looking for the future

CATALOGUE

BIPV GLASS SOLAR FLOOR

INDEX

pages

COMPANY

Solar Innova is a global company in the Renewable Energy sector, mainly in the Solar fiel, both Photovoltaic and Thermal Energy, enabling our customers to improve efficiency facilities and energy while reducing environmental impact.

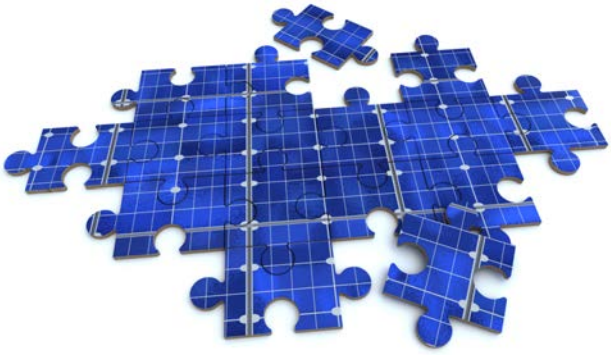
Technology plays a key role in **Solar Innova**.

We develop products with advanced technologies that allow us to be more competitive and to respect the environment. We are committed to providing our customers high quality services to meet your expectations and guarantee your complete satisfaction.

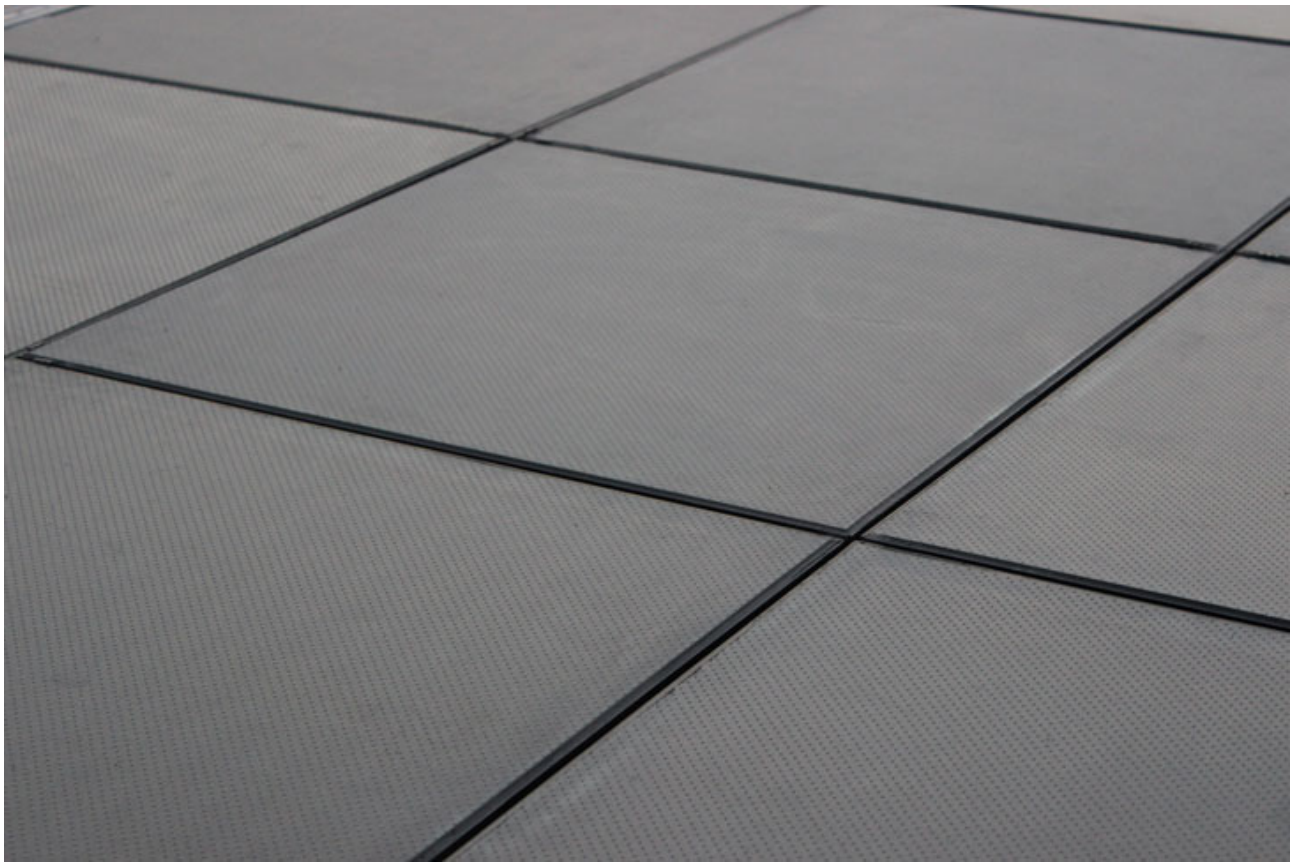
We have a distribution network in constant growth, to provide a service with maximum quality and speed.

We want to be present in all areas where is the development of alternative energy, offering added value to our products and services such as:

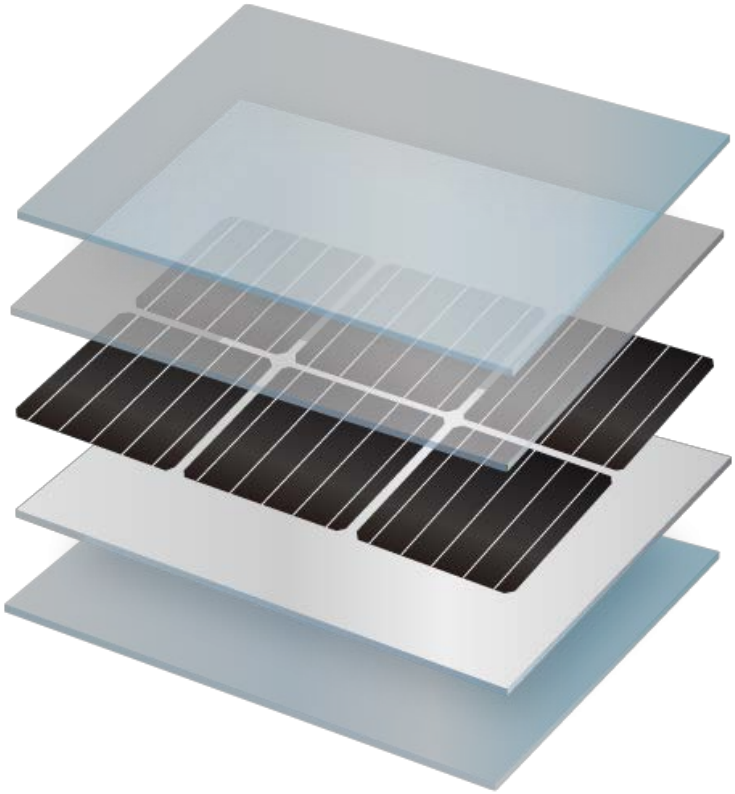
- √ Advice
- √ Competitiveness
- √ Sustainability
- √ Professionalism
- √ Service quality
- √ Certified by internationally recognized laboratories



GLASS SOLAR FLOOR BIPV

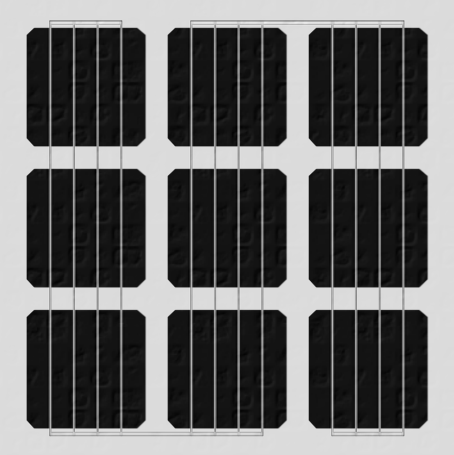


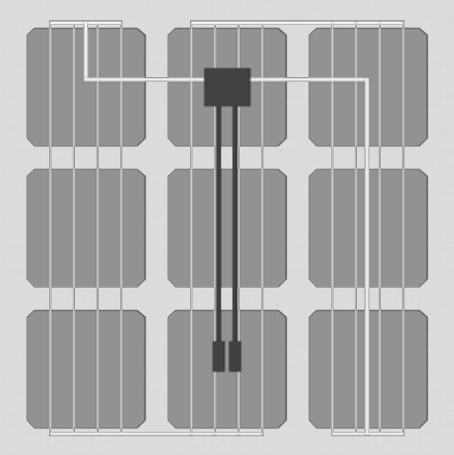
GLASS SOLAR FLOOR BIPV-MONOCRYSTALLINE-COMPONENTS



COMPONENT	DESCRIPTION
Glass	Tempered and ultra-transparent, gives rigidity to the whole and protects the active surface of cells.
PVB (Polivinil Butiral)	Its function is to encapsulate cell circuit.
Cells	Composed of high efficiency crystalline Silicon. Is the electricity generator.
PVB (Polivinil Butiral)	Its function is to encapsulate cell circuit.
Glass	Tempered and ultra-transparent, gives rigidity to the whole and protects the active surface of cells.
Junction Box	Provides simple method of electrically connecting the module to other installation.
Connectors	Easy and quickly connection.

SI-ESF-M-BIPV-FL-M156-9-45W

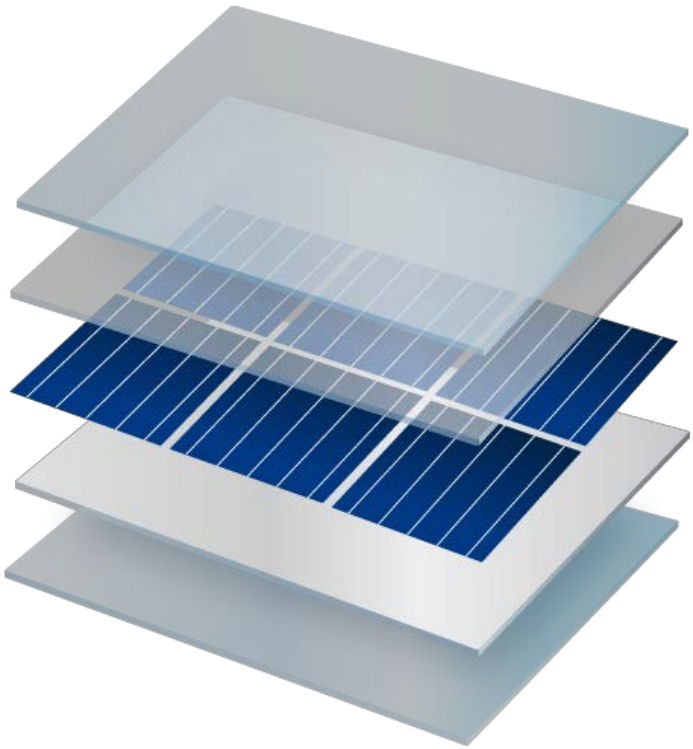




ELECTRICAL CHARACTERISTICS (STC)		
Maximum power (Pmpp)	Wp	45
Tolerance	Wp	0 ~ + 1.35
Voltage at maximum power (Vmpp)	Volts	5.35
Current at maximum power (Impp)	Amperes	9.26
Open circuit voltage (Voc)	Volts	6.33
Short circuit current (Isc)	Amperes	9.83
Maximum system Voltage (Vsyst)	Volts	715 (IEC)
Diodes (By-pass)	Quantity	2
Maximum series fuse	Amperes	10
Efficiency (ηm)	%	12.50
Form Factor	%	≥ 73

MECHANICAL CHARACTERISTICS		
Size	Height	600 mm
	Width	600 mm
	Thickness	18 mm
Weight	Net	15 kg
Front	Material	High transmission tempered glass anti-slip
	Thickness	8 ± 0.2 mm
Cells	Type	Monocrystalline
	Quantity	3 x 3 units
	Size	156 x 156 mm
Serial connection	Quantity	9 units
Parallel connection	Quantity	1 unit
Encapsulation	Material	PVB
	Thickness	0.76 ± 0.03 mm
Rear	Material	Tempered glass
	Thickness	8 ± 0.2 mm
Junction box	Material	PVC
	Protection	IP67
	Isolation	Versus humidity and inclement weather
Cables	Type	Polarized and symmetric in length
	Length	450 mm
	Section	4 mm^2
	Features	Low contact resistance
		Minimal losses for voltage drop
Connectors	Material	PVC
	Type	MC4
	Protection	IP67

GLASS SOLAR FLOOR BIPV-POLYCRYSTALLINE-COMPONENTS



COMPONENT	DESCRIPTION
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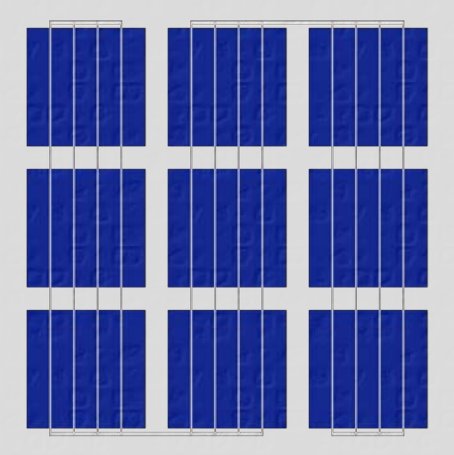
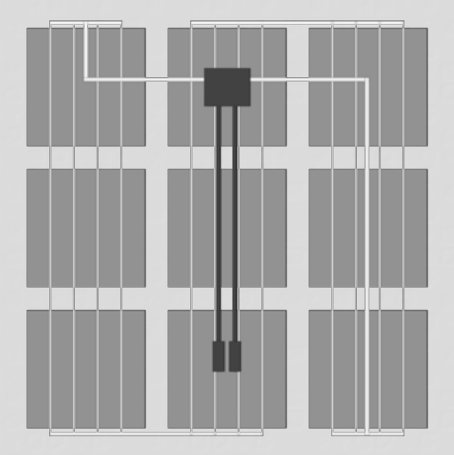
PVB (Polivinil Butiral)	Its function is to encapsulate cell circuit.
Glass	Tempered and ultra-transparent, gives rigidity to the whole and protects the active surface of cells.
Junction Box	Provides simple method of electrically connecting the module to other installation.
Connectors	Easy and quickly connection.

SI-ESF-M-BIPV-FL-P156-9-40W





ELECTRICAL CHARACTERISTICS (STC)		
Maximum power (Pmpp)	Wp	40
Tolerance	Wp	0 ~ + 1.20
Voltage at maximum power (Vmpp)	Volts	4.89
Current at maximum power (Impp)	Amperes	8.47
Open circuit voltage (Voc)	Volts	5.79
Short circuit current (Isc)	Amperes	8.99
Maximum system Voltage (Vsyst)	Volts	715 (IEC)
Diodes (By-pass)	Quantity	2
Maximum series fuse	Amperes	10
Efficiency (ηm)	%	11
Form Factor	%	≥ 73

MECHANICAL CHARACTERISTICS		
Size	Height	600 mm
	Width	600 mm
	Thickness	18 mm
Weight	Net	15 kg
Front	Material	High transmission tempered glass anti-slip
	Thickness	8 ± 0.2 mm
Cells	Type	Polycrystalline
	Quantity	3 x 3 units
	Size	156 x 156 mm
Serial connection	Quantity	9 units
Parallel connection	Quantity	1 unit
Encapsulation	Material	PVB
	Thickness	0.76 ± 0.03 mm
Rear	Material	Tempered glass
	Thickness	8 ± 0.2 mm
Junction box	Material	PVC
	Protection	IP67
	Isolation	Versus humidity and inclement weather
Cables	Type	Polarized and symmetric in length
	Length	450 mm
	Section	4 mm^2
	Features	Low contact resistance
		Minimal losses for voltage drop
Connectors	Material	PVC
	Type	MC4
	Protection	IP67

COMMON TECHNICAL FEATURES

THERMAL CHARACTERISTICS MONOCRYSTALLINE		
Temperature coefficient of short circuit current α (Icc)	%/º C	+ 0.0814
Temperature coefficient of open circuit voltage β (Voc)	%/º C	- 0.3910
Temperature coefficient of maximum power γ (Pmpp)	%/º C	- 0.5141
Temperature coefficient of current at maximum power (Impp)	%/º C	+ 0.10
Temperature coefficient of voltage at maximum power (Vmpp)	%/º C	- 0.38
NOCT (Nominal Operating Cell Temperature)	º C	+ 47 ± 2

THERMAL CHARACTERISTICS POLYCRYSTALLINE		
Temperature coefficient of short circuit current α (Icc)	%/º C	+ 0.0825
Temperature coefficient of open circuit voltage β (Voc)	%/º C	- 0.4049
Temperature coefficient of maximum power γ (Pmpp)	%/º C	- 0.4336
Temperature coefficient of current at maximum power (Impp)	%/º C	+ 0.10
Temperature coefficient of voltage at maximum power (Vmpp)	%/º C	- 0.38
NOCT (Nominal Operating Cell Temperature)	º C	+ 47 ± 2

TOLERANCES				
Working temperature	º C	º F	- 40 ~ + 85	- 40 ~ + 185
Dielectric Isolation Voltage	Volts		3,000	
Relative humidity	%		0 ~ 100	
Wind resistance	m/s		60	
	kg/m^2	Pa	245	2,400
	$lbs/feet^2$		491.56	
Mechanical load-bearing capacity	kg/m^2	Pa	551	5,400 (IEC)
	$lbs/feet^2$	Pa	75.2	3,600 (UL)
Fire resistance	Clase		C	

MEASUREMENTS PERFORMED IN ACCORDANCE WITH STANDARD TEST METHODS EN 60904-3 AND ASTM E1036, CORRECTED TO STANDARD TEST CONDITIONS (STC)		
Air quality/Spectral distribution	AM	1.5 ASTM G173-03e1 (2,008)
Luminous intensity/Radiation	W/m^2	1,000
Cell temperature	º C	25

MEASUREMENTS PERFORMED IN SOLAR SIMULATOR	
Class	AAA (according to IEC 60904-4)
Power measurement uncertainty is within	± 3 %

STRUCTURAL CHARACTERISTICS	
Cells	High efficiency cells with anti-reflective layer of Silicon Nitride.
Electric conductors	Flat Copper (Cu) bath in a Tin (Sn) and Silver (Ag) alloy, which improves weldability.
Welding	Of cells and drivers in sections for stress relief.
Laminate	Composed of ultra-clear tempered glass on the front, thermostable, EVA encapsulant embedding cells and electrical insulation on the rear formed by a tempered glass.
Junction box	Hoses and quick connectors with anti-error. Include bypass diodes, interchangeables thanks to the wiring system has no welds, all electrical contacts are made by pressure, thus avoiding the possibility of cold welding.

CHARACTERISTICS OF WORK
- The power of solar cells vary in the output of the production process. The different power specifications of these modules reflect this dispersion.
- Cells during the early months of light exposure, may experience a degradation photonics could decrease the value of the maximum power of the module up to 3 %.
- The cells, in normal, operating conditions, reach a temperature above the standard measurement conditions of the laboratory. The NOCT is a quantitative measure of the increase. NOCT measurement is performed under the following conditions: radiation of 0.8 kW/m^2, temperature 20º C and wind speed of 1 m/s.
- The electrical data reflects typical values of the modules and laminates as measured at the output terminals at the end of the manufacturing process.

WARRANTIES OF QUALITY

Solar Innova products are made with the highest quality components and the latest technology, thanks to the excellent factory equipment and control of the entire manufacturing process. In addition, our products offer excellent design and finishes.

Solar Innova has a wide range of photovoltaic solar panels that cover all market needs both feeding operation as isolated facilities. Besides offering panels that develop, manufacture and market, we give you and your company the opportunity to advise you on everything you may require, through our engineering department.

The effectiveness and excellence in all our manufacturing processes are the main guarantee that ensures the highest quality solar modules Innova.

Our production factory (certified according to ISO 9001, ISO 14001 and OHSAS 18001) meets stringent quality requirements that our organization has set: full supervision in each individual phase of the production process.

The CE or European Conformity is a European brand for certain groups of services or industrial products. It relies on the directive 93/68/EEC, 2002/95/EC, 2004/108/EC and 2006/95/EC. It was established by the European Community and the testimony by the manufacturer that the product meets the minimum legal requirements and technical security of the Member States of the European Union.

All our panels are manufactured under strict quality control and classification. Certificates IEC 61215 and IEC 61730 and characterization reports made in testing laboratories based on these standards, certify that all of our panels successfully pass the tests that have been and are suitable for use in any type of installation.

The MCS (The Microgeneration Certification Scheme) certification is a system of EN45011, which certifies the Solar Innova PV modules for use in photovoltaic systems in the UK.

The MCS is a set of internationally recognized quality assurance demonstrating the quality and reliability of products certified to exacting standards.

The MCS certificate involves evaluation of products, manufacturing processes, materials, procedures and staff training. It is also a requirement to market photovoltaic market in the UK within the program of government financial support.

Standard UL 1703 refers photovoltaic panels that meet the National Electrical Code (NEC) and the National Fire Prevention Association (NFPA) in the United States of America.

The American National Standards Institute ANSI/UL 1703 covers North American requirements for the design and testing of PV modules on the rating of the safe electrical and mechanical operation throughout their expected lifetime. The tests also demonstrate that the efficiency of the panels is tested and confirmed to reach 90 % or more of the power indicated by the manufacturer.

A photovoltaic module is recyclable day today to 80% by an adequate treatment in conscious recover raw materials, thus contributing to saving natural resources.

Most of the materials that make up a photovoltaic module can be recovered and reused at the end of life of modules, reducing significantly the amounts destined to become waste.

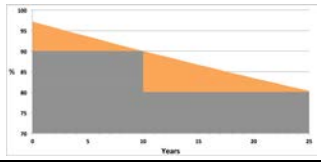
Solar Innova panels are within the regulatory requirements of toxicity based on Toxicity Characteristic Leaching Procedure (TCLP) testing and are not considered hazardous waste.

Solar Innova has obtained in its factory a multitude of distinctive quality independent standardization bodies and control, demonstrating continued compliance with high standards of safety and quality in their products.

Outstanding quality, reliability above average and superior performance distinguish the Innova Solar modules. For this to continue to keep well, the modules are regularly a series of thorough tests and trials not only in the R & D and factory quality, but also through independent certification institutes.

In Solar Innova, production efficiency and supreme quality contribute decisively to the high degree of international competitiveness.

Guarantee 12/25 Years



Manufacturing defects: 12 years

Performance:

Minimal Rated Power (%/Years)

90 % at 10 years,

80 % at 25 years.

Producing high-quality PV modules requires much precision in selecting all the materials individually. Our commitment to precision goes beyond manufacturing right through to delivering the products to our customers. We offer all the knowledge about our products to distributors, technicians and installers, with which we have close cooperation for long-term sustainable growth. All of our products are manufactured on our own production facilities and are subject to the highest quality standards. In our own laboratory we test modules to ensure compliance with all international standards and to ensure stable quality and performance of our products.

The strictest quality management is applied throughout the complete production sequence to a visual, micro-optical, mechanical, and electrical final inspection continuously insuring the premium quality of photovoltaic panels. Solar Innova guarantees you faultless module delivery and avoids drops in performance as a result of mechanical damage through proper module packaging. All modules are manufactured on our own production facilities at our headquarters and delivered from there to our worldwide subsidiaries. Solar Innova takes over the entire logistics to the end customer thus guaranteeing the traceability of the modules. We monitor the production process and flow of each module and ensuring the high quality of our modules.

Solar cells directly convert sunlight into direct current electrical energy and the generator are of the module. The quality of cells directly influences the characteristics of a solar module is therefore essential silicon composition used.
Solar Innova cells used exclusively highly efficient with minimal variations in the process of optimizing the production reproducibility of the separation of cells. Is a determining factor for the quality of the cell constant for stable profits. The high resistance multipliers and fill factors used cells provide a good source of energy radiation especially low.
Each cell is checked, and classified electrically calibrated prior to interconnection to optimize the behavior of the module.

Prismatic tempered glass with the following characteristics:
✔☐Microprism surface structure.
✔☐High transmissivity.
✔☐Low reflectivity.
✔☐Low iron.

Our PV modules are equipped with junction boxes for solar modules DIN V VDE V 0126-5 is used as an interface between the solar cells and photovoltaic system.
Our boxes are sealed and are ready for the elements with degree of protection IP67, which provides the insulation against moisture, inclement weather, dirt and ultraviolet radiation.
Inside are installed bypass diodes to protect the PV modules if they are under shade.

Our PV modules are equipped with connectors and sockets MC-T4 100 % compatible with the connectors and sockets used to connect electrical systems. Only MC-T4 connector or compatible and special solar cables may be used to lengthen the cables connected to the module. These must meet the electrical requirements of the interconnection design.

Solar Innova offers its products for maximum performance photovoltaic sure of a good quality product Over the course of their lifespan, of 25 years or more, photovoltaic modules are subjected to severe environmental conditions. Come hail, snow or heat, they need to continually deliver peak performance in order to achieve maximum profits. In order to achieve this, the use of high-quality components is crucial. At Solar Innova we only use the best materials and first-class, weatherproof components from certified suppliers and market leaders. At Solar Innova each delivered component is checked intensively, ensuring long life and high yields.

All Solar Innova modules are characterized by a positive tolerance of 0/+5 Wp of rated power, which guarantees high energy yield over the life, and resistance to the return current, which minimizes material needs Interconnection and time.
This quality standard is implemented by Solar Innova cell use grade "A" of high efficiency.

The ideal conditions for a photovoltaic system is blue sky and sunshine. Unfortunately for solar these are not the most common conditions. About two-thirds of the average annual radiation is in the range of weak light. Weak light describes the intensity of radiation that is considerably lower than 1000 W/m². Of course, a photovoltaic system produces electricity anyhow, however the current yield decreases. Solar Innova modules have superior weaklight performance with an above average efficiency, generating you extra yeild in these conditions.

Each solar cell loses performance when being exposed to the sun. Solar Innova modules are characterized by a very low degradation securing you a permanently stable yield. The use of high-quality raw materials ensures the low degradation of the nominal power of our modules, particularly at the beginning of the operating life. For this reason, we can offer a 25 year linear performance guarantee. In the first year, Solar Innova guarantees a performance of at least 97 % of the nominal power. In the following 24 years, Solar Innova guarantees a maximum performance reduction of 0.7 % of the nominal power per year. With this performance bond, Solar Innova guarantees quality and performance from its own production and provides you with security in your investment.

Our modules require no or very little maintenance due to its own configuration: no moving parts and cells and their internal connections are encapsulated in several layers of protective material.
You should make a general inspection 1 or 2 times a year to ensure that the connections between panels are tight and free of corrosion.
In most cases, the action of rain eliminates the need for cleaning of the modules, but if necessary, simply using water and a mild detergent.

An innovative and eco-friendly step in manufacturing has enabled Solar Innova ignore all the lead normally required in the welding process, which has significantly reduced the lead content in the module.
The result is an even more respectful of the environment with the same performance and reliability product.
All these features help our modules to achieve the environmental objectives for residential users, businesses and governments looking to reduce their carbon footprint and save on energy costs.
As part of the commitment of Solar Innova with the environment, we are not only making modules even more respectful of the environment, but we are also implementing best practices information integrating sustainability into our operations.

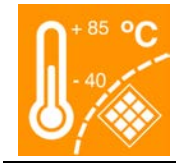
With a special electro-luminescence test, a type of X-ray, Solar Innova ensures 100 % cell quality. By examining all cells and finished laminates for any internal damage, micro-cracks, hot spots, soldering errors and other imperfections, which are not visible to the naked eye, are eliminated.

In photovoltaics, the hot-spot effect refers to an overheating of a specific area of a solar module which can result in a fire in extreme cases. Solar Innova executes a 100 % test of all cells by applying a reverse current. This specially developed and defined procedure, allows us to identify potentially defective hot-spot cells and reducing the risk of incidents occuring.

Conventional solar systems inherently have differences in voltage between the system framework and solar cells. These differences can lead to unwanted leakage currents which reduce the capacity of the cells and can cause a loss of yield of 20 % or more. This effect is called Potential-Induced Degradation (PID). The use of high-quality encapsulation materials and state-of-the-art plant technology at Solar Innova ensures a consistent production of PID-resistant modules.

Excessive snow pressure is actually one of the most important damage categories for photovoltaic systems, alongside storm damage and damage due to theft, overvoltage, hail or fire. The problem: Especially on sloping roofs, the snow load on photovoltaic systems is unevenly distributed. In fact, the snow slides down to the bottom part of the module frame, causing extreme loads on the modules and mounting parts here. The consequence: "This causes an increased occurrence of serious damage especially to the frame and glass surfaces of the modules – and not just in mountainous regions, but also in flat areas".

All our photovoltaic modules have been tested to meet Class C fire resistance and eligible for installation on roofs Class A, as determined by UL Standard 1703.



To eliminate premature fatigue and deformation of the material, our products are regularly tested to assess their weather resistance in wet and cold conditions and extreme temperature changes.
Solar Innova pv modules have been tested for resistance to different temperatures to test their endurance and proper operation in temperature ranges from -40 to +85º C.

Generating electricity using solar PV panels does not produce greenhouse gases directly. But emissions are associated with other parts of the panels life cycle: manufacturing and transporting them, for example.
The main components of solar PV panels are made from crystalline silicon. Manufacturing these components is an energy-intensive process that represents a high percentage of the total energy used to make solar panels. The exact carbon footprint of any particular solar panel depends on many factors, including the source of the materials, the distance they have to be transported and the energy source used by the manufacturing plants.
The carbon footprint of a solar photovoltaic (PV) panel (the average level of greenhouse gas emissions it is responsible for over its lifetime) is about 72 grams of carbon dioxide-equivalent per kilowatt-hour of electricity generated (gCO2e/kWh).
In Solar Innova we optimized all these concepts to minimize the carbon footprint of our products.

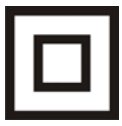
INTERNATIONAL CERTIFICATES

All our PV modules are produced in a environment ISO 9001, ISO 14001 and OHSAS 18001.





All our PV modules are designed, manufactured and approved for use in the environment of the European Union with the CE marking.


All our PV modules are designed and manufactured according to IEC/EN 61215 and meet the qualification standards of safety of photovoltaic modules IEC/EN 61730 Class A (Class II).




To meet these international standards have been used high quality materials and durability. Moreover Solar Innova has established a series of rigorous quality control at every stage of the production process and final inspection of the output of all manufactured modules.

RECYCLED

Solar Innova, continuing with its program of continuous improvement and efficiency in terms of Quality and Environment is involved in the recycling of photovoltaic modules.

Solar Innova and goes one step further in their awareness of environmental issues, giving your product a seal which makes it doubly green and providing customers a viable solution for those modules that have reached the end of its useful life.

The objective is the collection and recycling of photovoltaic modules at the end of its life installed in the EU and EFTA countries.

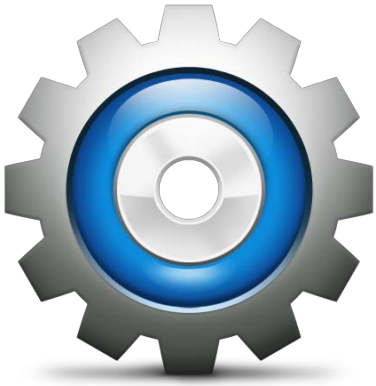
From Solar Innova is providing clean, renewable energy through the most powerful natural resource, the sun, but want to close the circle and give, through the recycling of modules, a clean out the final destination of its modules.

The photovoltaic modules contain materials that can be recovered and reused, either new PV modules or other new products. Recycling industrial processes exist for both thin film and silicon for modules. Materials such as glass, aluminum, and a variety of semiconductor materials, are valuable when recovered.

Solar Innova modules have a lifespan of 25 years, require minimal maintenance and are a low CO2 to the atmosphere together when the time comes for them to be discarded will be collected for recycling.

Recycling not only benefits the environment by reducing the volume of waste, but also helps reduce the amount of energy needed to provide raw materials and therefore the costs and environmental impacts of the production of photovoltaic modules.

SERVICES



Solar Innova is constituted by a team of highly qualified and specialized in renewable energy commitment to the implementation of clean energy to enable sustainable growth and a better future for all, not forgetting the fair return on its investors and customers.

The main advantage that report **Solar Innova** services comes from its professional and specialized management, which allows obtaining higher and safer returns, reducing risks, optimizing and streamlining processes and, above all, avoiding hassles and concerns to their clients. Have the same advantage, any company or person with a small investment, you will have access to investments in renewable energy, inexhaustible and clean.

Solar Innova, born with the firm purpose of contributing to a more sustainable future. Energy saving is the first way to combat the changes that are happening on our planet.

Alternative energy, now fully consolidated as a viable way to preserve the environment, is the only solution for eliminating pollution and CO2.

The world needs systems based on solar power with improved quality and efficiency. This is the definitive answer to a paradigm shift cleaner energy, sustainable and economically.

Besides thinking about how to produce clean energy, we must learn to make rational use of energy as a priority.

Full customer satisfaction is our commitment, and he devoted one hundred percent of our time and effort. We monitor daily performance and quality in products and services.

We have a rigorous internal quality control in order to offer the customer the best service.

DEALERS

We want to make sure your solar experience is fully satisfactory. This is why we have selected highly skilled dealers and installers around the world. Our Official Dealers and Installers will provide you with a professional installation job and a high-level customer service.

Consistent with our commitment of pushing forward existing quality requirements, we have drafted a Quality Charter for dealers and installers, that defines a series of rules aimed at guaranteeing the best quality of service to homeowners choosing Solar Innova products. Having signed our Quality Charter, Official Dealers and Installers prove to share the same vision of quality as us, and take responsibility for providing their clients with a better service.

Our Official Dealers and Installers have gone one step further, formalized by the signature of Solar Innova Letter of Commitment. Having your Solar Innova products installed by an Official Installer, you can enjoy the benefits of your home photovoltaic system with absolute peace of mind.

We want solar energy to be recognized as a prime choice for the generation of electricity and we believe the satisfaction of each and every of our customers is the best way to reach this goal.

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