

GREEN ROOFS &
PHOTOVOLTAICS
OPTIGRÜN-SOLAR



SUSTAINABLE URBAN DEVELOPMENT THROUGH THE MULTIFUNCTIONAL USE OF ROOFS

THE POSITIVE EFFECTS OF SOLAR GREEN ROOFS ON OUR WELL-BEING AND THE ENVIRONMENT

PHOTOVOLTAICS

Sustainable power generation with solar energy.

RAINWATER RETENTION

Flood protection and relief of the sewerage system -
preservation of the natural water balance.

ECOLOGICAL EQUALISATION

Green areas provide habitats instead of dead sealed surfaces.

FINE DUST AND NOISE CONTROL

Improving quality of life and active health protection.

CLIMATE IMPROVEMENT

The evaporation capacity of the green roof cools the ambient temperature.

PROTECTION AT EXTREME TEMPERATURES

Green roofs protect the roof waterproofing from the effects of weather and extreme temperatures. This increases investment security and reduces the risk of follow-up costs and repairs.

Densely built-up and hard landscaped urban centres face considerable challenges. Urban heat islands, heavy rainfall and flooding cause health problems for residents and considerable damage to property. In addition, cities are particularly affected by the effects of climate change.

A wide range of adaptation measures are required to improve the urban climate and create liveable cities. Due to the limited space available, it is necessary to utilise the existing roof areas and design them to be multifunctional.

SOLAR GREEN AREAS are an effective response to the numerous challenges.

The advantages of both electricity production and roof greening are undisputed. The two technologies do not necessarily compete with each other – quite the opposite.

Photovoltaic systems on roofs are an important component in the expansion of renewable energies. Generating electricity is also financially advantageous for many building owners and investors. In addition, a green roof can contribute to solving the heat problem and to flood protection through the forward-looking use of rainwater.

The urban environment also benefits from further advantages of vegetated roofs in the form of fine dust and noise reduction as well as a significant increase in biodiversity.



ECOLOGICALLY AND ECONOMICALLY VIABLE THE POSITIVE EFFECTS OF SOLAR GREEN ROOFS ON THE FUNCTIONALITY OF BUILDINGS

Green roofs have numerous positive effects. They increase the energy, economic and ecological functionality of buildings. In addition, green roofs are also effective systems for rainwater management and improving the urban climate.

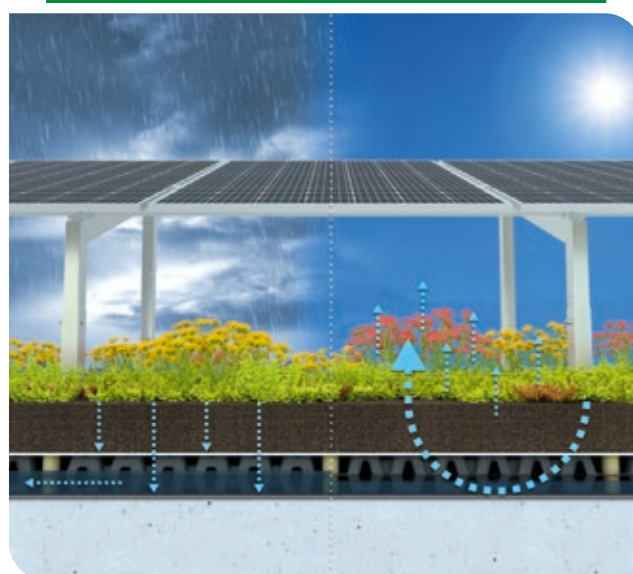
Solutions with plenty of space for rainwater retention, low runoff and a high evaporation capacity are particularly advantageous.

Green roofs make a decisive contribution to restoring the natural water balance in urban areas. The environment is cooled by a high level of evaporation of the precipitation.

The overall low surface runoff is an important component of flood protection. This solution can also be used to fulfil discharge restrictions into the public drainage facilities.

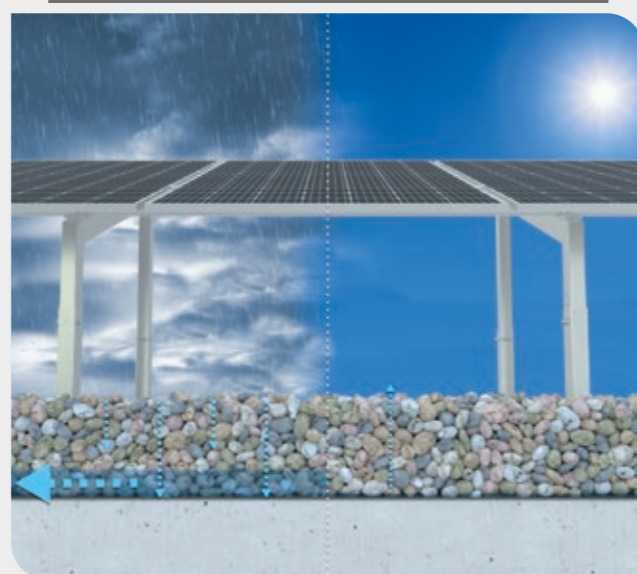


SOLAR GREEN ROOF



- › High water retention
- › High evaporation performance & cooling
- › Minimised surface runoff
- › Ecological balance

SOLAR ROOF WITHOUT VEGETATION



- › Low water retention
- › Hardly any evaporation capacity
- › No cooling effect
- › High and rapid surface runoff

The combination with a green roof, especially with sufficient water availability and high evaporation capacity, can lead to an increase in the efficiency of the photovoltaic system due to lower surface temperatures. In addition, fine dust is bound in the vegetation, which has a positive effect on the energy yield by keeping the modules clean.

With a solar green roof, the module supports can be integrated into the green roof. The position and wind suction protection of the photovoltaic system is provided by the weight of the substrate. Preventing penetrations and point loads increases the service life of the roof waterproofing.

The connection also has a positive effect on the biodiversity of flora and fauna. The photovoltaic system ensures that several vegetation areas can develop on one roof. Varying levels of solar radiation and amounts of water in front of, under and between the modules provide a habitat for different plant and animal species.

The increase in efficiency of the PV system due to the cooling capacity and fine dust binding of the green roof, the structural advantages of the load-bearing system and the positive effect on biodiversity far exceed the advantages of the individual systems.

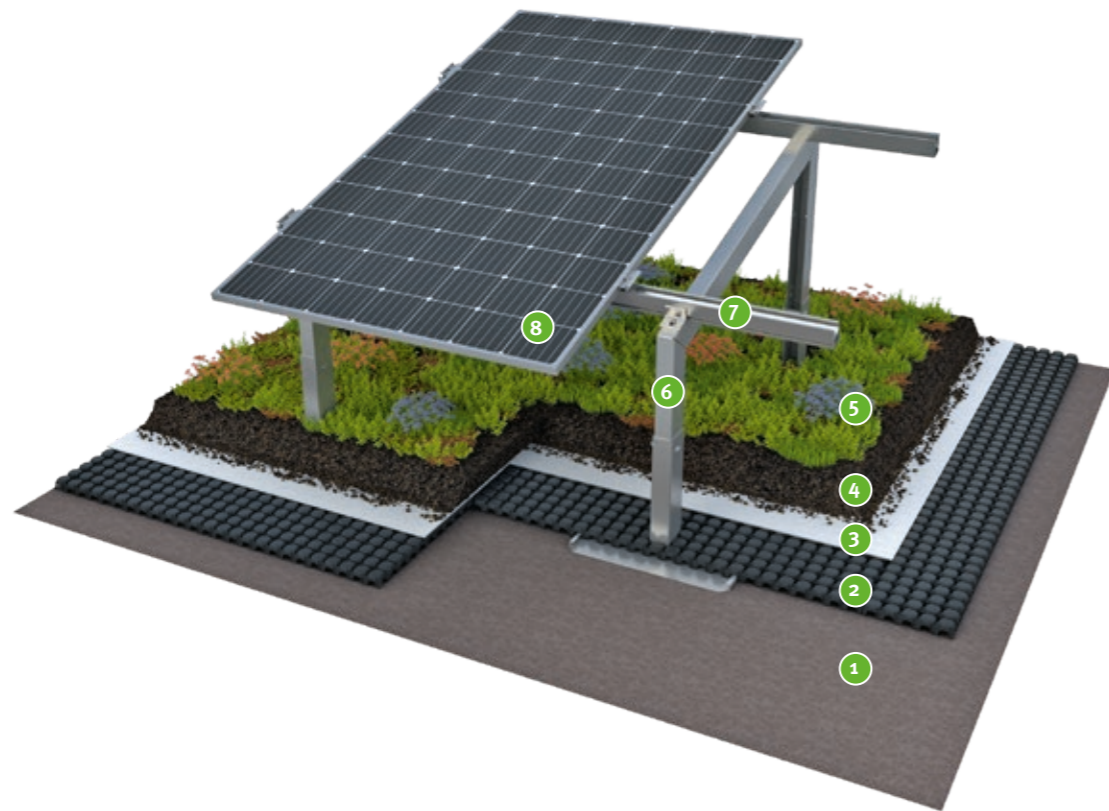
Premium service – the comprehensive calculation services from Optigrün



An optimised installation plan ensures that the SOLAR GREEN ROOF can be implemented cost-effectively and with minimal use of materials and time. A verifiable proof of stability for the entire system in accordance with Eurocode 1 and 9 is created based on a wind assessment

Service requests: solar@optigruen.de

OPTIGRÜN-SOLAR FKD



1 Separation, protection and storage fleece RMS 500
Protects the roof waterproofing from damage and stores water

2 Drainage and water storage element FKD 25
With large water reservoir and optimised water distribution

3 Filter fleece FIL 150
Prevents fine particles from being washed into the drainage layer while maintaining high water permeability

4 Extensive substrate
Substrate adapted to extensive construction methods

5 Sedum sprouts
Sedum sprouts as specified

6 Solar mounting Solar FKD
Load-supported solar mounting, consisting of base plate and bracket with associated module quickmounting rails and module clamps

7 Photovoltaic module
as specified



Do you want to know the technical details? On our website you will find a detailed consultation document, installation and laying instructions and lots of other technical information:



THE CLASSIC AMONG THE SOLAR GREEN ROOFS

Impressions from the field



“I’m delighted with the system. We build a lot of green roofs with PV systems and the Optigrün product saves us a lot of time and money during installation. The individual parts are a practical size and are easy to put together and fix. The solar green roof also looks great.”

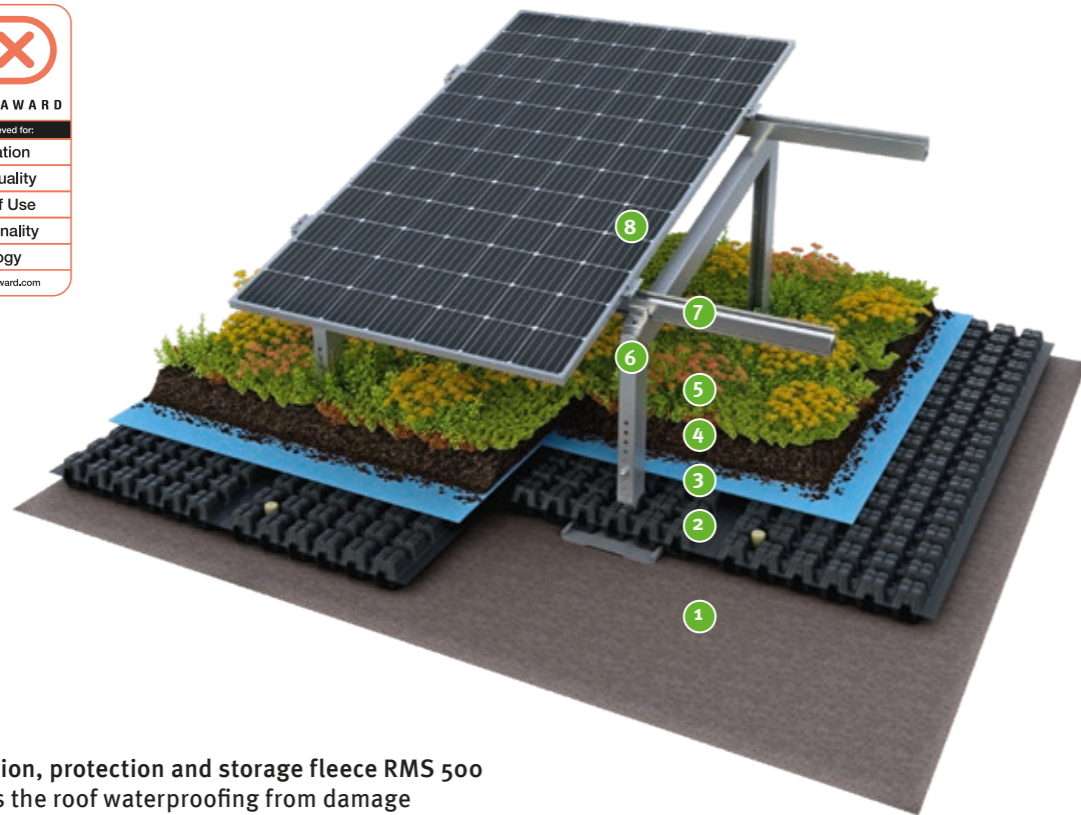
*Waldemar Weiß
Optigrün partner company Christian Lang & Waldemar Weiß,
Ehrenkirchen*

The most important facts in brief



- › Solar elevation in combination with
- › the tried and tested technology of the Optigrün Spardach
- › High-quality and compact components with low weight
- › Quick and easy installation in just a few steps
- › Optimised planning for minimum
- › Use of resources through the use of specialised software
- › Module inclination: 10°, 15° or 20°
- › Row orientation: south or eastwest
- › Module orientation: Either portrait or landscape
- › System weight: from 110 kg/m² or from 1.1 kN/m²

OPTIGRÜN-SOLAR WRB



1 Separation, protection and storage fleece RMS 500
Protects the roof waterproofing from damage and stores water

2 Water retention box WRB 80F
Cavity volume for retention, adapted to overlying vegetation, low weight, high water storage volume with capillary columns

3 Filter and capillary fleece FIL 200K
Optimum water distribution under the substrate layer

4 Extensive substrate
Substrate adapted to extensive construction methods

5 Sedum sprouts
Sedum sprouts as specified

6 Solar mounting Solar WRB
Load-supported solar mounting, consisting of base plate and bracket with associated quick-mounting module rails and module clamps.

8 Photovoltaic module as specified

Outlet restrictor (not included in illustration)
Accumulation regulator with defined perforations, which drains the water with a time delay



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PHOTOVOLTAICS & RAINWATER MANAGEMENT

Impressions from the field



A truly multifunctional solar green roof was installed on the roof of the Wi-Wash car wash in Ochtrup.

With Optigrün-Solar WRB, the solar mounting was combined with a retention roof discharge delay outlet restrictor.

The use of the WRB 80F water retention box creates a large cavity volume on the roof in which large quantities of precipitation can be retained.

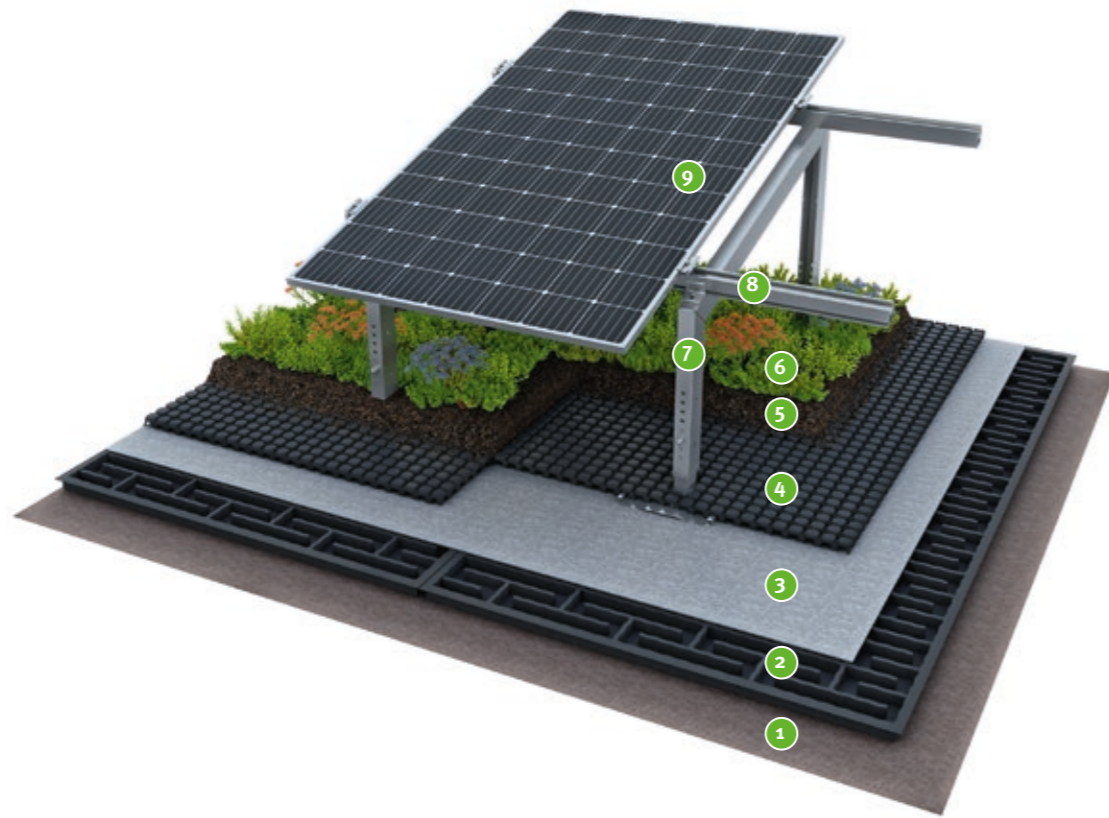
The electricity generated by the PV system can be stored on site by six batteries so that it can be used when needed or fed into the power grid. For example, the temporarily stored electricity can be used by customers at the e-charging station.

The most important facts in brief



- › Solar mounting in combination with the Optigrün retention roof Discharge restrictor on roofs with no slope (0°)
- › Unique combination of retention roof and solar PV generation
- › Compliance with discharge restrictions and flood protection
- › Increased evaporation capacity due to capillary columns and high water availability
- › High-quality and compact components with low weight
- › Quick and easy installation in just a few steps
- › Optimised planning for minimal use of resources through the use of special software
- › Module inclination: 10°, 15° or 20°
- › Row orientation: south or east-west
- › Module orientation: Either portrait or landscape
- › System weight: from 120 kg/m² or from 1.2 kN/m²

OPTIGRÜN-SOLAR FKM



- 1 **Separation, protection and storage fleece RMS 300**
Protects the roof waterproofing from damage and stores water
- 2 **Meander Water Retention Board FKM 30**
Lighter build-up with better drainage performance, delays discharge of surplus water, Prevents accumulation of water
- 3 **Filter fleece FIL 150**
Prevents fine particles from being washed into the drainage layer while maintaining high water permeability
- 4 **Drainage and water storage element FKD 25**
With large water reservoir and optimised water distribution
- 5 **Extensive substrate**
Substrate adapted to extensive construction methodst
- 6 **Sedum sprouts**
Sedum sprouts as specified

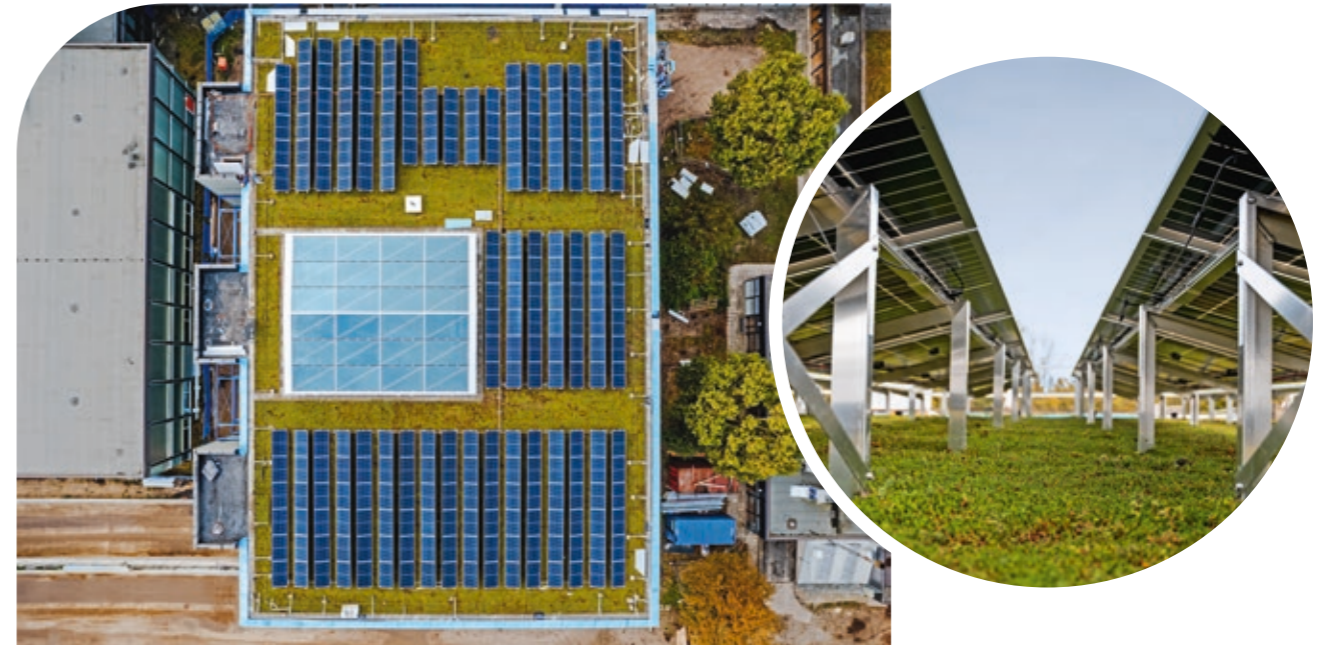
- 7 **Solar mounting Solar FKD**
Load-supported solar mounting, consisting of base plate and bracket with associated module quickmounting rails and module clamps
- 8 **Solar mounting Solar FKD**
Load-supported solar mounting, consisting of base plate and bracket with associated module quickmounting rails and module clamps
- 9 **Photovoltaic module**
as specified



Do you want to know the technical details? On our website you will find a detailed consultation document, assembly and installation instructions and lots of other technical information:



THE ECONOMICAL AND EFFICIENT SYSTEM FOR RUNOFF RETENTION AND SUSTAINABLE POWER GENERATION WITH SOLAR ENERGY



The Optigrün-Solar FKM roof greening system is a load-bearing elevation for the roof-penetration-free mounting of PV modules or PV module rows. The versatile substructure makes it possible to mount almost all PV modules with inclinations of 10°, 15° or 20°.

The module rows can be laid in a south or east-west orientation. The modules can be mounted both vertically (portrait) and horizontally (landscape). Optigrün-Solar FKM is the system solution for extensive solar green roofs where a very low peak runoff coefficient is required:

Thanks to the Meander FKM 30 drainage element, the rainwater has to cover a longer flow path and is also throttled at the outlet. This ensures a significant reduction in the peak discharge coefficient.

With the combination of load-bearing elevation and Meander FKM 30 drainage elements, Optigrün-Solar FKM is an economical and efficient system for runoff retention and sustainable power generation with solar energy.

The most important facts in brief



- > Solar elevation in combination with the Optigrün retention roof meander FKM 30
- > Economical and efficient system for runoff retention and sustainable power generation with solar energy
- > Module inclination: 10°, 15° or 20°
- > Row orientation: south or eastwest
- > Module orientation: Either portrait or landscape
- > System weight: from 115 kg/m²

OPTIGRÜN-SOLAR TOP



- 1 Extensive green roof
- 2 Optigrün-Solar TOP base
- 3 Optigrün-Solar TOP basic set
Consisting of ground rail, supports,
clamping brackets
- 4 Ballasting
- 5 Optigrün-Solar TOP module clamps
- 6 Photovoltaic module



Do you want to know the technical details? On our website you will find a detailed consultation document, installation and laying instructions and lots of other technical information:



THE RETROFIT SYSTEM SOLUTION FOR PHOTOVOLTAICS ON GREEN ROOFS

With Optigrün-Solar TOP, the combination of photovoltaics and green roofing is reimagined – as a system suitable for retrofitting on existing green roofs.

The solution enables efficient electricity generation without impairing the ecological functions of the green roof. Maintenance routes and access paths remain unobstructed, while the vegetation is left undisturbed, ensuring maximum yield with minimal effort.

Many building plans require a certain level of green roof coverage as a condition for obtaining planning permission. Optigrün-Solar TOP minimises the impact on green areas, as the ballast does not cover vegetation.

The load-bearing substructure and modular design allow quick installation thanks to a high degree of pre-assembly, keeping disruptions to ongoing building operations minimal.



Ballasting is carried out using standard construction materials such as paving stones.

Optigrün-Solar TOP represents seamless system integration without compromise: An ecologically effective green roof remains fully preserved – including biodiversity, evaporation capacity, and accessibility for maintenance.

At the same time, investors benefit from high planning reliability, as Optigrün provides traceable structural safety verifications and detailed installation plans upon request. Ideal for future-ready buildings where ecological roof space becomes a valuable energy source – sustainable, efficient, and suitable for retrofitting.

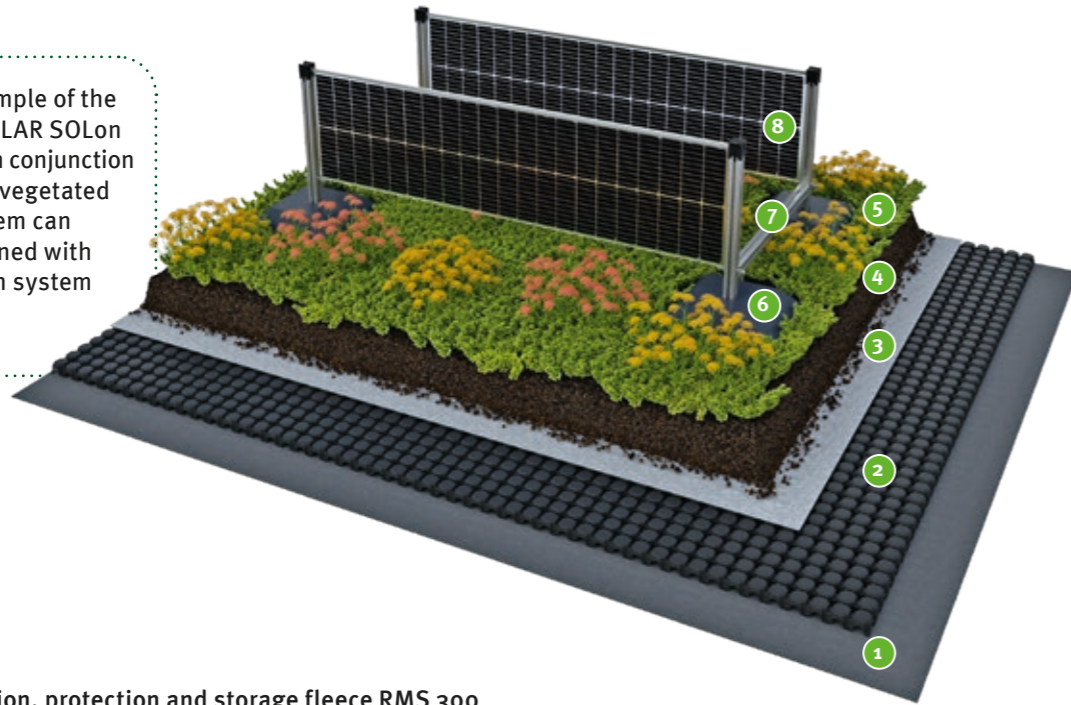
Key Benefits at a Glance



- > Retrofittable system for existing green roofs
- > Cost-effective green roof maintenance facilitated by maintenance paths (for both high and low points)
- > Excellent economic performance
- > Vegetation remains fully intact
- > Meets coverage requirements for permits and subsidies
- > Increased module efficiency due to the cooling effect
- > Modular design – quick and easy installation due to high pre-assembly level
- > No roof membrane penetration – load-bearing construction
- > Optional cable trays and ballast profiles
- > 10° module inclination
- > East-west orientation
- > System weight starting from 15 kg/m² including module

OPTIGRÜN-SOLAR SOLon

This is an example of the OPTIGRÜN-SOLAR SOLon system used in conjunction with a sedum-vegetated roof. The system can also be combined with other Optigrün system solutions.



1 Separation, protection and storage fleece RMS 300
300 Protects the roof waterproofing from damage and stores water

2 Drainage and water storage element FKD 25
With large water reservoir and optimised water distribution

3 Filter fleece FIL 105
Prevents fine particles from being washed into the drainage layer while maintaining high water permeability

4 Extensive substrate
Substrate adapted to extensive construction methods

5 Sedum sprouts
Sedum sprouts as specified

6 Ballast foot

7 Mounting frame

8 Bifacial photovoltaic module



Want to know the technical details? On our website you will find an assembly and installation video, a product data sheet and lots of other technical information:



IDEAL FOR ALREADY EXISTING GREEN ROOFS

Impressions from the field



OPTIGRÜN-SOLAR SOLon is the result of extensive research, including wind tunnel tests. The system can be installed in a secure position with low loads and is therefore also suitable for roofs with limited weight bearing capacity.

The advantages of **OPTIGRÜN-SOLAR SOLon** can be seen in combination with new or existing green roofs. The vertical elevation ensures an even supply of light and water to the vegetation so that the green roof can develop optimally.

The energy yield of the vertical system is comparable with a conventional east-west green roof elevation. Even earlier yield losses due to snowfall can be minimised. **OPTIGRÜN-SOLAR SOLon** therefore represents an economical solution for sustainable urban development.

The most important facts in brief



- > Subsequent installation on existing green roof
- > Very low weight of 12-22 kg/m²
- > Quick and easy installation without interfering with the existing green roof
- > Favourable yield profile with high electricity generation in the morning and evening hours
- > High total electricity yield

PLANS BECOME REALITY
WHEN EXPERTS ARE AT WORK

EXPERTISE FROM THE MARKET LEADER – CONTACT US CONTACT

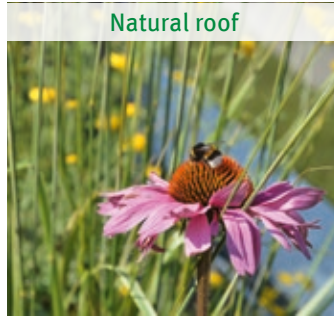
Economy roof



Lightweight roof



Natural roof



Solar green roof



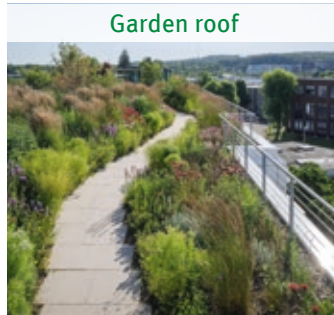
Meander retention roof



Retention roof throttle



Garden roof



Landscape roof



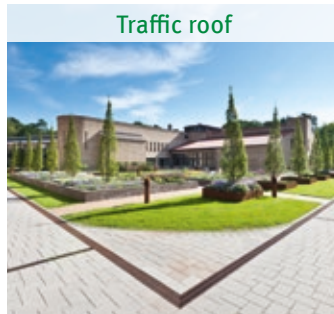
Urban gardening



Pitched roof



Traffic roof



System add-ons



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