



# Sika SolaRoof<sup>®</sup> WITH PHOTOVOLTAICS

CONCEPT FOR DURABLE INSTALLATION OF  
SarnaRoof<sup>®</sup> Solar Mount-2 (SSM2) AND PHOTOVOLTAIC MODULES ON FLAT ROOFS



# WORLDWIDE CONSTRUCTION AND INDUSTRY SOLUTIONS



Sika's history began in 1910 with the electrification of the Gotthard railway tunnels. The Swiss company founded by Kaspar Winkler played a decisive role in this momentous project. A revolutionary new waterproofing mortar was developed, marking the beginning of Sika's global reputation for high quality.

Today the Sika Group is a leading global manufacturer of construction chemical products and systems as well as industrial sealants and adhesives. The Group's core competencies – sealing, bonding, damping, reinforcing and protecting load-bearing structures – have been enabling a wide range of applications in the construction sector and in industrial production for over 100 years. The high-quality product range includes concrete admixtures, special mortars, sealants and adhesives, damping and reinforcing materials, floor coating systems, sealing membranes and corrosion protection products.

Sika annually produces a volume of roofing membrane that could cover the entire area of Manhattan. More than 10,000 roofing contractors in over 85 countries are Sika-trained and certified, which ensures qualified installation.

All our customers – developers, building owners, architects, engineers, consultants and contractors – receive expert advice from our highly competent team. Building on a foundation of trust, we offer our experience and knowledge to provide recommendations and long-lasting solutions for any project you may have.

Roofing can be selected and designed to meet the specific technical requirements and budget of almost any roofing project. Our tailored solutions allow freedom of design and form, with no limitations on geometry or color, to meet the specific requirements of any type of roof.

## STRATEGIC SUCCESS THROUGH GLOBAL PRESENCE

- With subsidiaries in 103 countries, Sika offers local presence worldwide
- Sika operates over 400 production sites and sales locations
- Sika employs approx. 33,000 people worldwide
- The Sika umbrella brand covers some 980 Sika product trademarks
- In fiscal year 2023 the Sika Group achieved sales of approximately CHF 11.24 billion



# Sika SolaRoof® WITH PHOTOVOLTAIC MOUNTING SYSTEM SSM2

## THE COMPLETE SOLUTION

**THE Sika SolaRoof® SYSTEM** is a lightweight, integrated solar solution for thermoplastic roofs that outperforms conventional mounting systems. It combines the proven performance of a Sika roofing system with SarnaRoof® Solar Mount-2 (SSM2) - the result is an innovative, engineered solution for long term securement of rooftop photovoltaic (PV) modules.

### ROOFTOP PHOTOVOLTAIC - THE PERFECT USE OF UNUSED ROOF SPACE

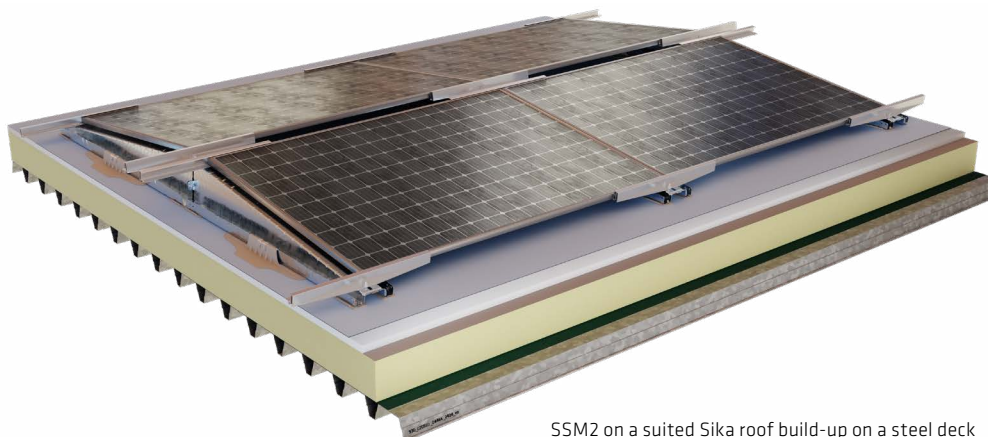
Rooftop solar installations are becoming increasingly popular worldwide, and empty flat roofs are perfect space resources. More and more building owners realize the opportunity to make effective use of their roof space and to improve their environmental footprint through sustainable electricity production. PV installations are sound investments, designed to provide a return over the long term. In addition, they reduce dependency on utility providers thanks to on-site power generation for in-house consumption, based on a service life expectancy of 20+ years. The correct roof build-up is key for durability. Sika has 50+ years of experience in the manufacture of single-ply membranes which are an ideal substrate for the SSM2 system.

Required Construction Elements	
<b>Sika roofing membrane</b>	New membrane for optimal roof situation. The life expectancy of a Sika roof build-up and photovoltaic system match perfectly. FPO and PVC membrane, minimum thickness 1.50 mm (2.00 mm for maximum guarantee coverage)
<b>Membrane fastening</b>	Mechanically fastened or fully adhered roof system*
<b>Thermal insulation</b>	<ul style="list-style-type: none"> <li>■ PIR, EPS or XPS thermal insulation boards (depending on local availability)</li> <li>■ Mineral wool thermal insulation board with compressive strength <math>\geq 70</math> kPa at 10 % deformation (per EN 826)</li> <li>■ Roof coverboards are an option for optimum load distribution, roof protection and enhancement of the fire class</li> </ul>
<b>Vapour control layer / barrier</b>	According to specific building physics requirements
<b>Roof structure</b>	<ul style="list-style-type: none"> <li>■ Steel deck (trapezoidal), concrete or timber</li> <li>■ Composite panels and standing seam metal roofs are not suitable for Sika SolaRoof® Systems</li> <li>■ The life expectancy of the roof structure should be at least as long as the one of the photovoltaic system</li> </ul>

\* Sika fastening system (spot fastening or induction welding) and adhesives.

Please consult Sika to assess whether your specific roof is suitable to become a Sika SolaRoof® System.

Architectural and Structural Requirements	
<b>Building height</b>	Not restricted - the limit for the installation of SSM2 are the resulting wind forces
<b>Roof slope</b>	Up to 5° (1:12 or 8 %) as standard Up to 10° with additional measure
<b>Roof load bearing capacity</b>	Sufficient for SSM2: this can be determined by a structural engineer once the system has been planned in detail



SSM2 on a suited Sika roof build-up on a steel deck

# SarnaRoof® Solar Mount-2 (SSM2)

## PHOTOVOLTAIC MOUNTING SYSTEM ON SIKA ROOFING MEMBRANES

**SSM2 IS THE PHOTOVOLTAIC (PV) RELATED PART OF THE Sika SolaRoof® CONCEPT.** It is an innovative, lightweight, aerodynamic PV racking system for the durable installation of rigid PV modules on flat or low-slope roofs.

### MAIN SSM2 SYSTEM COMPONENTS

- **SarnaRoof® Mount-2:** produced from a corrosion protected steel sheet with an angle of inclination of 7°.
- **SarnaRoof® Click:** the injection molded welding flanges are made from Sika's own FPO and PVC plastic compounds. They are chemically compatible with the roofing membrane and are hot-air welded to the membrane, to provide permanent and secure attachment. The flanges are mechanically fastened to the mount and transfer the wind loads into the membrane and the the roof structure. No leaks from screw penetrations or mount shifting in heavy winds will occur.
- **Short (60 cm) PV module mounting rails:** they are mechanically fastened to the mount and hold the PV modules in place. Different rail cross sections are available for various PV module frame heights.

Key Features of SSM2	
Module inclination angle	7° to the roof plane (not adjustable)
PV module orientation	PV modules on SSM2 mounts can be installed with either south or east-west orientation with the same components
PV module types	Framed crystalline PV panels, width up to 1135 mm and frame height 30-50 mm
Average areal weight	Approximately 10-18 kg/m <sup>2</sup> (including PV modules, depending on south or east-west orientation)
Stable positioning	With SSM2, there are no slip sheets, separation layers or friction enhancers required. The fixation of the SSM2 to the membrane avoids moving of the PV system on the roof
Protective measures	No membrane penetration of the roof build-up required, and chemical compatibility between the Sika-produced components ensured.



SSM2 mounts with SarnaRoof® Clicks, pads, metal bracket securements and short rails for the east-west installation

### SUITABLE SITUATIONS FOR SSM2 (SOME REQUIREMENTS SHALL BE RESPECTED)

- New membrane and fasteners from Sika, or specifically released other fastening methods.
- Wind load calculations confirm the suitability of the build-up for the specific situation on the roof at the location in mind.
- The SSM2 components will be delivered only to projects with a layout and that have been calculated according to the local guidelines.
- Grounding and lightning concepts shall be designed by a specialist, according to the local regulations.

### LONG TERM MONITORING PROGRAM

SSM2 is the successor of the "SSM1" PV system which is based on the same SarnaRoof® Click flanges. Since 2014, Sika conducts a monitoring program for the most exposed SSM1 installations. Annual examinations are conducted to check for material changes or other irregularities of membranes and fasteners. The positive results underline the durability of the concept.

**Please consult your Sika representative for more details.**

# SSM2 - SYSTEM TESTING, APPROVAL AND DESIGN

## THOROUGH EVALUATION AND CONFIRMATION BY APPROVAL BODIES

**THOROUGH FULL-SYSTEM TESTING OF SSM2 HAS BEEN CONDUCTED IN RECOGNIZED INTERNATIONAL LABS.** The Engineering focus is on the site-specific conditions and influences such as wind and snow loads and solar exposure. The PV solution must take these factors into account to meet the client's expectations on the long run. Certificates and approvals are available.

### SYSTEM TESTING

Mechanical, dynamic testing of all components and connections on original Sika roof build-ups with Sika roofing membranes has been conducted in different renown laboratories and construction institutes.

### FM 4478 APPROVAL

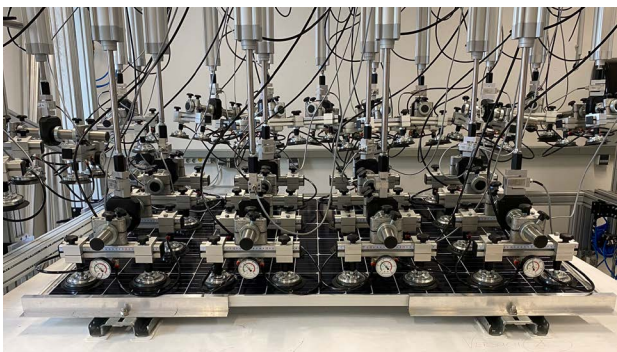
Having passed the stringent testing requirements of FM standard 4478, some variants of Sika SolaRoof® are the only solar solution for FM-insured buildings and those customers who are not insured by FM but view FM as the industry benchmark for performance, durability, and safety. The program involves fire and wind uplift testing for the roof assembly and PV system. Additionally, the PV modules are tested against hail and gravity loads.

The selection of roof build-up components and SSM2 with a FM 4478 approval is strictly limited. They are governed by the approval documents and can't be chosen arbitrary.

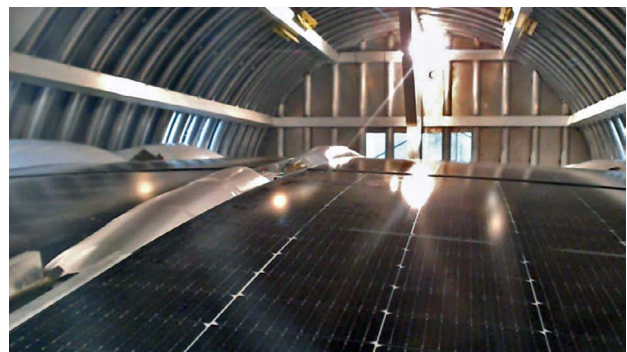


### DESIGN

The SSM2 layouts are designed by a commercial software which is customized for SSM2. It contains the specific values and findings from the wind tunnel evaluations by the "I.F.I. Institut für Industrieraerodynamik GmbH" in Aachen, Germany. The reports were peer-reviewed by the US based Wind Engineering Consultants "cpp". For every potential project, a suitable PV layout is generated. Inputs are crucial project specific input parameters like location, building specific parameters and the selection of the Sika membrane and fastening type and geometry. The maximum wind loads are calculated according to the common standards and shall be within the limits of the SSM2 system.



Uplift test to SSM2 with pneumatic cylinders



Wind uplift test with east-west oriented SSM2



Mechanically applied uplift loads to a PV module on two SSM2 mounts



Wind tunnel test model



# SSM2 - APPLICATION

FAST, EASY, SAFE, FEW COMPONENTS AND NO ROOF PENETRATIONS

**A UNIQUE FEATURE OF SSM2 IS THAT THE SSM2 PLANT CANNOT MOVE ON THE ROOF SURFACE OVER THE LONG TERM.** The SarnaRoof® Click flanges are attached to the roofing membrane by hot-air welding and transfer the loads to the roof structure. Strong emphasis is put on the training of authorized applicators to weld Sika roofing components.

## TWO WAYS OF APPLICATOR COMPANY INVOLVEMENT

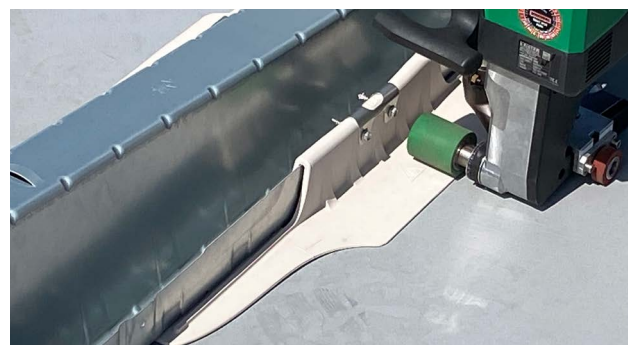
- **Roof applicator:** To achieve the highest flexibility during application, the roofer who installed the roof structure can assemble the SSM2 system, after completing special training. The advantage of this is that the same company can also weld the SarnaRoof® Clicks (FPO and PVC) to the roofing membrane. The electrical installations are usually done by a specialized company, afterwards.
- **Solar installer:** Assembly and installation of SSM2 can also be done by a solar installer to be trained - ideally the same installer which will carry out the electrical installation of PV modules, inverters etc. on the same job site later. However, the welding process of the SarnaRoof® Clicks shall be carried out by a Sika Sales Organisation certified roof applicator.



Application of the SSM2 system requires only a limited number of components to be assembled on site. This allows fast and easy setup of the PV plant. Application manuals with step-by-step illustrations are provided by Sika.



Mount positioning along the chalk lines



Hot-air welding of a SarnaRoof® Click flange with a semi-automated welding machine



**Video:**  
Sika SolaRoof® with SSM2

### USPs of the Sika SolaRoof® system:

- No lateral movement (sliding)
- Low weight
- No roof penetration
- Passed the testing requirements of FM standard 4478
- Fast assembly with very few components
- Chemical compatibility of all system components

# SSM2 - EXPERIENCE

THE FIRST INSTALLATIONS ARE IN OPERATION SINCE 2023

The first SSM2 installations on Sika roof build-ups with mechanically fastened and adhered membranes confirmed the suitability and expected ease and speed of installation.

## SSM2 PLANT AND DEMO INSTALLATION



Switzerland



Germany

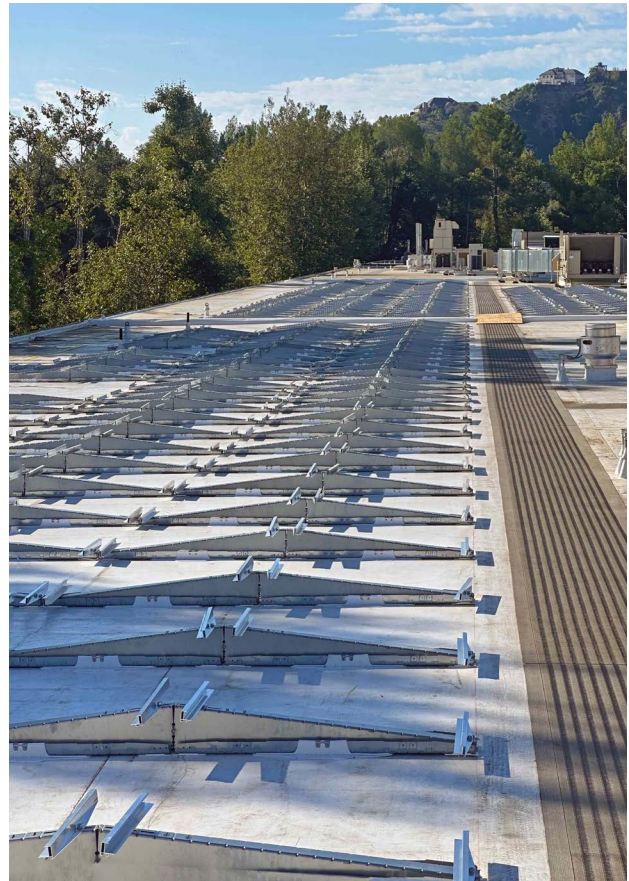
## OTHER SSM2 INSTALLATIONS



Portugal



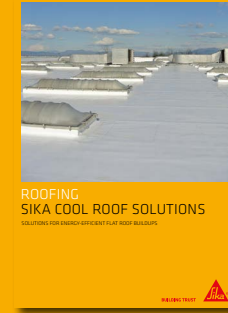
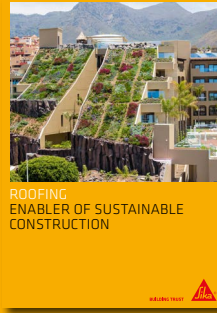
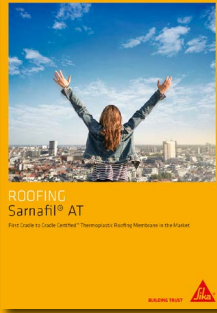
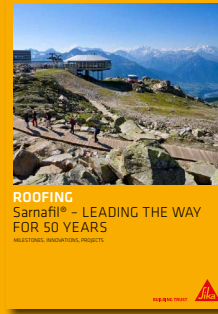
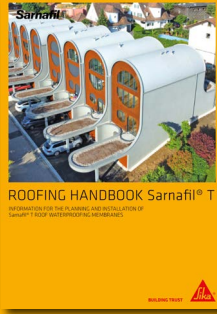
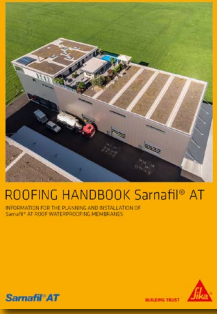
China



USA



# FURTHER ROOFING PUBLICATIONS ALSO AVAILABLE FROM SIKA



## WE ARE SIKA

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing and protecting in the building sector and the motor vehicle industry. Sika's product lines feature concrete admixtures, mortars, sealants and adhesives, structural strengthening systems, flooring as well as roofing and waterproofing systems.

Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



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