
ALPHA SOLAR TECH
The Future
of Sustainability
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Contents

About Alpha Solar Tech

Alpha Solar Technologies Pty Ltd is an Australian revolutionary-technology company specialising in Building Integrated Photovoltaic (BIPV) Systems.

Our patented cutting-edge Nano-Layered Micro-Patterned (NLMP) technology enables the development of high-efficiency high-definition BIPV modules that convert high-rise buildings and urban infrastructure into stylish sustainable solar farms that support net-zero-energy projects.

We offer certified aesthetic glass-on-glass BIPV modules (façades, semitransparent glass windows, skylights, roof tiles, sound barriers, balustrades, and footpaths) that can replace conventional building materials or can be integrated/applied to pre existing façade and building structures.

Alpha Solar Tech's laminated BIPV modules employ (i) tempered back and front glass panels, (ii) EVA or PVB interlayers, (iii) thin-film or Mono-Si solar cells and (iv) anti-aging UV-resistance junction boxes. These laminated BIPV modules can be double glazed with low-e glass (for moderate insulation and sound proof properties) or with vacuum glass (for ultra-high insulation and soundproof properties).

Our BIPV modules improve building sustainability, create cost savings and decrease carbon footprint.

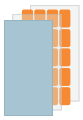
Our Warranty

10 years — 10 years on materials

25 years — 25 years power output guarantee for

90% nominal output during the first 10 years and 80% over 25 years

BIPV Applications



Solar Façades

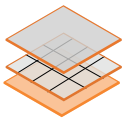
Opaque BIPV façade and semitransparent glass modules can be integrated into the building's envelope, depending on the design requirements. They can be used as claddings or integrated into curtain walls.

Solar Sound Barriers

Solar sound barrier structures comprising of coloured solar panels and/or semitransparent solar glass panels, which suppress accoustic noise levels and pollution from road traffic while producing clean energy

Solar Roof tiles

Designed to replace tradional rooftiles or shingles by blending with the surrounding roof materials with a seamless appearance.



Semitransparent Glass

Our semitransparent Cd/Te thin film solar glass panels have 20-80% transparencies and generate excellent power(30-120 Wp/m2), reducing greenhouse gases, saving on energy costs, providing attractive ROI, and offering visibility and perform just like a standard tinted window.

BIPV Module Installation Considerations

BIPV façade installations involve the incorporation of solar modules into the exterior surface of a building. Here are the installation steps that must be considered when installing BIPV systems;

Panel Design: Our BIPV modules are designed to seamlessly integrate into the building façade. They can be customized to match the architectural style and requirements of the building.

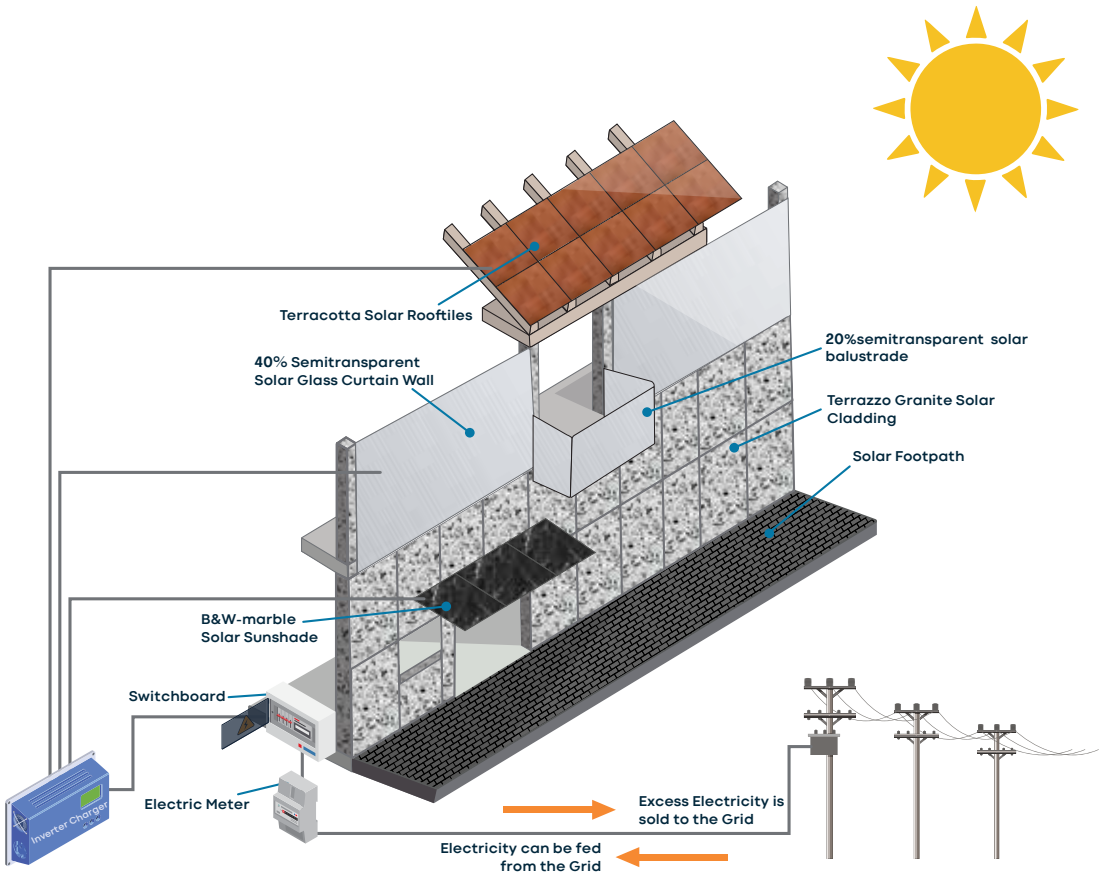
Mounting System: Is designed to attach the solar modules securely to the façade. The mounting system should be strong, durable, and compatible with the specific type of BIPV modules used.

Positioning and Orientation: The BIPV modules can be optimally positioned on the façade to maximize sunlight exposure and energy generation, based on the building's location.

Electrical Connections: Wiring and electrical connections are made to link the BIPV modules together and connect them to an inverter or power management system that converts the generated DC (direct current) electricity into AC (alternating current) electricity suitable for use in the building.

Integration with Building Components: The BIPV modules are integrated into the building facade, often acting as an external cladding material. They can be installed in a way that aligns with the building's architectural elements, such as windows, doors, or structural features.

Weatherproofing: Proper weatherproofing measures are typically taken to ensure the BIPV modules, and their mounting systems are protected from moisture, rain, and other environmental factors.



BIPV Facade/Curtain Wall Modules

Mono-Si BIPV Facade Modules

Our 1780mm x 1180mm x 13.5mm Mono-Silicon BIPV façade modules utilize high-efficiency mono-crystalline silicon solar cells embedded between the top and bottom glass panes to convert sunlight into electricity, which can be used on-site or fed into the building's electrical grid, thus contributing to sustainable energy production, reducing a building's reliance on fossil fuel based electricity, and offsetting energy costs over time.

The BIPV façade modules are constructed with durable materials and undergo rigorous testing to ensure long-term performance and reliability to withstand various weather conditions, including wind, rain, and temperature fluctuations.

Thermal Characteristics

Nominal operating cell temperature	NOCT	°C	45±2
Temperature coefficient of Pmax	γ	%/°C	-0.36
Temperature coefficient of Voc	βVoc	%/°C	0.30
Temperature coefficient of Isc	αIsc	%/°C	0.05

OPERATING CONDITIONS

Max. system voltage	1500V
Max. series fuse rating	20A
Operating temperature range	(-40°C- 85°C)
Max. static load, front(e.g.,snow)	5400Pa
Max. static load, back (e.g.,wind)	2400Pa
Max. hailstone (diameter/velocity)	25mm / 23m/s

CONSTRUCTION MATERIALS

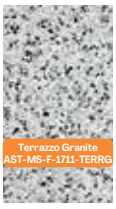
Glass (material / thickness)	Low-iron Tempered 6mm
Cell (quantity /material / dimensions)	108/mono/182*91
Encapsulating material	PVB
Junction box (protection degree)	≥IP67
Cable (length / cross-section)	300mm/4mm². Also, customised
Plug connector (type/protection)	MC4 / IP67
Weight (kg)	70.0

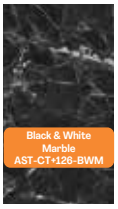
ELECTRICAL PERFORMANCE

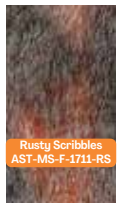
Electrical parameters at Standard Test Conditions (STC) 1780mmx1180mmx13.5mm Mono-Silicon Façade modules

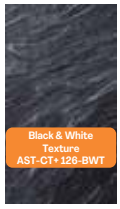
Module Type	AST-MS-F-1711-WB	AST-MS-F-1711-BG	AST-MS-F-1711-CHAR	AST-MS-F-1711-JM	AST-MS-F-1711-GW	AST-MS-F-1711-RS	AST-MS-F-1711-RB	AST-MS-F-1711-AM	AST-MS-F-1711-TERRG
Power output, W	258.9	307.3	315.9	279.3	288.2	291.7	294.5	315.3	303.0
Power output tolerance,	±5	+5	+5	+5	+5	+5	+5	+5	±5
Module efficiency, %	12.3%	14.6%	15.0%	13.3%	13.7%	13.9%	14.0%	15.0%	14.4%
Voltage at Pmax, V	65.09	64.21	63.69	63.69	63.66	64.74	67.23	64.28	63.76
Current at Pmax, A	3.98	4.79	4.96	4.39	4.53	4.51	4.38	4.91	4.75
Open-circuit voltage, V	75.13	75.24	74.90	74.62	74.63	74.98	74.86	75.34	74.52
Short-circuit current, A	4.18	5.05	5.19	4.57	4.76	4.67	5.13	5.12	4.98

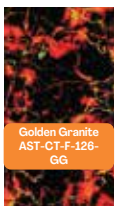
STC: 1,000 W/m2 irradiance, 25°C cell temperature, AM1.5g spectrum

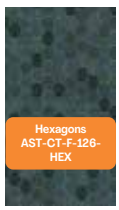


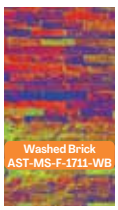












BIPV Facade/Curtain Wall Modules

CdTe BIPV Facade Modules

Our CdTe (Cadmium Telluride) BIPV façade modules, which utilize cadmium telluride as the semiconductor material, are designed to seamlessly integrate with building façades, combining solar energy generation with architectural aesthetics. CdTe thin-film solar cells are known for their good performance in high-temperature environments and their ability to generate electricity under low light conditions. These CdTe BIPV facade modules are designed to withstand various weather conditions.

System Properties (at STC)

Maximum System Voltage, V	\NSYS	1000 (600UL)
Limiting Reverse Current, A	IR	2
Maximum Series Fuse, A	ICF	2

Temperature Coefficients (at STC)

Temperature Coefficients of ISC, %/°C		0.06
Temperature Coefficients of \NOC, %/°C		–0.321
Temperature Coefficients of PM, %/°C		–0.214
Operating Temperature Range	°C	– 40 to 85

Packaging Configuration

Modules Per Pallet	30 PCS
Pallet Weight	680 kg
Pallet Dimensions	1260mm x 1080mm x 790mm
Modules per 40' Container	1080 PCS

Mechanical Specifications

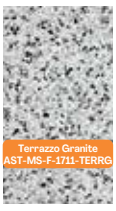
Length	1200mm
Width	600mm
Thickness	12.6mm
Area	0.72m²
Weight	20.0kg
Frame	None
Lead Cable	2.5mm² 580mm
Connectors	MC4
Bypass Diode	6A
Cell Type	CdTe
Module structure	3.2mm+1.52mm+3.2mm+ 1.52mm+3.2mm
Cover Glass	Tempered
Back Glass	Tempered
Encapsulation	PVB

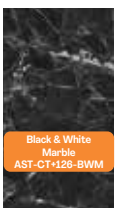
Electrical Specifications

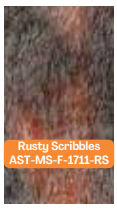
(at STC: 1kW/m2,25°C, AM 1.5)	AST-CT-F-126-RS	AST-CT-F-126-GW	AST-CT-F-126-JM	AST-CT-F-126-GG	AST-CT-F-126-BW	AST-CT-F-126-RB	AST-CT-F-126-AM
Nominal Power (Pm), W	89.98	85.48	82.13	83.67	97.87	88.48	94.32
Open Circuit Voltage (Voc), V	118.13	117.22	118.08	117.73	118.68	118.11	118.54
Voltage at max. Power (Vm), V	91.41	91.01	92.85	92.42	92.40	92.01	91.31
Current at max. Power (Im), A	0.98	0.94	0.88	0.91	1.06	0.96	1.03

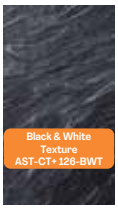
Electrical Specifications

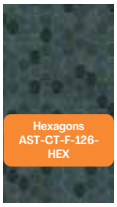
(at STC: 1kW/m2,25°C, AM 1.5)	AST-CT-F-126-TERRG	AST-CT-F-126-BG	AST-CT-F-126-CHAR	AST-CT-F-126-TE	AST-CT-F-126-WBR	AST-CT-F-126-BWT	AST-CT-F-126-HEX
Nominal Power (Pm), W	91.05	91.80	94.01	81.72	77.08	97.68	78.02
Open Circuit Voltage (Voc), V	118.34	118.34	119.00	119.12	118.34	118.68	119.02
Voltage at max. Power (Vm), V	91.94	91.90	91.90	89.56	91.10	92.35	92.23
Current at max. Power (Im), A	0.99	1.00	1.02	0.91	0.85	0.88	0.85

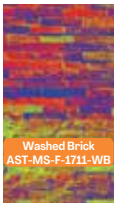










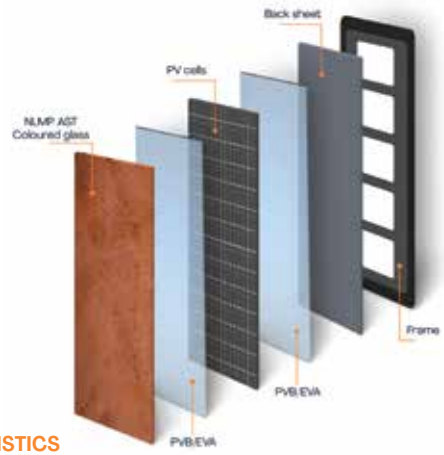


Solar Rooftile Modules

Our Mono-Silicon Building-Integrated Photovoltaic (BIPV) rooftile modules are solar panels specifically designed to withstand various weather conditions, including rain, wind, hail, and temperature fluctuations, and can be integrated into roofing systems, providing both functional solar energy generation and a visually appealing roofing solution.

They come in various shapes, sizes, and colours, allowing for seamless integration into different roofing styles and architectural designs.

	"1260x480mm BIPV Rooftile Modules			"630x480mm BIPV Rooftile Modules	AST-MS-RTR-O31
Product	**AST-MS-RT-124-B**	**AST-MS-RT-124-R**	**AST-MS-RT-124-G**	**AST-MS-RT-64-R**	31.0
Colour	black	Red	Grey	Red	14.1%
Dimensions mm²	1260x480	1260x480	1260x480	"630x480mm BIPV Rooftile module"	5.58
Weight, kg	8.5	8.5	8.5	7.5	5.56
Tempered Glass Structure, mm²	3.2x3.2			3.2x3.2	6.71
Mono-Si solar cell dimesnsions, mm²	192x91			192x91	5.93
Encapsulating material	EVA			EVA	
Junction box standard	IP67			IP67	
Cable type	900mm/4mm²			450mm/4mm2	
Plug	MC4			MC4	



Electrical Performance

Electrical parameters at Standard Test Conditions (STC)	AST-MS-RT-124-B	AST-MS-RT-124-R	AST-MS-RT-124-G
Power output, Pmax, W	90	75	78.0
Module Efficiency, %	18.90%	15.80%	16.4%
Voltage at Pma, Vmax, V	13.7	13.4	13.50
Current at Pmax, Imax, A	6.57	5.60	5.78
Open-circuit voltage, Voc, V	16.3	16.1	16.20
Short-circut current, Isc, A	6.89	5.93	6.07

STC: 1,000 W/m2 irradiance, 25°C cell temperature, AM1.5g spectrum

Operating Conditions

Max.system voltage	1500VDC
Max.series fuse rating	20A
Operating temperature range	(-40°C- 85°C)
Max.static load,front(e.g.,snow)	5400Pa
Max.static load,back(e.g.,wind)	2400Pa
Operating humidity	0-80%
Max. hailstone (diameter/velocity)	25mm / 23m/s

THERMAL CHARACTERISTICS

Nominal operating cell temperature	**NOCT**	**°C**	**45±2**
Temperature Coefficient of Pmax	γ	%/°C	−0.36
Temperature Coefficient of VOC	βVoc	%/°C	0.30
Temperature Coefficient of ISC	αIsc	%/°C	0.05

Semitransparent Solar Glass Modules

Our semitransparent Cd/Te thin film solar glass panels can generate excellent power reducing greenhouse gases, saving on energy costs, providing attractive ROI, and offering visibility and perform just like a standard tinted window.

Electrical Specifications	1200x600		1200x1200		3000x1200		1200x600
(at STC: 1000W/m², 25°C, AM1.5)	AST-CT-STG-126-40	AST-CT-STG-126-50	AST-CT-STG-1212-40	AST-CT-STG-1212-50	AST-CT-STG-3012-40	AST-CT-STG-3012-50	AST-CT-B-126-0
Nominal Power(Pm)	63 W	52W	122W	101W	310W	260W	105
Open Circuit Voltage(Voc)	122V	122V	122V	122V	122V	122V	122
Voltage at max. Power(Vm)	96V	96V	96V	96V	96V	96V	96
Current at max. Power(Im)	0.66	0.54	1.27	1.05	3.23	2.71	1.09
Transparency %*	40%	50%	40%	50%	40%	50%	0% (opaque)

* Trans parency can be customized.

System Properties (at STC)

Maximum System Voltage, Volts	V_{SYS} (V)	1000 (600UL)
Limiting Reverse Current, Amps	I_R (A)	2
Maximum Series Fuse, Amps	I_{CF} (A)	2

Temperature Coefficients (at STC)

Temperature Coefficients of Isc, %/°C	α=0.060
Temperature Coefficients of Pm, %/°C	β=-0.321
Temperature Coefficients of Pm, %/°C	γ=-0.214
Operating Temperature, °C	-40 to 85

Mechanical Specifications

Length	1200mm
Width	600mm
Thickness	6.8mm
Area	0.72m ²
Weight	12kg
Frame	None
Lead Cable	2.5mm² 580mm
Connectors	MC4
Bypass Diode	6A
Cell Type	CdTe
Module structure	3.2mm+PVB+3.2mm
Cover Glass	Annealed
Back Glass	Annealed
Encapsulation	PVB

Packaging Configuration

Modules Per Pallet	54 PCS
Pallet Weight	680kg
Pallet Dimensions	1260x1080x790mm
Modules Per 40' Container	1944PCS

Frameless Solar Balustrade Modules

Our CdTe semi transparent frameless solar balustrade modules can be manufactured with varying degrees of transparency, allowing architects to balance energy generation with desired levels of natural light transmission. Their colour and level of transparency can be customized to meet specific design requirements. Each Solar balustrade module comes with two stainless steel spigots, one of which houses the junction box.

Electrical Specifications

(at STC: 1000W/m ², 25°C, AM1.5)	AST-CT-BAL-1212-40
Nominal Power(Pm)	110
Open Circuit Voltage(Voc)	122V
Voltage at max. Power(Vm)	87
Current at max. Power(Im)	1.26
Transparency %*	40%

* Transparency can be customised.

Our solar balustrade modules can be customised.

System Properties (at STC)

Maximum System Voltage, V	V_{SYS}	1000 (600UL)
Limiting Reverse Current, A	I_R	4
Maximum Series Fuse, A	I_{CF}	4

Temperature Coefficients (at STC)

Temperature Coefficients of Isc, %/°C	0.06
Temperature Coefficients of Voc, %/°C	-0.321
Temperature Coefficients of Pm, %/°C	-0.214
Operating Temperature, °C	-40 to 85

Mechanical Specifications

Length	1200mm
Width	1200mm
Thickness	18.24mm
Area	1.44m ²
Weight	40kg
Frame	None
Lead Cable	2.5mm² 580mm
Connectors	MC4
Bypass Diode	6A
Cell Type	CdTe
Module structure	5T+SGP+3.2cells+SGP+5T
Cover Glass	Tempered
Back Glass	Tempered
Encapsulation	SGP

Packaging Configuration

Modules Per Pallet	20 PCS
Pallet Weight	800 kg
Pallet Dimensions	1260x1680x790mm
Modules Per 40' Container	720PCS

Anti-Slip Solar Footpath Modules

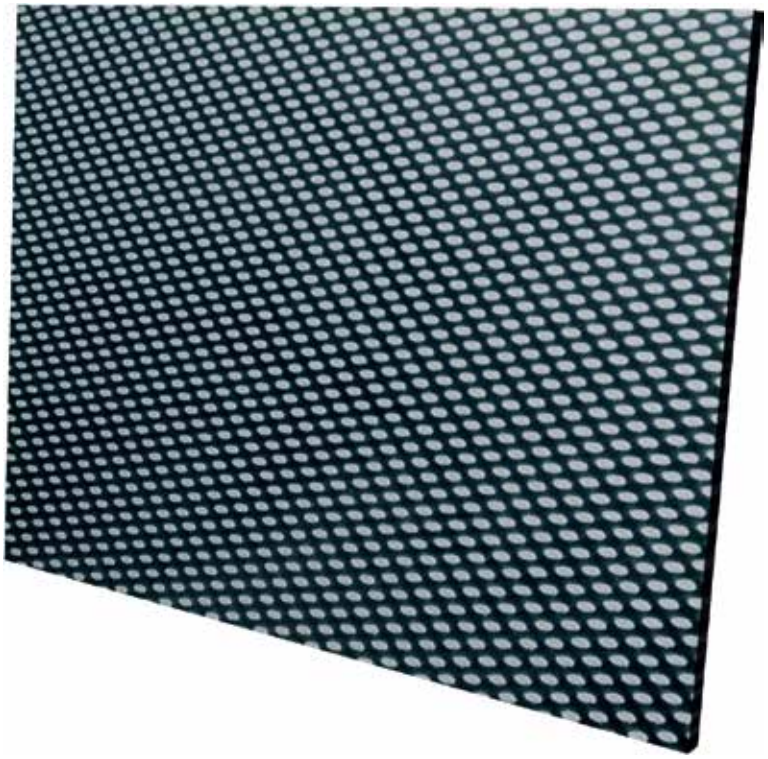
Our anti-slip solar footpath modules can be integrated into footpaths, sidewalks and other pedestrian walkways, offering several advantages, including energy savings, enhanced safety, reduced carbon footprint, and the potential for smart city integration.

The solar footpath modules are constructed with anti-slip cover glass and capable of handling various weather conditions and withstanding the weight of pedestrians.

The generated power can be used for various applications, such as lighting the footpath, charging small devices, or supplying energy to nearby infrastructure.

Electrical Specifications

(at STC: 1000W/m ², 25°C, AM1.5)	AST-CT-FP-66-B (Black)	"AST-CT-FP-66-XX (XX=Colour)"
Nominal Power (Pm), W	50.00	>40
Open Circuit Voltage (Voc), V	58.00	58.00
Voltage at max. Power (Vm), V	43.20	43.20
Current at max. Power (Im), A	1.16	>0.93



System Properties (at STC)

Maximum System Voltage, V	V_{SYS}	1000 (600UL)
Limiting Reverse Current, A	I_R	2.5
Maximum Series Fuse, A	I_{CF}	2

Temperature Coefficients (at STC)

Temperature Coefficients of Isc, %/°C	0.06
Temperature Coefficients of Voc, %/°C	-0.321
Temperature Coefficients of Pm, %/°C	-0.214
Operating Temperature range, °C	-40 to 85

Mechanical Specifications

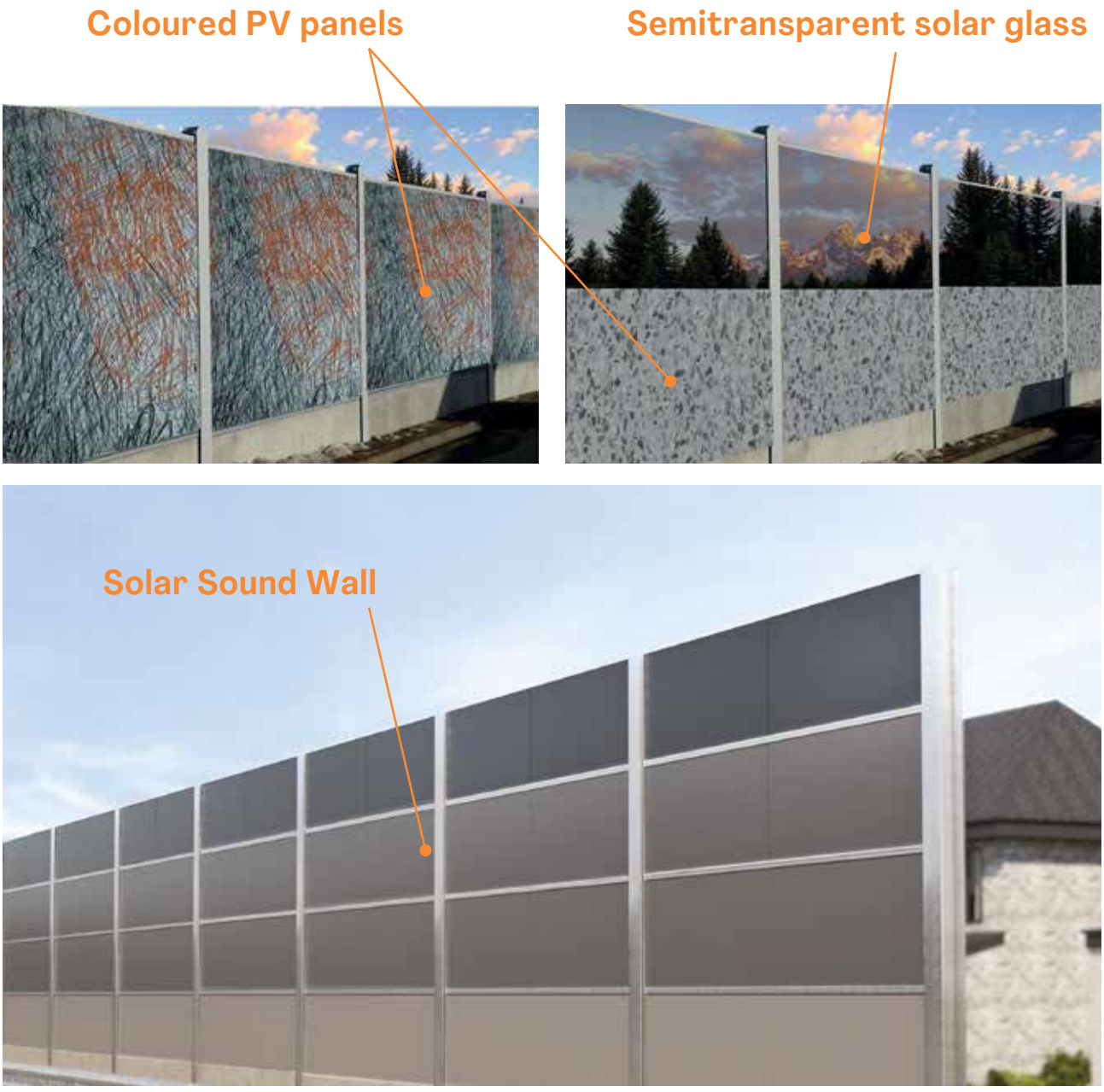
Lengthxwidth	600mmx600mm
Thickness	22mm (with junction box 40mm)
Weight	20.0kg
Frame	None
Lead Cable	2.5mm² 580mm
Connectors	MC4
Bypass Diode	10A
Cell Type	CdTe
Module structure	8T+PVB+3.2+Cells+PVB+8T
Junction box	Black, IP68
Cover&Back Glass	Tempered
Friction coefficient	>60%
Load capacity	2000 kg
Surface strength	>90 Mpa

Packaging Configuration

Modules Per Pallet PCS	customised

Solar Sound Barrier

Solar sound barrier structures comprising of coloured solar panels and/or semitransparent solar glass panels, which suppress accoustic noise levels and pollution from road traffic while producing clean energy. The energy can be stored in batteries and used to power parks & public spaces, providing power for electric cars, lighting, irrigation, traffic lights, security cameras/sensors.



Contact Our Team

1/93A Leach Hwy, Kewdale
Western Australia
+61 (08) 6239 0230