

GENERAL SOLAR PV

Photovoltaic waterproofing systems

Waterproofing 

Sustainability 

Know-how 

Performance 



Stop the water,
catch the sun!

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Waterproofing

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General Solar PV is an innovative photovoltaic waterproofing system, guaranteed to last, and unique in terms of **durability, know-how, performance and sustainability.**

In line with its commitment to a green world, **General Membrane** offers a sustainable solution — **General Solar PV** — to those looking for a system that combines energy production from a renewable source with superior roof waterproofing design.

General Solar PV features a waterproofing system designed to the best industry standards, using special bituminous or synthetic membranes as the substrate for a specific type of lightweight and flexible photovoltaic module. In addition, the features of the system are such that it can be fully integrated into the roof structure and installed on buildings subject to landscape constraints.

How the design evolved

The **General Solar PV** photovoltaic waterproofing system was launched in **2007** in response to Italy's first PV incentive scheme, "**Conto Energia**".

With state funding available, the **General Solar PV** system has become firmly established as an innovative integrated photovoltaic solution, to the point of being included in the **Guide to innovative applications for BIPV drawn up by the government** owned company GSE.

The years since have seen the installation of more than **50 MWp** capacity, and in excess of **3,000,000 m²** of **Phoenix Solar** membranes, enabling production of more than **55 MWh/year**.

2007

GSPV Photovoltaic Panel
Solution with flexible thin film:
Amorphous Silicon technology



2017

GSPV FLEX Photovoltaic Panel:
Solution with flexible thin film: CIGS
technology



2022

GSPV MONO Arc Photovoltaic Panel: Solution with flexible thin film
Monocrystalline Silicon technology



Fig.1 Logistics Centre, Nola
Area: 590,000 m² - Power output: 20.252 MWp





Fig. 2 Salone degli Incanti, Trieste Area: 1.300 m² - Power output: 92 kWp

International climate agreements

Under the historic **Paris Agreement** signed in 2015, endorsed subsequently by the **United Nations** conference on climate change held in Glasgow from 31 October to 13 November 2021, the whole of the International Community in full makes a commitment to keep the rise in global temperature down to less than 2 °C, and if possible within 1.5 °C.

In line with the stated intentions of the International Community, the **European Union** has set out a program with the following aims:

Europe 2020 Agenda: this was the first EU strategy on climate and energy, which identified three targets to be met by 2020:

- **Reduce greenhouse gas emissions by 20%** (compared to 1990)
- **Increase consumption of renewable energy to 20% of total**
- **Increase energy efficiency by 20%**

These targets were achieved overall.

2010

New aims are set for the ten years from 2020 to 2030:

- **Reduce greenhouse gas emissions by 40%**
- **Increase consumption of renewable energy to 27% of total**

2014

The need to achieve **Carbon Neutrality by 2050** is formally confirmed: i.e. to balance the levels of carbon emitted and the levels of carbon absorbed, as stated in the European Green Deal.

2019

The need to achieve **Carbon Neutrality by 2050** is put into law, approved by the **European Parliament**.

The Commission proposes increased energy efficiency targets across the EU and makes them binding, with a view to **achieving an overall reduction of 36-39% in final and primary energy consumption by 2030**.

2020

General Solar PV: an integrated and sustainable solution, guaranteeing compliance with international climate agreements

The **General Solar PV** system, offered by **General Membrane**, is in keeping with agreements of the International Community on climate change and on the use of renewable energy.

The system is integrated perfectly with the laying surface, leaving the urban surroundings of the installation entirely unaffected. Given its ability to produce energy from a renewable source with minimal space requirements, also the **durability** assured by the product as a whole — PV and waterproofing functions alike — the **General Solar PV** system qualifies as a highly **sustainable** solution, in every respect.

In effect, the latest version of **General Solar PV** — Mono Arc — makes use of flexible photovoltaic modules affording **high efficiency** (19.15%), guaranteed against **manufacturing defects** (12 years) and in terms of minimum power output (at least 84.8% after 25 years). The waterproofing package carries a twenty year guarantee thanks to the use of products that are unique in terms of durability, installed to design specifications drawn up by General Membrane.

With its **General Solar PV** system, **General Membrane** aims to contribute to the diversification of energy sources, focusing on the photovoltaic option and deploying know-how acquired over many years to guarantee **durability** of the roof installation.

Advantages and benefits

Performance



1 — Lightweight



The module weighs **7.3 kg**, corresponding to **3.27 kg/m²** (without the substrate membrane), and accordingly, is ideal for renovations and repairs where roof structures are unable to support additional loads.

3 — Integrated photovoltaic system

BIPV

Being completely integrated onto the waterproofing of the roof, the system is suitable for installation on buildings subject to landscape constraints.

5 — Flexible



Flexibility allows adaptation of the **General Solar PV** system to any type of building, i.e. vaulted roof, industrial shed, and even to structures of more complex geometry.

7 — Walkability



The protective coating applied to the modules ensures that they are **walkable**, both during installation and when carrying out routine maintenance on the panels once in service.

9 — Fire certification



The **General Solar PV** system responds to the requirements of fire resistance according to the **Broof** standards.

11 — Warranty



General Solar PV offers the following warranties:

- **12 years** on defects of manufacture (PV panel)
- Guaranteed minimum electrical power output (**at least 84.8% after 25 years**)

2 — No holes, frame or ballast on the roof



The **General Solar PV** system uses a non-penetrating, adhesive method of installation: no holes, no ballasts. With no frame components, there is no overloading of the roof structure and no stress induced by wind uplift (sail effect).

4 — No Glass



The **General Solar PV** module contains no glass and is therefore less sensitive to shocks. In addition, the opaque surface coating ensures anti-reflective behaviour.

6 — Resistant to hail



The system has passed the **hail resistance test** without any sign of functional damage or impairment of performance in terms of power output (IEC 61215).

8 — Self-cleaning



The special surface coating adopted for the product is such that the PV module will be kept generally clean by the normal run-off of rainwater.

10 — Speed of installation



General Solar PV system ensure a quick installation and therefore a **greater quantity of kWp** can be installed per unit of time compared to the traditional system.



Increased durability and sustainability of buildings



Fig. 3 General Solar PV on single ply Membrane
Area: 3.500 m² - Power: 50 kWp

Know-how 

General Membrane technical department design the build-up system, taking in consideration the specific thermal insulation needs connected with energy efficiency as required by current regulations.

Photovoltaic waterproofing system with bituminous membrane

General Solar PV is bonded to a bituminous substrate for renovations, and existing or new roof installations. The waterproof system includes the **Phoenix Solar – 35 °C membrane**, and is secured to the roof by mechanical fixing of the intermediate layers, fully bonded, thereby guaranteeing high resistance to wind uplift over time.

The photovoltaic panels that completes the package is bonded to the waterproofing layer to ensure watertightness of the system.

- | | |
|--|--|
| ① General Rapid Primer | ⑤ Phoenix Solar Tech – 35°C |
| ② Isolink Vapor 4,5 kg | ⑥ GSPV Mono Arc Module |
| ③ Thermal insulation Panel * | ⑦ Phoenix Super - 35°C 5,4 kg Mineral Reflect Protection |
| ④ Phoenix Super - 35°C + Mechanical fixing | |

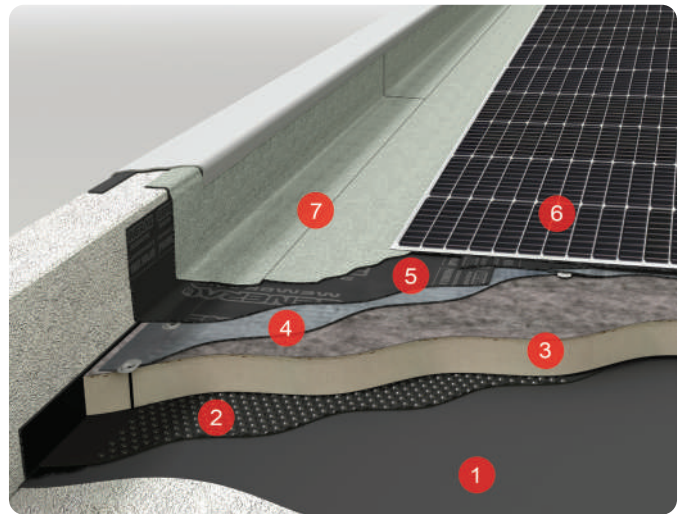


Fig.4 Build-up configuration of General Solar PV with bituminous membrane

Photovoltaic waterproofing system with single ply membrane

The **General Solar PV SH system** is applied both to new roof and existing roof installations using a single ply substrate (**TPO or PVC**). The photovoltaic panel is anchored to the waterproofing surface through **Velcro type hook-and-loop technology**, guaranteeing that the module remains firmly attached to the surface, and there are no holes or ballasts that could affect watertightness.

- | | |
|---|------------------------|
| ① General Rapid Primer | ④ TPO/PVC single ply |
| ② Isolink Vapor 4,5 kg | ⑤ Hook + Loop System |
| ③ Thermal insulation Panel *+ Mechanical fixing | ⑥ Mono Arc GSPV Module |

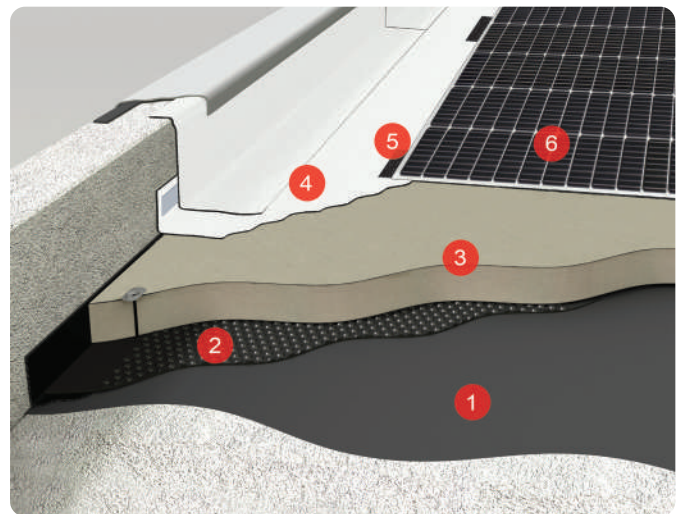


Fig. 5 Build-up configuration of General Solar PV SH with single ply membrane

* Thermal insulation panel suitable for the photovoltaic waterproofing system. The nature and thickness of the material must match the requirements indicated in regulations concerning energy efficiency.

Our Technical Department will provide assistance at all stages in the design, application and maintenance of waterproofing systems.

For comprehensive information on design and custom specifications
— tecnico@generalmembrane.com

Stop the water, catch the sun! 





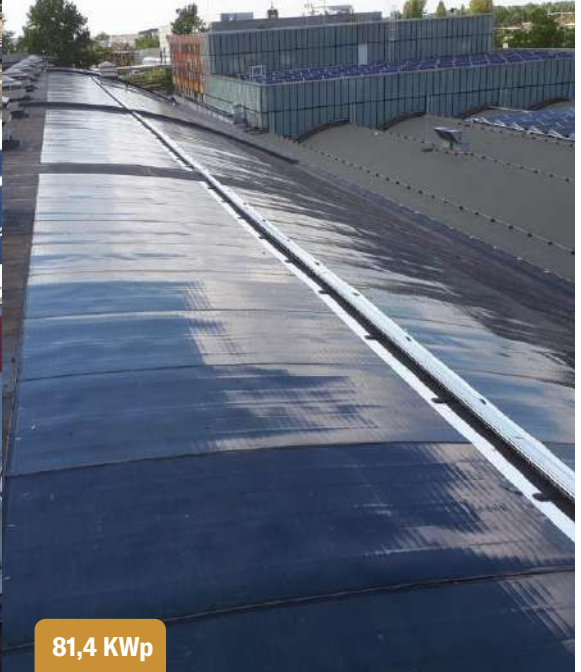
7 KWp



60 KWp



47 KWp



81,4 KWp



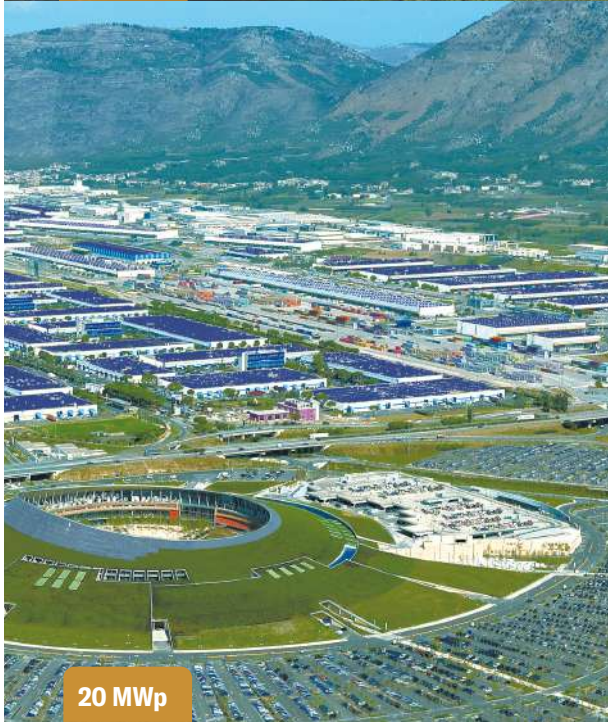
99 KWp



580 KWp



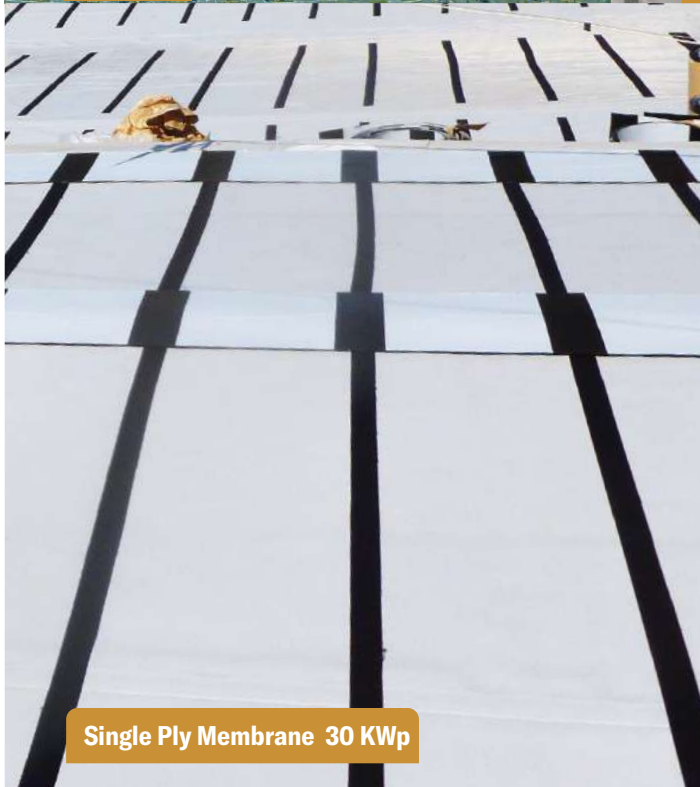
92 KWp



20 MWp



Single Ply Membrane 9 KWp



Single Ply Membrane 30 KWp



Single Ply Membrane 50 KWp



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