

SUNPAL[®]

Multiwall Polycarbonate Standing Seam Architectural System



SUNPAL® Multiwall Polycarbonate Standing Seam Architectural System



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Introduction

SUNPAL is an advanced multiwall polycarbonate panel system that combines proven design, light transmission, thermal insulation and strength. It offers a lightweight, leak-proof design that withstands very high loads and accommodates expansion and contraction. The system's distinct advantages make it ideal for long-term application on many types of projects. As with any true architectural glazing system, SUNPAL is appropriate for a variety of roofing and cladding designs, flat or curved.

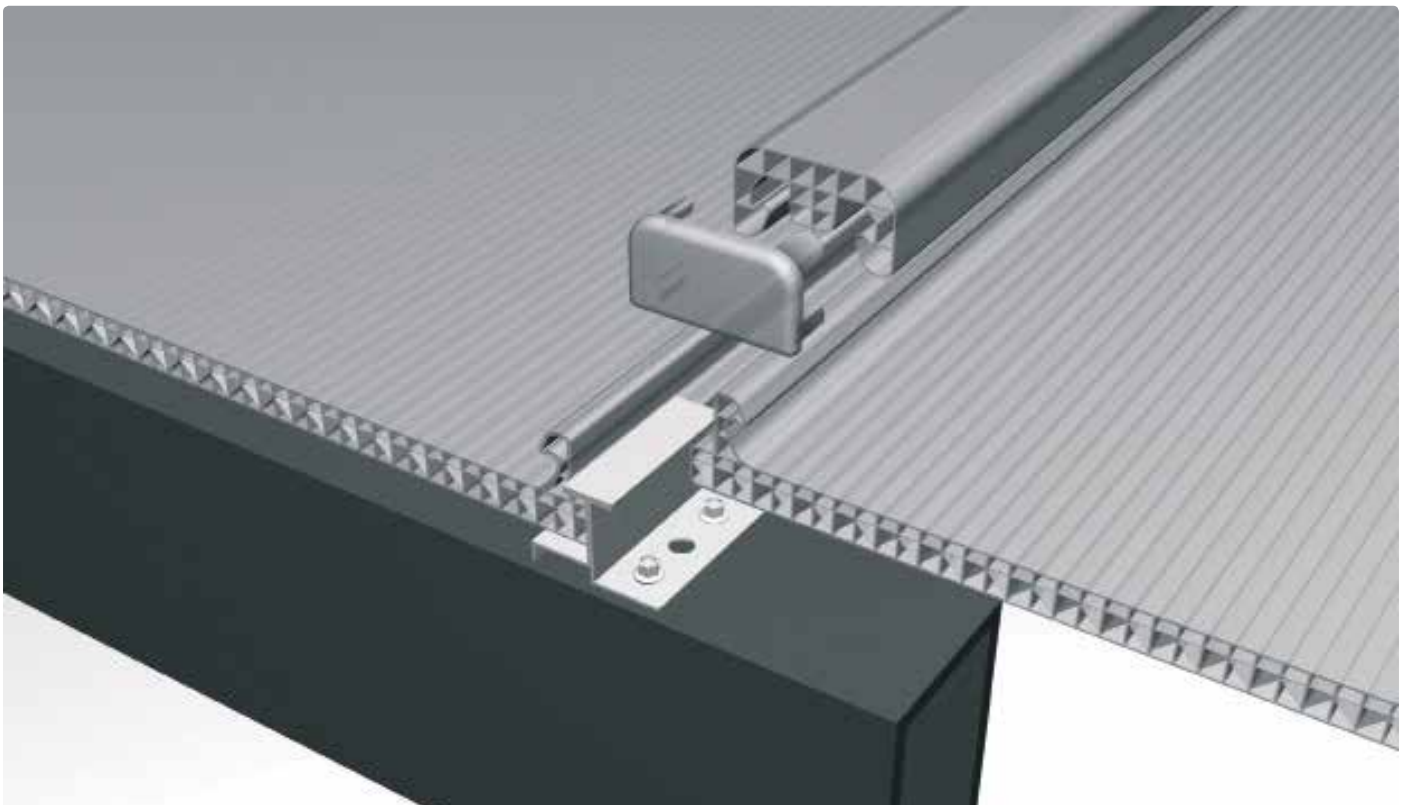
SUNPAL is a self-fastening system, based on multiwall panels, and is available in a range of thicknesses. The panels join together by polycarbonate or aluminium joiners, which are sealed at the ends by End-Caps. T-Fasteners fix the entire system to the structure, allowing the panels to be clamped in place, without any point fastener penetration through the panels. Ventilated Sealing Tape seals the panel lower end, to prevent dirt from entering the flutes, while also providing sufficient drainage. Optional Aluminium Sealing Strips or F-Profiles can be used to seal the upper and lower ends of the panels. Aluminium F-Profiles finish off side edges of the panels, creating a fully framed installation.

Main Benefits

- X Withstands very high loads
- X Accommodates expansion & contraction
- X Simple & fast installation
- X Leak-proof
- X High thermal insulation
- X Ideal for curved designs
- X Double sided UV protection
- X SolarSmart™ cool light colors

Applications

- Architectural roofing & glazing
- Commercial and retail roofing
- Sport facilities - translucent roofing
- Covered walkways, awnings & entrances
- Open markets - light roofing
- Service stations - translucent roofing
- Parking structure covering
- Swimming pool covers

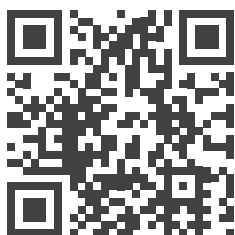


Panel Types
























SUNPAL panels are of multiwall structure, available by thicknesses of 8mm, 10mm, 18mm and 20mm. Standard SUNPAL panels have UV protection on both sides (specific order can be produced with UV protection on one side only). Maximum panel length is 11.980 (typical stock length).

Type	Panel Data	Drawing
SUNPAL® 8/600	Width: 600mm Height: 23.5mm Height with PC-Joiner: 31mm Weight: 1.24 Kg/m, 2.00 Kg/m ² Min. cold bending radius: 2.0m	
SUNPAL® 10/600	Width: 600mm Height: 25.5mm Height with PC-Joiner: 33mm Weight: 1.56 Kg/m, 2.60 Kg/m ² Min. cold bending radius: 2.4m	
SUNPAL® 18/1000	Width: 1000mm Height: 33.5mm Height with PC-Joiner: 41mm Weight: 3.11 Kg/m, 3.11 Kg/m ² Min. cold bending radius: 3.0m	
SUNPAL® 20/1000	Width: 1000mm Height: 35.5mm Height with PC-Joiner: 43mm Weight: 3.19 Kg/m, 3.19 Kg/m ² Min. cold bending radius: 3.0m	

Scan for product
video overview



Colors

Color	SUNPAL® 8/600 & 10/600			SUNPAL® 18/1000 & 20/1000		
	%LT	SHGC	SC	%LT	SHGC	SC
 Clear	65	0.63	0.72	50	0.54	0.62
 Bronze	25	0.40	0.46	20	0.35	0.39
 Solar Grey	30	0.45	0.52	24	0.44	0.51
 White Opal	25	0.37	0.43	20	0.30	0.34
 White Ice	50	0.56	0.64	40	0.48	0.55
 Green	50	0.56	0.64	38	0.46	0.53
 Blue	50	0.60	0.69	36	0.50	0.57
 Red	20	0.52	0.60	20	0.44	0.50
 White / Bronze	10	0.29	0.34	10	0.29	0.34
 White / Solar Grey	10	0.29	0.34	10	0.29	0.34
 White / Blue	10	0.37	0.43	10	0.37	0.43
 White / Red	4	0.28	0.32	4	0.28	0.32
 Solar Ice	20	0.28	0.32	15	0.23	0.26
 Solar Control	20	0.30	0.34	15	0.25	0.29
 Bluish Breeze	34	0.32	0.38	34	0.33	0.38
 Clear	64	0.63	0.72	49	0.54	0.61
 Bronze	20	0.42	0.44	20	0.37	0.43
 White Opal	26	0.40	0.45	20	0.33	0.38
 Green	40	0.48	0.54	25	0.38	0.44
 Blue	40	0.51	0.59	25	0.41	0.48
 Red	20	0.47	0.55	15	0.39	0.45
 Solar Ice	20	0.35	0.41	15	0.30	0.35
 Grey	30	0.42	0.49	30	0.41	0.48

SolarSmart™
Selective Solar Control Technology
Multi/Layer

DiffuserPlus™

Legend

LT (Light Transmission) = The percentage of incident visible light that passes through an object.

SHGC (Solar Heat Gain Coefficient) = The percentage of incident solar radiation transmitted by an object, which includes the direct solar transmission and the part of the solar absorption radiated inward.

SC (Shading Coefficient) = The amount of the sun's heat transmitted through a given window compared with that of a standard 3mm thick single pane of glass under the same conditions.

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.

More energy-saving, natural visible light is transmitted.



DiffuserPlus™

DiffuserPlus™ - Double Diffusion Effect

DiffuserPlus™ offers double diffusion which prevents both transmitted and reflected light from excessive glare.

SUNPAL® Project Gallery

Huizhou Olympic Sports Centre Stadium, China | Architect: CCDI | Application: Skylight - 6,700sqm | SUNPAL® Type: 10mm Clear



Fun City Mall, Coimbatore, India | Architect: Arris Architects | Application: Skylight - 3,700sqm | SUNPAL® - Solar Control 10mm



Project: Whitten Oval Community Sports Hall, Australia | Architect: Peddle Thorp Melbourne | Application: Curtain Wall | SUNPAL®: Solar Ice 18mm



Project: National Tennis Centre - Melbourne, Australia | Architect: Jackson Architecture | Application: Sidelight | SUNPAL® Type: 10mm Blue



Project: Fun City Mall - Coimbatore, India | Architect: Arris Architects | Application: Skylight | SUNPAL® Type: Solar Control 10mm



Project: Griffith University at Gold Coast, Australia | Application: Study Pod Walling | SUNPAL® Type: 8mm Clear



Project: James Boag Brewery, Australia | Application: Sidelight | SUNPAL® Type: 10mm White Ice



Project: Private Home - Brisbane, Australia | Application: Residential Pergola | SUNPAL® Type: Solar Control 10mm



Typical Physical Properties

Property	Method*	Conditions	Units	Value
Density	D-792		g/cm ³	1.2
Heat deflection temperature (HDT)	D-648	Load: 1.82 MP	°C	130
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 x 10 ⁻⁵
Tensile strength at yield	D-638	10 mm/min	MPa	62
Elongation at break	D-638	10 mm/min	%	>80
Impact falling dart	ISO 6603/1		J	40-400
Practical Thermal expansion/contraction rate			mm/m	3
Coefficient of linear thermal expansion	D-696		cm/cm °C	6.5 x 10 ⁻⁵

*ASTM method except where noted otherwise

Thermal Insulation

Type	U-Value [Watts/m ² ·°C]	R-Value [m ² ·°C/Watt]
SUNPAL Lite 8 mm	2.45	0.41
SUNPAL 8 mm	2.45	0.41
SUNPAL 10 mm	2.10	0.47
SUNPAL 18/20 mm	1.50	0.67

Flammability

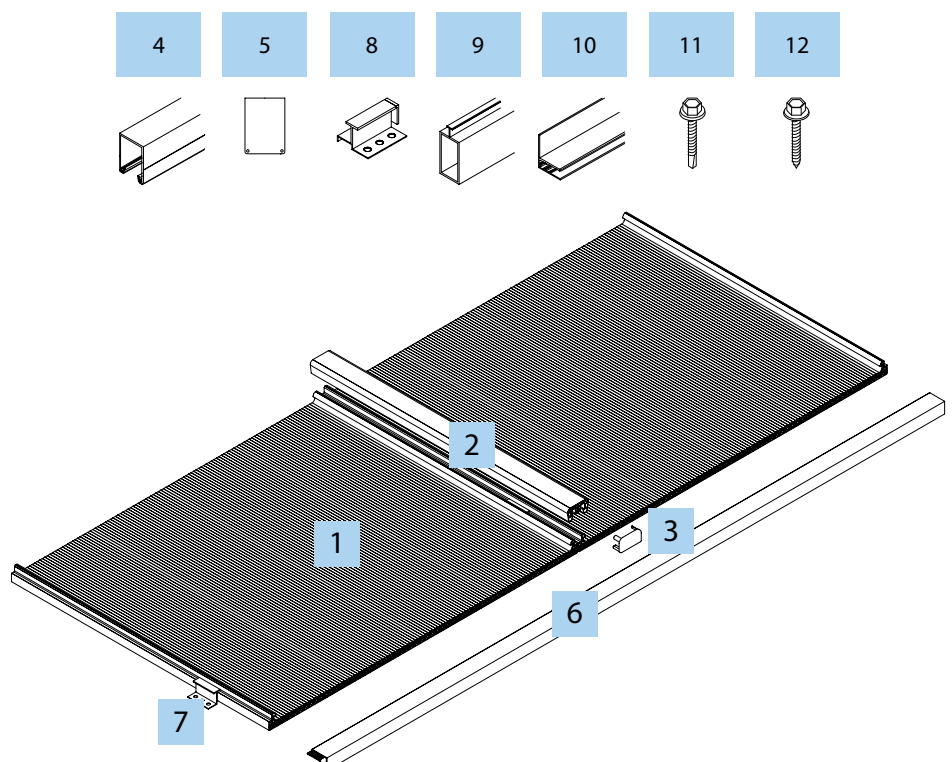
SUNPAL flammability classification appears in the attached table, based on a test performed by certified independent laboratories. The quoted certificate represents the flammability performance of the entire system.

Standard	Description
EN 13501 : 2007	European Fire Test Compliance
AS 1530.3 - 1999	Early Fire Hazard Test

*Depends on panel thickness.

Assembly Details

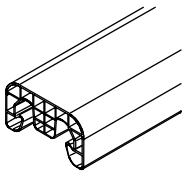
#	Legend
01	Panel
02	PC Joiner
03	End-Cap for PC Joiner
04	Aluminium Joiner 54&100mm
05	Aluminium Joiner End-Cap 54&100mm
06	Aluminium Sealing Strip
07	T-Fastener
08	T-Lock
09	Aluminium Span-Bar
10	Aluminium F-Profile
11	Metal Screw
12	Wood Screw



SUNPAL® Principles

A SUNPAL system is primarily defined by the panel thickness. All other components are selected to match this panel.

Joiners

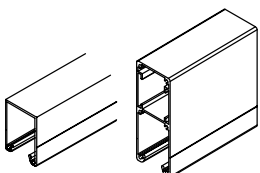


Polycarbonate Joiner

The Joiners (PC or aluminium) fit all panel types. The choice between them is usually decided by the application: PC Joiner for roofing (or any situation where the seam is external); Alu-Joiner 'C' for cladding (hidden seam).

The PC Joiner is 23mm high and 39mm wide, extruded polycarbonate colored to match the panels. Maximum length is 11.980mm, with weight of 160gr/m. The PC-Joiner should overhang about 100mm beyond the last fastener.

End-Cap for PC-Joiner is a clear acrylic cap, designed to plug the PC-Joiner ends. This end-cap prevents water and dirt from entering the joiner, it helps to reinforce the joiner ends, and provides styled appearance to the systems ends.



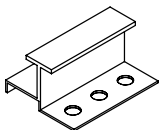
Aluminium Joiners

Aluminium Joiner is an extruded aluminium profile 39mm wide and 54mm & 100mm high with mill finish. Maximum length is 12,000mm. The Aluminium Joiner should overhang about 250mm beyond the last fastener.

Aluminium Joiner End-Cap 54mm & 100mm is a mill-finish aluminium plate designed to close the Aluminium Joiner ends. This end-cap is fixed by inserting four screws into the joiner end face.

Note: for curved applications, polycarbonate joiners can be cold-curved. Aluminium joiners have to be pre-curved.

Fasteners

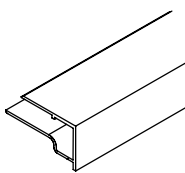


T-Fastener

T-Fastener - SUNPAL roofing system is attached to the supporting structure by the T-Fasteners. These are stainless steel concealed clips that are fixed onto the structure with screws. The fasteners have four different sizes to match each panel type. For installing SUNPAL system onto wooden structure, the T-Fasteners are fixed with Wood Screws. For metal structure, Metal Screws are used. As standard, each fastener is fixed with two screws. For high wind areas, using three screws per fastener is recommended.

T-Lock (part 08) - To prevent "travelling" of the panels, it is recommended to fix one T-Lock at a certain fixing point along each Joiner. This will be the only longitudinal fixed point, while all other fixings of this panel are floating, by regular T-Fasteners. It is a special T-Fastener with added stopper plate, which fits into a slit cut in the attached panels (prepared on spot).

Sealing & end cap Strips



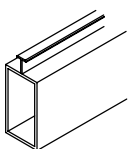
Alu End Cap

The Alu Sealing Strips are mill-finished aluminium profiles in four sizes, to match each type of panel. Maximum length is 6000mm (stock length). These are used as a closure for the panels ends, to prevent penetration of dirt and moisture, and provide efficient drainage.

Alu F Sections are available in four sizes to match each panel type. These aluminium profiles are provided pre-finished in lengths of 6500mm.

The F Profiles are generally used for side fixing and also applicable as upper-end closure.

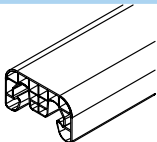
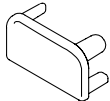
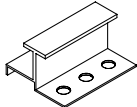
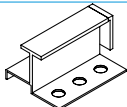

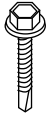
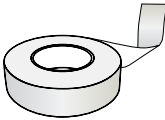
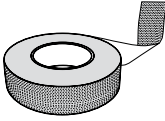
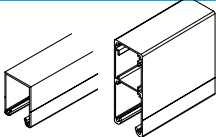

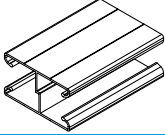

Alu Span-Bar [Sizes (mm): 65, 75, 85, 100, 150]

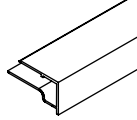
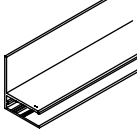
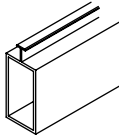
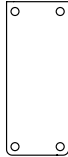
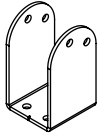
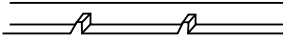


Aluminium Span Bar

The Alu Span Bar is an aluminium hollow bar that can be used as a rafter on a structural frame. It can be straight or curved (by pre-rolling), and designed to perform both as a rafter and a fastener (no "T" Fastener is required when using Span-Bars). Span-Bars come in 5 sizes to match each panel type, and its maximum length of 12000mm.

System Components

Component	Part No. (Type)	Drawing	Suppliance Data
PC Joiner	SUNJP		Length: 11.980mm Colors: panel matched
End-cap for Polycarbonate Joiner	SUNJPEC		Quantity: Sold each Colors: Natural Clear
T-Fastener	SUNTFAST8 (8mm) SUNTFAST10 (10mm) SUNTFAST18 (18mm)		Quantity: Sold each Sizes: 8mm, 10mm, 18mm, 20mm Finish: Stainless
T-Lock	SUNTLOCK8 (8mm) SUNTLOCK10 (10mm) SUNTLOCK18 (18mm)		Quantity: Sold each Sizes: 8mm, 10mm, 18mm, 20mm Finish: Stainless
Wood Screw Hex-head timbre screw 8gx35mm Class 3	SCRTH8x35		Quantity: Bags of 50 each
Metal Screw Hex-head metal screw 8gx20mm Class 3	SCRMH8x20		Quantity: Bags of 50 each
Aluminium (Solid) Tape	8mm: 92698 10mm: 92699 18mm & 20mm: 92804		Optional on special order
Breather (Ventilated) Tape	8mm: 92696 10mm: 92697 18mm & 20mm: 92802		Optional on special order
Aluminium Joiner - 54mm Aluminium Joiner - 100mm	SUNJA54 SUNJA100		Length: 12m Finish: Mill / Pre-Finished
End-Cap for Aluminium Joiner 54mm	SUNJAEC		Finish: Mill / Pre-Finished
Aluminium H Joiner For 8mm / 10mm / 18mm	SUNHJA3.0 SUNHJA6.0		Length: 6m Finish: Mill / Pre-Finished
M6 Bolt for fixing Aluminium Joiner at 1000mm center			53 x M6 Quantity Each

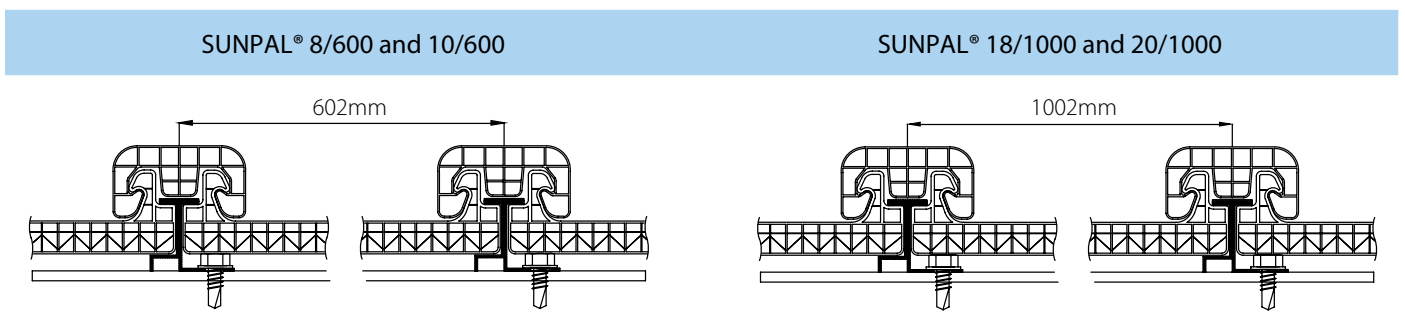
Component	Part No. (Type)	Drawing	Suppliance Data
Aluminium End Cap	SUNSEC8 (8mm) SL10AEC (10mm) SUNSEC18 (18mm)		Length: 6m Finish: Mill Pre-Finished
Aluminium F-Profile	SUNFSECTION8 (8mm) SUNFSECTION10 (10mm) SUNFSECTION18 (18mm)		Length: 6.5m Finish: Mill Pre-Finished
Aluminium Span-Bar	SUNSB60 (for 8mm) SUNSB75 (for 8mm) SUNSB85 (for 10mm) SUNSB100 (for 18mm) SUNSB150 (for 18mm)		Length: 12m Finish: Mill Pre-Finished
Span-Bar End Cap	SUNSB60EC 60mm SUNSB75EC 75mm SUNSB85EC 85mm SUNSB100EC 100mm SUNSB150EC 150mm		Finish: Mill Pre-Finished
Saddle Bracket	SUNSBAD50 - Saddle Brackets 50 SUNSBAD100 - Saddle Brackets 100		Finish: Supplied in Zinc or Stainless Steel
Compressed Foam to suit 8 and 10 mm SUNPAL	SUNFOAM 8/ 10 SUNFOAM 18		

Installation Data

Roof structure

SUNPAL system fits for both rafter and purlin construction. The recommended minimum roof slope for SUNPAL applications is 5%. For lower slopes rafter design is recommended.

Assembled System Width



Purlin Design - Recommended spans (For wind load of 1kPa)

Type (mm)	Panel Width (mm)	Polycarbonate Joiner		Aluminium Joiner 54	
		Mid-Span (mm) ▲▲▲▲	End-Span (mm) ▲▲	Mid-Span (mm) ▲▲▲▲	End-Span (mm) ▲▲
SUNPAL 8 mm	600	1050	825	1,600	1,200
SUNPAL 10 mm	600	1,250	950	1,800	1,400
SUNPAL 18/20 mm	1,000	1,350	1,000	1,800	1,400

Rafter Design - Recommended Spans (With maximum intervals of T-Fasteners along rafters for wind load of 1kPa)

Type (mm)	Rafter Centers (mm)	Polycarbonate Joiner		Aluminium Joiner 54	
		Internal Fasteners (mm)	Fasteners at Rafter Ends (mm)	Internal Fasteners (mm)	Fasteners at Rafter Ends (mm)
SUNPAL 8 mm	602	1050	825	1,600	1,200
SUNPAL 10 mm	602	1,250	950	1,800	1,400
SUNPAL 18/20 mm	1,002	1,350	1,000	1,800	1,400

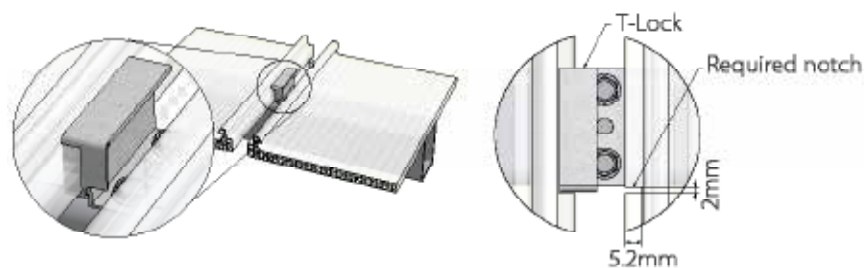
- Notes:
1. The above spans are specified for wind loads of 1000 Pa (21 psf) in roofing applications. For vertical or internal applications, contact your local SUNPAL distributor.
 2. In curved applications, Aluminium Joiners will have to be pre-rolled, while Polycarbonate Joiners can be cold curved to the roofing radius.

Maximum Spans Between Purlins

Panel Type (mm)	Multi-Span																		
	Single Span (mm)						Mid-Span (mm)						End-Span (mm)						
	75 kg/m ²	100 kg/m ²	125 kg/m ²	150 kg/m ²	175 kg/m ²	200 kg/m ²	75 kg/m ²	100 kg/m ²	125 kg/m ²	150 kg/m ²	175 kg/m ²	200 kg/m ²	75 kg/m ²	100 kg/m ²	125 kg/m ²	150 kg/m ²	175 kg/m ²	200 kg/m ²	
8	850	750	700	650	600	550	1150	1050	900	850	800	750	900	825	700	665	625	585	
10	950	850	800	750	700	650	1350	1250	1100	1050	1000	950	1050	975	860	820	780	740	
18	1100	1000	950	900	850	800	1500	1400	1300	1200	1150	1100	1170	1090	1015	930	900	860	
20	1200	1100	1000	950	900	850	1600	1500	1400	1300	1250	1200	1250	1170	1090	1015	975	935	

- Notes:
1. When using an Aluminium Joiner rather than a Polycarbonate Joiner, span data in the above table can be increased by 5%.
 2. For specific data or any other planning consultation, please contact Palram's Marketing Support department.
 3. The values are based on deflection criterion of L/20 of the Polycarbonate panels.
 4. The table is valid for purlin installation only.
 5. The dimensions depicted do not supersede the requirements of local construction codes.

T-Lock Installation



Over Hang / Cantilever

Profile	Joiners	Aluminium Joiners
8mm multi	75mm	150mm
10mm multi	100mm	200mm
18mm multi	150mm	350mm
20mm multi	150mm	350mm

* See above for maximum cantilever using either polycarbonate or aluminium joiners.

Manufacturer's 15 Years Limited Warranty

Manufacturer's Details

Palram Industries (1990) Ltd., Address: c/o Palram Australia Pty.Ltd., ACN102 673 932, 16 Merri Concourse, Campbellfield VIC 3061 | Tel: 03-9357 9240 | email: salesvic@palram.com.au

Scope of Warranty

In addition to any rights and remedies under Australian Consumer Law, the Manufacturer warrants (subject to the conditions set out below) as follows:

Light Transmission

the Product shall not lose more than 8 % of its light-transmitting capability (hereinafter "decrease") for a period of 15 years from the commencement date, as defined below, as a direct and exclusive result of solar radiation impact (as measured pursuant to the procedures specified in ASTM D-1003-77).

Color

The Product shall not display a change in color of more than 15 units delta E (hereinafter "decrease") for a period of 15 years from the commencement date as a direct and exclusive result of the impact of solar radiation (as measured pursuant to the procedures specified in ASTM E-308-85).

Breakage

For a period of 15 years (Sunpal 10-20mm) and for a period of 10 years (Sunpal 8mm) from the commencement date, the Product shall not break due to loss of impact strength as a direct and exclusive result of weathering and/or, shall not break as a direct and exclusive result of the impact of hail, measuring up to 20mm diameter, attaining a velocity of up to 21 m/s. (Loss of above capability shall be hereinafter referred to as "breakage").

Excessive loss of impact strength will be determined by test according to ISO 6603/1-1985(E) and/or ASTM D-5628-95 method F, to be applied on a sample of the broken sheet. This warranty applies only if the sample will be brittle broken in this test into separate pieces (shatter).

Commencement Date

The commencement date shall be the date of the Product's manufacture or - if such date does not appear on the product - the date upon which the product was purchased from the Manufacturer.

Limitations

This warranty shall be valid only for the original purchaser, and only if the product is handled, stored, cleaned, installed and maintained in accordance with the Manufacturer's written instructions.

This warranty will not apply to SUNPAL panels that were exposed to abrasion, scratching, or harmful chemicals.

Panels that were thermo-formed or vacuum-formed are excluded from this warranty.

Claims and Notifications

Every warranty claim must be notified in writing to the Manufacturer within the warranty period and immediately after occurrence of decrease or breakage, enclosing the original sales receipt and this warranty; The claimant must allow the Manufacturer to inspect any or all of the sheets involved and the installation site itself while the sheets are still in their original position and have not been removed or moved or altered in any way and/or return the sheets to the Manufacturer for testing.

The Manufacturer reserves the right to investigate independently the cause of any failure.

Compensation

If a claim under this limited warranty is justified, the Manufacturer will provide the purchaser with free substitute product or, at its exclusive discretion, refund the original purchase price paid to the Manufacturer, or a portion thereof, in accordance with the following schedule:

In the event the Manufacturer is duly notified of decrease or breakage within 7 (Seven) years of the commencement date, and a claim upon such decrease or breakage is properly made and approved, the Manufacturer will provide free substitute product or, at its exclusive option, refund the original purchase price.

In the event the Manufacturer is duly notified of decrease or breakage after more than 7 (Seven) years from the commencement date, and claim upon such decrease or breakage is properly made and approved, the Manufacturer will provide substitute product.

The replacement price to be paid by the purchaser will be 6.66 % of the Manufacturer's effective price at the time of replacement, multiplied by the number of years from commencement date to replacement time, but not exceeding 53% of the Manufacturer's then effective price.

The Manufacturer at its exclusive option may refund the difference between the effective price and the replacement price as above, instead of providing substitute product.

The Manufacturer's liability does not include any costs of removal and installation of panels and the manufacturer will not be liable under this limited warranty for any other claim for direct or indirect damage or loss or for consequential loss arising from failure.

Jurisdiction

This limited warranty shall be governed by and shall be construed according to the laws of the State of Israel. The Israel court in Haifa shall have the exclusive jurisdiction.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if goods fail to be of acceptable quality and the failure does not amount to a major failure.

11/2014 The data in this publication supersedes previous releases. For the latest update refer to our website: www.palram.com.au

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