



SVMAN
2020-2021 CORPORATE BROCHURE

01

About SUNMAN

Sunman Energy is a technology company founded by a group of industry veterans delivering the future of Solar. Through the research and development of composite materials, Sunman has successfully commercialized the world's first glass-free, light-weight and flexible Panel – eArc. Replacing glass completely, eArc brings solar power to markets and applications scenarios that were previously impossible.



02

eArc technology

eArc - Ultra-light, Glass-free Technology

eArc is the world's first glassless solar module. An innovation combining proven crystalline silicon solar cells with Sunman's patented composite material, eArc has the same durability and robustness of conventional glass modules. However, unlike glass:

eArc is akin to a flexible "solar skin", 70% lighter and up to 95% thinner. eArc requires 0 penetration or mounting equipment during installation, cutting time-on-site by 40%. eArc is easier to transport in bulk - up to 60% more kW per pallet. eArc targets a variety of applications glass modules cannot service.

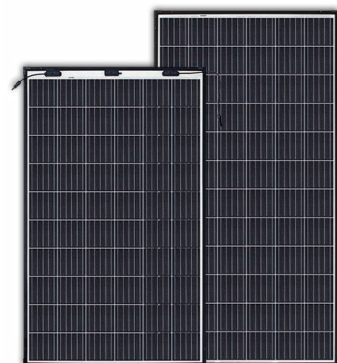
Do More with Less - eArc Applications

Sunman sees eArc as a core-enabling technology that will expand the market and deployment of solar. Currently, eArc addresses several markets that glass modules underserve, including lightweight C&I roofs, waterproof membrane roofs, vehicle integrated photovoltaics and off-grid energy. Moreover, eArc is paving the way for new innovations, gaining momentum in cross-market applications such as building materials and robotics. As of September 2020, 50 MW of eArc has been installed worldwide.

03 Products

eArc Modules

Unlike conventional glass modules, installation of eArc series does not involve penetrating or compromising the waterproofing membrane of the roof. Instead, eArc is bonded onto the surface via adhesives. eArc is extremely suited towards lightweight corrugated metal roofs, glass roofs and polymer roofs.



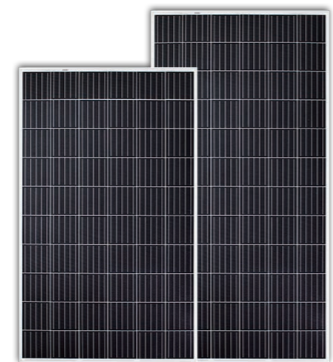
SMD Series

The SMD series is equipped with a 5.6 mm ultra-thin aluminum frame. SMD can be installed via quick-bonding or mechanical fixing, making it suitable for a variety of low load and impenetrable roofs.



SMF Series

The SMF series is frameless and has the most flexibility. This series of products is suited to many innovative cross-market applications.



SMA Series

The SMA series is equipped with a 35 mm aluminum frame. SMA can be installed with conventional mounting hardware and applied to roofs with insufficient weight bearing for glass modules.

Off-Grid



VIPV Series

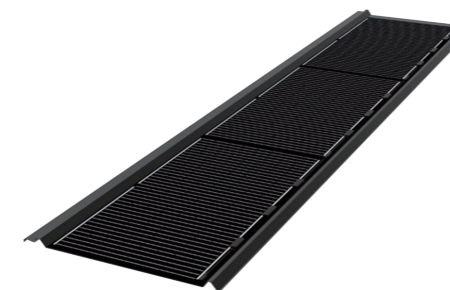
Electric and zero-emission modes of transportation, such as trains, yachts, mopeds, logistic vehicles are becoming increasingly prevalent in the modern economy. eArc can help electrify the transportation sector by increasing cruising distances and powering core functions, such as lighting, air conditioning and tail lifts.



Portable eArc Charger

Leveraging eArc technology, Sunman has developed a portable solar charger, which comes with a charge controller and an optional battery. The solar charger is perfect to support energy needs during outdoor activities and remote travels.

BIPV



eRoof

The eRoof is a prefabricated BIPV (building integrated photovoltaic) product that seamlessly integrates eArc with metal roofing sheets. Careful design attention was given to cell layout and cable management, resulting in an aesthetically pleasing construction. The eRoof maintains the same fireproofing, waterproofing and installation characteristics of traditional metal roofs.

04 Applications

Lightweight Metal Roofs

eArc is the go-to solution for roofs that suffer from structural issues. An estimated 40% of commercial and industrial roofs lack the minimum load capacity to support conventional glass modules. Glass modules can only be installed when buildings have a minimum load capacity of 15 kg/m². When buildings fall under this threshold, additional structural strengthening is required for solar to be installed, which is costly and disruptive to on-site business activities.



Waterproof Membrane Roofs

Roof membranes, such as TPO and PVC, are becoming increasingly popular waterproof covers for commercial roofs. Due to penetration issues, waterproofing membranes cannot accommodate conventional glass modules. By bonding eArc to these roofs, new solar generation capacity can be created.



Transportation

As the transportation sector strives to lower its carbon footprint, many modes of transport, such as trains, yachts, RVs and trucks look to eArc as a means to electrify core equipment, such as air conditioning, tail lifts and lighting.

Outdoor and emergency

In locations where grid access is limited, Sunman's portable products can greatly improve energy access. Simply lay the modules in an area with sufficient sunlight and connect your electronics.



Building Integrated Photovoltaics

In recent years, the substantial decrease in the cost of solar power has opened the doors for a diverse set of applications, including building integrated photovoltaics. Sunman's eRoof is a product that can be used in the construction industry, targeting both new builds and renovations.

Projects



World's First Retractable Solar Carport

Location: Switzerland

System capacity: 420 kW



Lightweight Metal Roof

Zhejiang Province, China | 600kW



Lightweight Metal Roof

Czech Republic | 100kW



Lightweight Metal Roof

Australia | 235kW



Curved Roof

Australia | 120kW



Waterproof Membrane Roof

Spain | 80kW



Glass Roof

Jiangsu Province, China | 52kW



Solar Façade
Australia | 40kW



Solar Façade
UAE | 50kW



Zero Carbon Park
Jiangsu Province, China | 90 kW + 147 kW



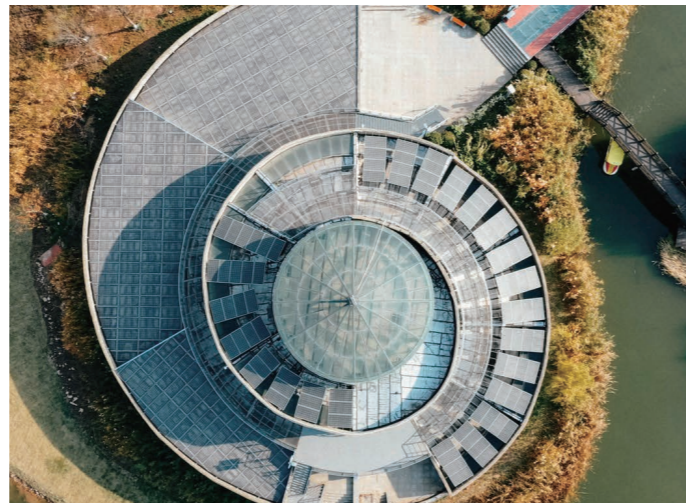
The World's First Solar Train
Location: Australia



Curved Roof
Jiangsu Province, China | 56kW



Curved Carport
UAE | 273kW



Custom Roof
Jiangsu Province, China | 100kW



Advantages

50_{MW}

Cumulative Volume

As of 2020, the historical cumulative shipment volume of eArc has reached 50 MW, with a compounded annual growth rate of 90% - ranking first in the field of lightweight and flexible solar modules.

40+

Patents

Since 2015, Sunman has been constantly innovating. As of October 2020, Sunman's R&D team has developed 41 patents, of which 19 are patents for inventions.

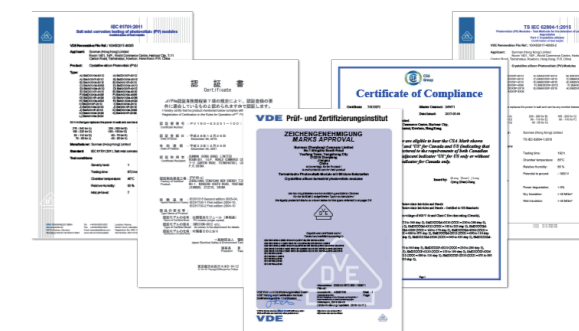
30+

Sale Territories

Sunman's sales territories cover more than 30 countries across 5 continents. Sunman will continue to expand its global reach and service new markets and regions.

20+ Professional Certifications

eArc is the first module of its kind to pass the same durability and safety tests as glass modules, including IEC 61215:2016, IEC61730:2016 and UL1703 (USA). In addition, eArc has gained regional endorsement from JET (Japan) and CEC (Australia). eArc has also passed additional module quality assessments, including 3000 hours of damp heat, UV exposure (25 years equivalent), PID, salt mist and ammonia corrosion tests.



Investors

Sunman is backed by Softbank China VC, SOUTHERN CROSS Venture Partners and CEFC (Clean Energy Finance Corporation).



Founder

Sunman is the brainchild of pioneering energy scientist and entrepreneur Dr. Zhengrong Shi. In 2000, Dr. Shi founded Suntech Power, a pioneering solar panel manufacturer that listed on the New York Stock Exchange. As an academic, Dr. Shi has published more than 100 papers and is the owner of 60 patents. Dr. Shi is also a professor at the University of New South Wales and an academician in the Australian Academy of Engineering.



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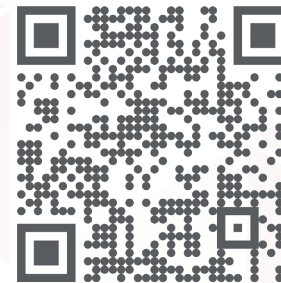
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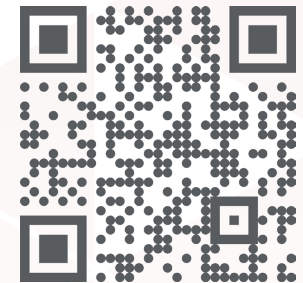
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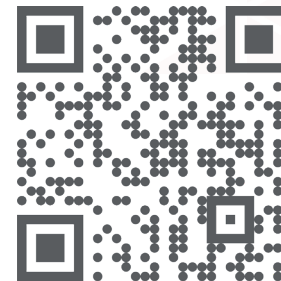
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