. L)
Position the end cap profile onto the end base profile and panel edges. Fix the end cap profile with the provided locking screws through every hole and into to the end base profile. The screws on both ends of the end cap profile should be located at a maximum of 50mm from each profile end. (Note: Drill an additional 6mm hole at the end of the inner cap profile if needed).

14. Assemble cap plug
Snap the cap plug into place on top of the end cap profile using a rubber mallet, performing moderate strikes with short intervals. Use a piece of wood to disperse the impact of the mallet and avoid damage to the Profile pieces.

15. Side flashings
These purpose made flashings are not supplied by Palram and are used on the structure sides as a flashing.

Notes:
1. The SUNGLAZE system does not require the use of silicones or adhesives for parts interfaces. For sealing of flashing assemblies' use only Palram approved accessories, silicones, sealing tape, and closure fixtures etc.
2. To clean SUNGLAZE panels, use a pressure washer with a fanned spray nozzle and allow natural drying. Do not use cloth, sponge, chamois or similar accessories. Doing this might scratch the panels and harm their appearance.

Manufacturer's Lifetime Warranty

Sunglaze panels are guaranteed for water leak-proof performance for 25 years. Sunglaze panels bear a limited lifetime warranty not to lose more than 6% of light transmission for 10 years and no more than 1% per year thereafter, when measured according to ASTM D1003-77. Sunglaze panels are warranted for up to 10 years from the date of purchase not to break or fail as a result of impact by hail measuring up to 20mm in diameter, in speed of up to 21m/s.

Please note: Warranties only apply to installations and maintenance that follow Palram installation instructions and specifications.

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