

ClimateCoating®

Reflective Membrane Technology



PV-SolarPlus

Reflective roof coating to maximize solar panel performance and extend lifespan



GERMAN
**INNO
VATION
AWARD '18**
WINNER

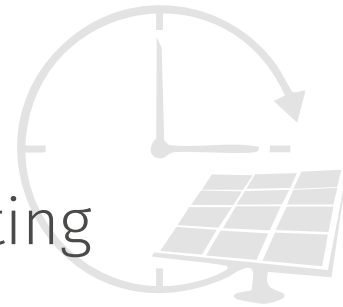


GERMAN
**INNO
VATION
AWARD '24**



Reflective Membrane
Technology

PV-SolarPlus – the PV efficiency-enhancing roof coating



PV-SolarPlus significantly reduces the thermal heat build-up of roof surfaces and photovoltaic systems, creating optimal conditions for maximum energy yield. By noticeably lowering roof and module temperatures, solar panels operate more efficiently-especially during hot summer periods and under intense solar radiation. At the same time, thermal peak loads are reduced, relieving stress on the entire roof structure and minimizing temperature-related strain on the PV modules. This can enhance long-term operational reliability, slow down aging processes, and extend the service life of both the photovoltaic system and the roof structure.

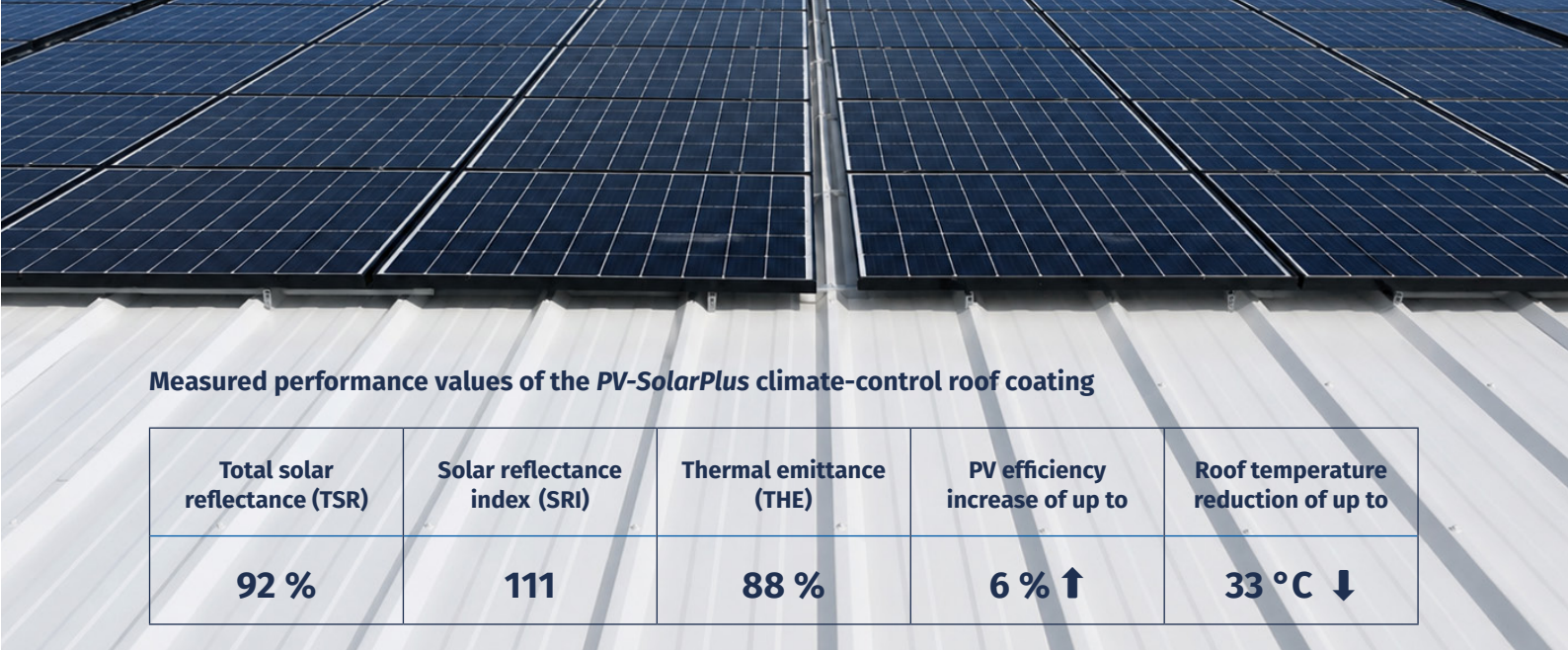
PV-SolarPlus improves photovoltaic performance, reduces thermally induced aging, and helps extend the service life of both solar installations and roof structures.



More performance, more reliability, more return on PV Investment

- Reduces module temperatures by up to 10°C and roof temperatures by up to 33°C
- Increases PV module output by up to 6%
- Reduces temperature-related performance losses on hot days
- Slows module aging and helps extend the service life of photovoltaic systems
- Lowers thermal stress and reduces the risk of failures
- Shortens the payback period and increases overall return on investment (ROI)





Measured performance values of the *PV-SolarPlus* climate-control roof coating

Total solar reflectance (TSR)	Solar reflectance index (SRI)	Thermal emittance (THE)	PV efficiency increase of up to	Roof temperature reduction of up to
92 %	111	88 %	6 % ↑	33 °C ↓

The problem of roof overheating

More yield starts on the roof

In summer, roof surfaces can heat up to over 70 °c. This extreme thermal load measurably reduces the performance of photovoltaic systems installed on the roof: with each additional degree celsius, pv module efficiency drops by approximately 0.4–0.5%.

This effect is further amplified in densely built urban areas by the urban heat island effect. Compared to surrounding rural regions, cities often experience temperatures that are up to 10 °c higher. This is caused, among other factors, by extensive surface sealing, the heat storage capacity of building materials, low levels of evapotranspiration, and additional heat emissions from traffic, industry, and building operations.

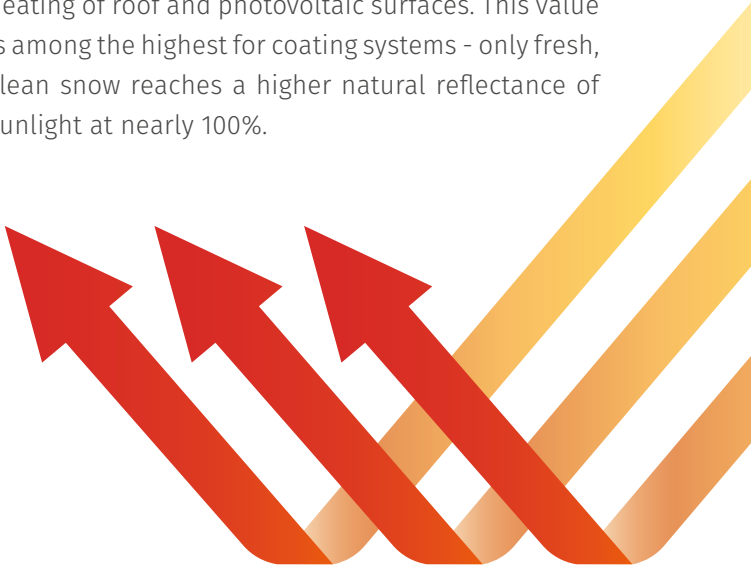
The combination of overheated roof surfaces and an urban microclimate places additional thermal stress on buildings and pv systems. As a result, not only is energy yield reduced, but cooling demand and overall energy consumption also increase. In addition, thermally induced aging of pv modules and building materials is accelerated.

Against this background, technologies that reduce solar heat absorption on roof surfaces, improve the performance stability of pv systems, and simultaneously contribute to lowering urban energy demand are becoming increasingly important.

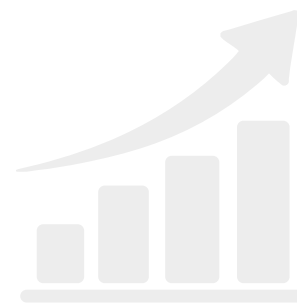
Maximum reflectance as a key solution approach

This is exactly where the *PV-SolarPlus* coating comes in: The highly reflective roof coating, specifically developed for PV roof systems, significantly reduces roof and module temperatures. This enables more stable and higher power generation under high irradiance conditions while also reducing the thermal load on the building.

A central element of the solution concept is the minimization of solar energy absorption through maximum reflection of incoming solar radiation as well as high emission within the atmospheric window. The innovative *PV-SolarPlus* coating by *ClimateCoating®*, based on reflective membrane technology, achieves a solar reflectance of up to 92% and thereby significantly reduces the thermal heating of roof and photovoltaic surfaces. This value is among the highest for coating systems - only fresh, clean snow reaches a higher natural reflectance of sunlight at nearly 100%.



Higher energy yields in monofacial and bifacial PV systems



Maximum PV efficiency through highest reflectance

The performance of PV modules is directly dependent on their operating temperature. Rising temperatures lead to reduced efficiency and therefore to energy yield losses. The high reflectance performance of *PV-SolarPlus* significantly reduces the heating of the roof surface. As a result, PV modules remain within a more favorable temperature range even under intense solar irradiation and can deliver their output more consistently and efficiently.

Possible temperature and performance impact of *PV-SolarPlus*:

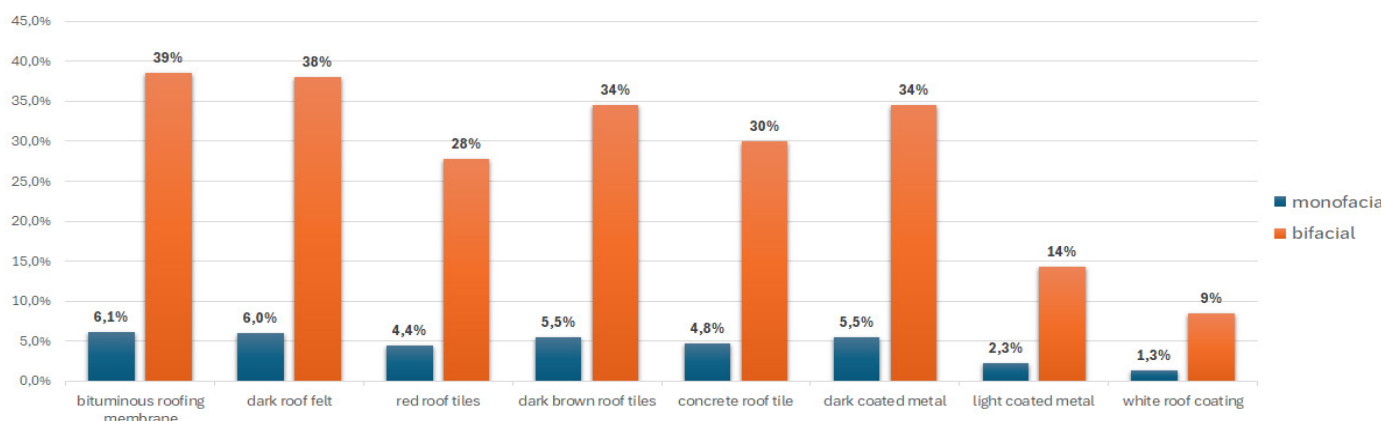
Temperature reduction of	PV module performance increase	Additional annual yield (100 kwp system)	Financial impact (approx.)
up to 10 °C	approx. +4 %	+4.000 kWh	+1.000 €
up to 15 °C	approx. +6 %	+6.000 kWh	+1.500 €
up to 20 °C	approx. +8 %	+8.000 kWh	+2.000 €

Solar modules are the central component of every photovoltaic system, and the choice of the appropriate module type has a decisive impact on energy yield. In general, a distinction is made between monofacial and bifacial solar modules.

Monofacial PV modules: use only the direct solar irradiation on their front side. The primary focus here is thermal relief: by reducing the heating of the roof surface, lower module temperatures are achieved, which in turn reduces temperature-related performance losses. Depending on roof construction and local conditions, monofacial PV systems using *PV-SolarPlus* can achieve additional yields of up to 6% under optimal site conditions.

Bifacial PV modules: absorb sunlight from both sides and additionally utilize reflected ambient light (albedo). In addition to thermal relief, the high solar reflectance of the roof coating plays a decisive role. The highly reflective surface of *PV-SolarPlus* directs more diffuse and reflected light onto the rear side of the modules. As a result, bifacial systems with a *PV-SolarPlus* roof coating can achieve additional yield gains of up to 39%.

Calculated PV efficiency of monofacial and bifacial modules after coating with *PV-SolarPlus*

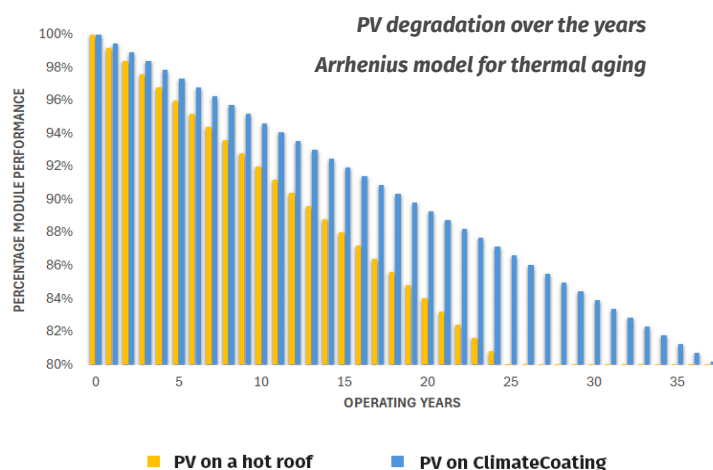


Approximately 90% of solar modules produced worldwide today are already manufactured as bifacial modules.

Extended service life of PV modules

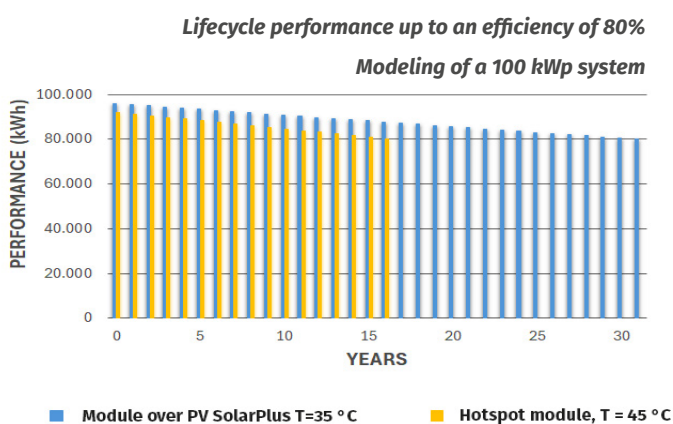
Efficient protection against thermal aging

High temperatures accelerate the aging of PV modules and negatively affect their long-term performance. Model-based analyses of temperature-dependent aging processes show that lowering the operating temperature by 10 °C can significantly slow down module degradation. As a result, the point at which the modules reach only 80% of their performance is delayed by many years to decades. This means that performance and energy yield remain more stable over the long term, and depending on system design and operating conditions, additional annual energy yields of 2 to 39% can be achieved.



Maximized energy yield over the lifetime

Due to reduced thermal stress, PV systems remain more efficient and operationally reliable over the long term. This has a positive impact on the cumulative energy yield and the overall economic performance of the system. Model-based analyses show that this can result in up to twice as high cumulative energy production over the entire lifetime.



The result: sustainable economic viability

Higher annual yields, reduced degradation, and an extended service life sustainably improve the overall economic performance of the system. This leads to lower levelized cost of electricity (LCOE), more stable returns, and a significantly increased overall return over a service life of 15 to 30 years. In many project scenarios, the investment pays for itself within just three to five years.



PV-SolarPlus optimizes the performance of PV systems and ensures higher yields while also extending module lifespan.

Areas of application, properties and processing



The reflective roof coating with excellent cooling performance:

- reflects up to 92% of solar radiation
- reduces module temperatures by up to 10 °C and roof temperatures by up to 33 °C
- increases PV yield by approx. 2–39% (study)
- significantly extends the service life of roof structures and PV systems
- reduces operating and maintenance costs
- lowers the building's cooling energy demand



PROPERTIES

- sunlight reflecting
- high and durable UV-resistance
- weather-resistant
- elastic
- gab/joint bridging
- high resistance against acids, alkalis, ozone, nitrogen and sulfur oxides



COLOUR TONE

- white and 100.000 colors
- high colour stability

PROCESSING

- rolling, brushing, spraying
- recommendation: *FixPlus* for regulating substrate absorbency, *GlossPlus* for easier cleaning



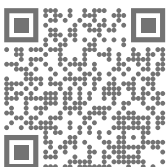
PACKAGING UNITS

- 5,0 / 12,5 / 19,0 l
- Consumption: 600 ml/m² on smooth, not highly absorbent surfaces with 2 applications
- with additional fiber embedding up to 1,000 ml/m² with 2-fold application
- suitable for almost all roof substrates: bitumen, metal, concrete, tiles, plastic (minimum roof pitch: 3%)



ENVIRONMENTALLY FRIENDLY

- lower energy consumption for cooling and therefore
- reduced CO₂ emissions means an active contribution to climate protection



PV-SolarPlus – reflective roof coating that improves PV efficiency under strong sunlight. We are happy to answer your questions about the product.

www.climatecoating.com/en/produkt/pv-solarplus



Start your pilot project and experience the effectiveness of *PV-SolarPlus* in ...



commercial buildings,



logistics centers,



residential real estate,



and municipal buildings.

Reflective Membrane Technology

At the core of the reflective membrane technology are specially developed glass-ceramic hollow spheres that enclose a vacuum. In combination with a highly adhesive special dispersion and carefully balanced activators, a reflective membrane with unique properties is formed after application.

The technology combines high solar reflectance, thermal stability, controlled moisture regulation, anti-static properties, and high material durability. These exceptional properties are combined in the roof coating *PV-SolarPlus* as well as other products of the *ClimateCoating®* brand.

Technology for long-lasting roof and PV systems

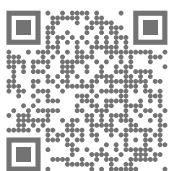
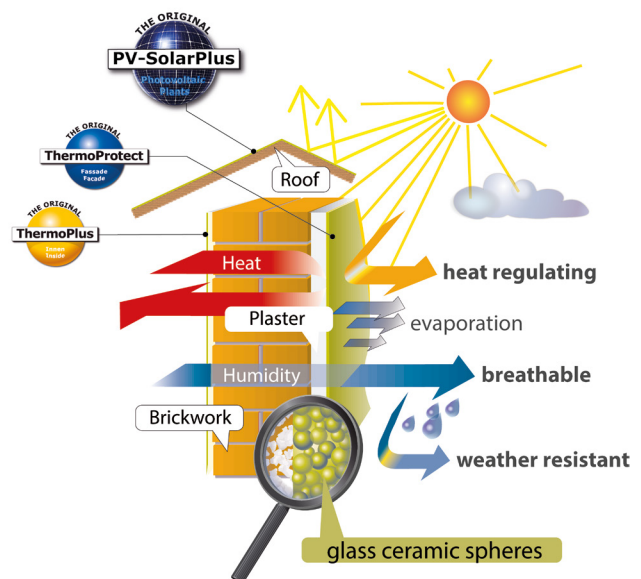
The reflective roof coating *PV-SolarPlus* was specifically developed for use on roof surfaces with photovoltaic systems. The reflective membrane reduces the solar energy absorption of the roof surface, thereby ensuring a more balanced thermal behavior of the entire roof structure.

In addition to improving energy performance, the coating reduces material-related stresses within the roofing system. Temperature-induced load cycles are minimized, and the roof surface is protected in the long term. In this way, *PV-SolarPlus* supports long-term functionality and value retention.

PV-SolarPlus carries the GREENGUARD Gold certification, meeting one of the world's most stringent standards for chemical emissions.

In addition, *PV-SolarPlus* complies with ANSI/CRRC S100 requirements and the Cool Roof Rating Council (CRRC) Program Manual. The company has also been recognized for its technology with the German Innovation Award in 2018 and 2024, as well as the Singapore Energy Efficiency Award 2018.

**Reflective Membrane Technology –
Physical principle of action inside / outside**



Discover our additional solutions for your project – suitable for every surface. Learn more about the innovative technology behind our functional coatings and how sustainable coating systems are setting new standards in efficiency and functionality.

www.climatecoating.com/en/products

Efficient surfaces for high PV yields even ...



on flat roofs with high thermal stress



bifacial module systems



existing buildings with installed PV systems



new construction projects focused on energy efficiency

Looking for a brush-applied solution for your roof with PV modules? Get in touch with us. We are happy to share our global practical experience.

info@sicc.de

Your authorized dealer:

ClimateCoating® – Intelligent coatings and plasters with added value.
For buildings, interiors and industrial applications.
Environmentally friendly. Powerful. Effective.

Made in Germany. Made for you.

SICC Coatings GmbH from Berlin is the leading specialist supplier of climate-active coatings with the longest experience in all climate zones and application areas. The functional coatings are based on the reflective membrane technology. For the energy-saving effect of the technology, SICC Coatings was awarded the „German Innovation Award“ in 2018 as well as with the „Energy Efficiency Award“ in Singapore, among others. SICC Coatings is certified in quality and environmental management according to DIN EN ISO 9001:2015 and 14001:2015.

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