

# Leading Architecture Integrated Photovoltaics

Designed Building Integrated Photovoltaics (BIPV)  
Made in Switzerland



reddot winner  
urban design

MEGASOL

*me*gasol



◀ Residential block in Basel | FAST facade system

▲ PLVS VLTRA Company building in Amsterdam | FAST facade system

# Overview

## Building-integrated photovoltaics

<b>Impressions</b>	<b>4</b>
It is surprising how harmoniously sustainable energy generation follows the lead of architecture. Technology has cast off adolescence and achieved maturity and flexibility.	
<b>Design</b>	<b>11</b>
New methods have enabled accents and nuances. Subtle playing with invisibility is achieved just as successfully as an uncompromising display of technology as a design element.	
<b>Efficiency</b>	<b>16</b>
The prescience of Perpetuum Mobile manifests itself in the building when integrated photovoltaics transform costs into returns.	
<b>Safety</b>	<b>20</b>
Integrated systems form the framework of the design. The top priorities are safety and adaptability.	
<b>Cooperation</b>	<b>39</b>
Individual consulting services are embedded into a project road map that ranges from a draft all the way to realisation and operation. The interfaces are open.	
<b>Responsibility</b>	<b>40</b>
Shaping the future comprises all areas of a living environment. In daily work, responsibility becomes the foundation of entrepreneurship.	
<b>Company</b>	<b>43</b>
The vision of one man has been inspiring and shaping the company for 30 years.	

# Facade integration

Customized shapes **11** | Individual colours **12** | RearCon module technology **19**  
FAST facade system **20** | NICER X integrated system **28** | Consulting services **31**



▲ dsm Company building in Amsterdam | FAST facade system



▲ Coop headquarters in Basel | FAST facade system

Photo: Aepli Metallbau AG

# Roof integration

Border and special modules **10** | Designed appearance **11** | HiR cell technology **17**  
MATCH Slate **22** | MATCH Tile **26** | LEVEL integrated system **30** | NICER X integrated system **34**



# Open structures



▲ Valley station Klein Matterhorn | 2'923 m.a.s.l. | Swiss Solar Prize 2018

Image: Solarbau Lowel GmbH



▲ Covered cycle path in Geneva | NICER X

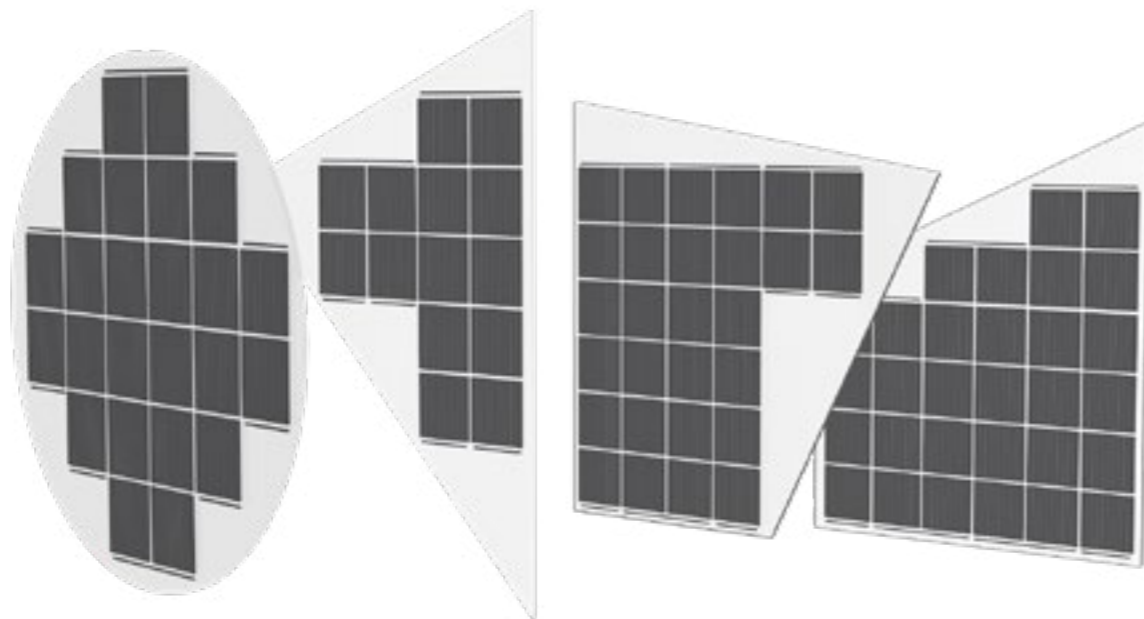
Bild: © O. Bain-SIG

# Completed metamorphosis

Solar modules are concluding their development towards a freely designable building material. The design of this building material starts with the vision of the overall project. These steps lead from the central idea to the solar module.

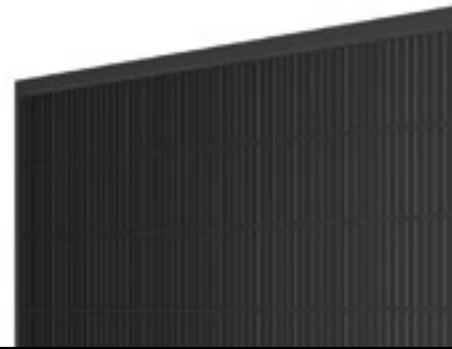
## 1 The grid defines the shape, size and power of the solar modules

Rectangles, triangles, polygons, circles, curves, cut-outs: the free choice of the solar modules' geometries is the starting point for the design. The measurements range from 200 x 300 mm to 2'300 x 4'100 mm. Glass thicknesses of 2 - 12 mm per pane can be processed. Cost advantages are achieved by using the standard size of 1'669 x 999 x 8 mm. The degree of hardening (TVG, ESG) can be chosen freely.



Special shapes

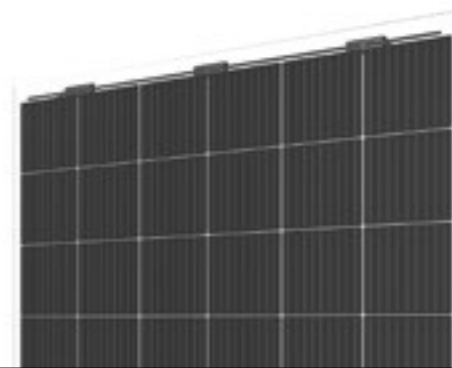
## The character results from the colours and their intensity



**Fine Line:** The classical pinstriped look allows accents with the help of technology. This design option is the most efficient both in terms of performance and costs.



**Totally Black:** By moving the busbars (cell contacts) to the backside, discretion can be increased, so that the technology is only visible at second glance.

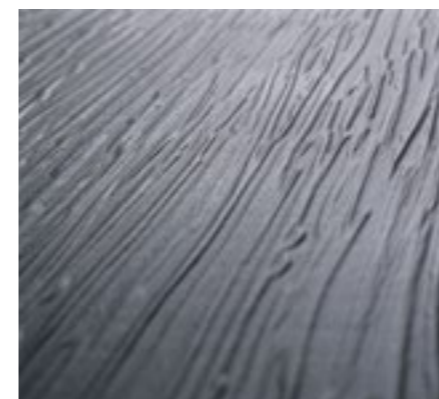


**Translucent:** Solar modules with translucent cell spacing for open structures. The degree of light transmission and output performance can be balanced by adapting the cell spacing.



**Fine Art:** The colour of the solar modules is open. It is possible to design with light pastel tones, as well as with rich earthy tones. Three sources can be used for the choice of colour:

- > SOLARCOLOR colour chart (time and cost-efficient)
- > NCS colour chart (wide colour spectrum)
- > Individual colour development (completely open)



«Creek Granite Grey» with ZeroReflect

## Upgrade ZeroReflect

The acceptance of solar installations among the population is very high. It is reinforced constantly with new types of designs and unrestricted individualisation options. ZeroReflect is a surface developed in the Megasol design laboratory that is glare- and reflection-free – regardless of the installation situation, angle or time of day.

It is used for particularly high demands in terms of «glare-free» solar modules. These include special installation situations, sensitive, subjective perception or regulatory restrictions (e.g. traffic junctions).

# SOLARCOLOR Classic

High colour intensities (opacity) make the cell structure disappear, keeping the solar secret of the building envelope. Light intensities, on the other hand, allow a technoid impression and performance up to 95% of a conventional solar module.

On solarcolor.ch, it is possible to create and order individual samples. The following glass color chart is also available on solarcolor.ch.



▲ SOLARCOLOR color chart

# SOLARCOLOR Morpho

## Intensive colouring without colour pigments

SOLARCOLOR Morpho enables intensive colouring with the help of a new type of coating without colour pigments. The coating ensures targeted light refraction, which only reflects a closely coordinated component of the light. This creates the desired colour impression. Most of the light reaches the surface of the solar cell unhindered. Thanks to this narrow band of reflection, a SOLARCOLOR Morpho solar module has up to 94% of the efficiency of a conventional black solar module. The colour impression remains largely angle-stable.

## Guiding star nature

The Morpho butterfly served as the inspiration for the coating. The colouring of its bright blue wings is based on the same principle: it is not colour pigments but a narrow-band reflection that produces the colour impression, which is stable over a wide range of angles.



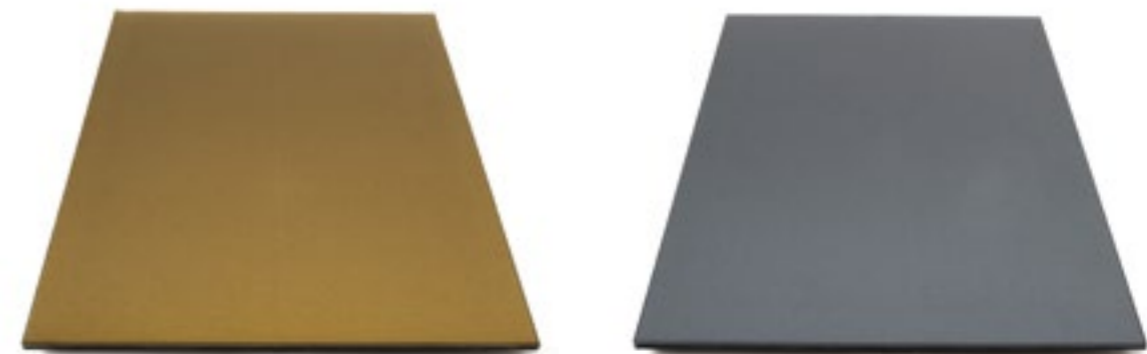
## Variety of colours

**Colours:** Gold, silver, bronze, terracotta, blue, green, red, more colours in development

**Full-surface application:** The colouring is applied exclusively over the entire surface.

**Available glasses:** The choice of glass is free. The glasses Crystal, Fjord and Frost are exceptionally suitable for coating.

**Metalisé:** It is possible to give the surface a special shine ("metalisé").



▲ SOLARCOLOR Morpho modules in gold and silver



## 3

**The appearance determines the surface of the solar modules**

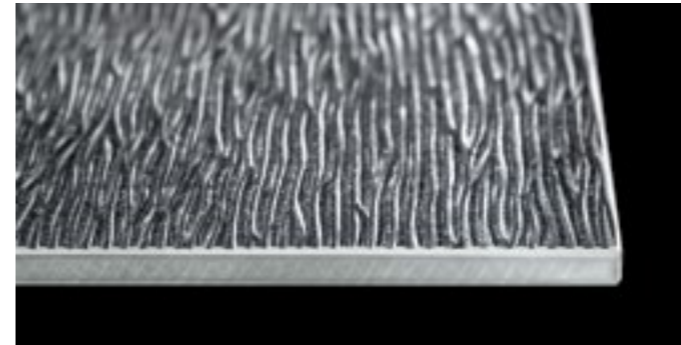
The full spectrum of the material «glass» is available for the design. Structures and finishes of surfaces are possible, along with the targeted use of reflections. The solar glasses «Fjord» and «Crystal» are the basis of most integrated solar modules, due to their subtle structuring and highest efficiency. This structuring ensures a high light transmission and minimal glare.



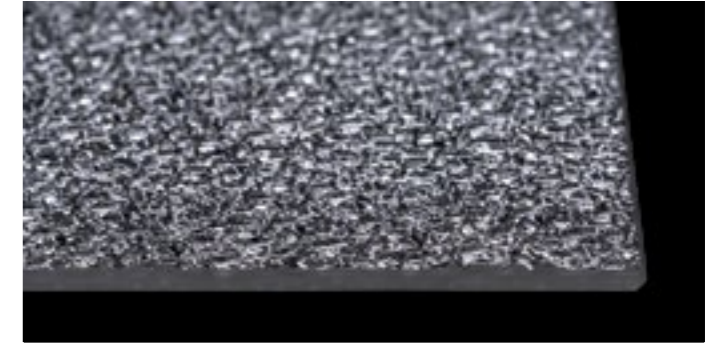
A Mountain Lake



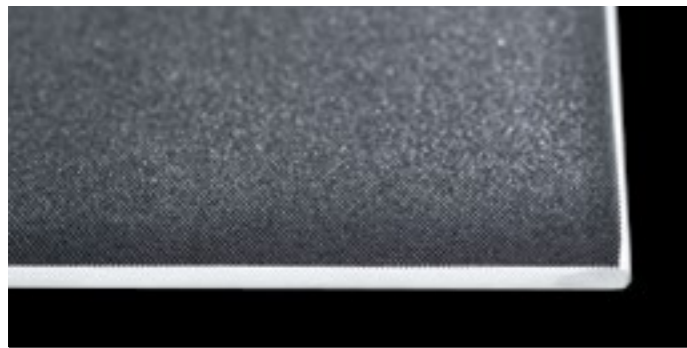
B Frost



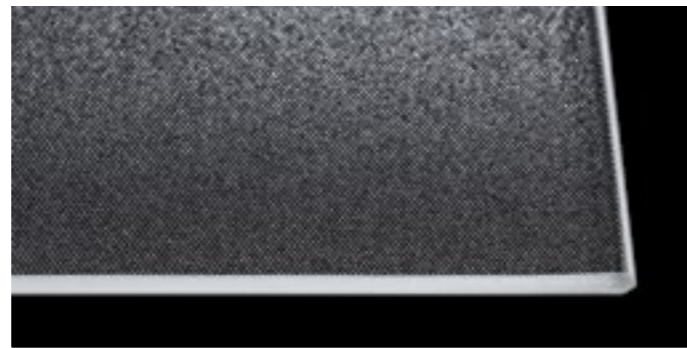
G Stream



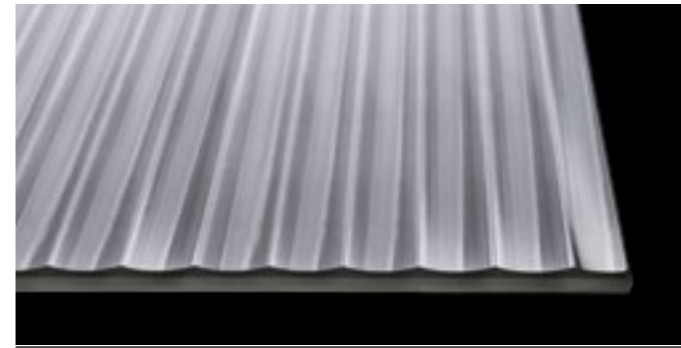
K Ice Diamond



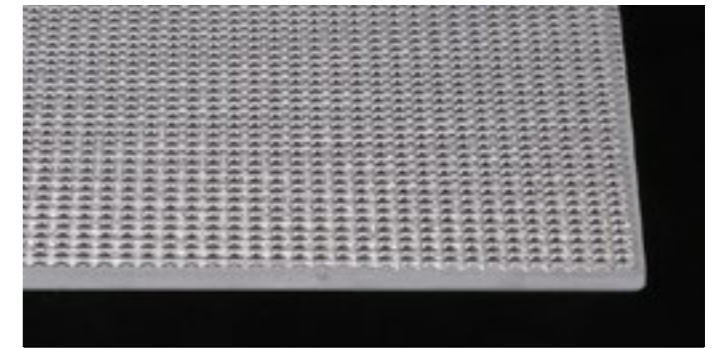
C Fjord



D Crystal



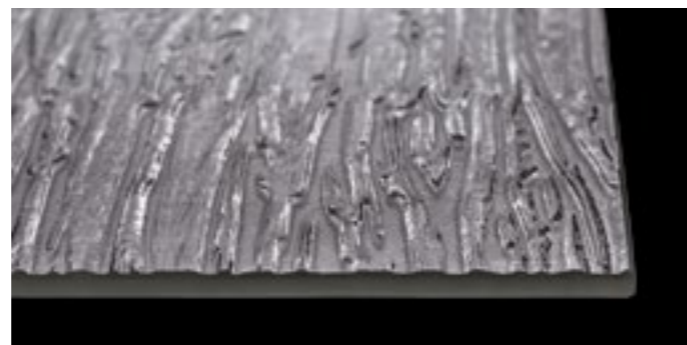
L Ripple



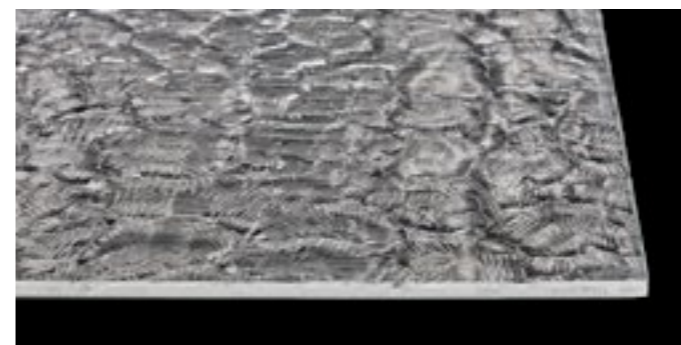
M Ice Molecule



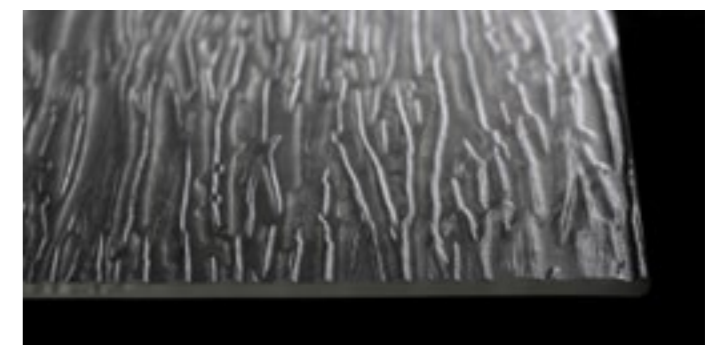
E Glacier



F Creek



O Seaside



P Creek Granite





# From costs to yields

Solar integrations are profitable investments. The reasons for this are, firstly, that the additional investments compared to conventional building envelopes represent a fraction of the total project costs. Secondly, solar building envelopes generate yields and amortise within a few years. In the period after that, they generate earnings and become profitable power plants. Two examples.

Example 1

## Single-family home in Basel-City CH, Roof covering energetic roof renovation with LEVEL (10 kWp)

Costs for 60m <sup>2</sup> roof area	Tiled roof	Solar roof	
Construction site equipment (scaffolding, lifting equipment, etc.)	4'500 CHF	4'500 CHF	
Insulation and sub-roof	10'500 CHF	10'500 CHF	
Roofing material	2'400 CHF	13'600 CHF	
Roofing labour	3'000 CHF	3'000 CHF	
Electrical installation	0 CHF	5'400 CHF	
Planning & project management	4'000 CHF	5'500 CHF	
Subsidies	- 3'000 CHF	- 10'500 CHF	
Tax benefit	- 4'700 CHF	- 7'100 CHF	<b>Difference</b>
<b>Net investment</b>	<b>16'700 CHF</b>	<b>24'900 CHF</b>	<b>+ 8'200 CHF</b>
<b>Net revenue over 40 years</b>	<b>0 CHF</b>	<b>+ 60'000 CHF</b>	<b>+ 60'000 CHF</b>

Example 2

## Office building in Basel-City CH, facade renovation with FAST (116 kWp)

Costs for 1'400m <sup>2</sup> facade area (window share: 50%)	Ceramic facade	Solar facade	
Construction site equipment (scaffolding, lifting equipment, etc.)	20'000 CHF	20'000 CHF	
Curtain wall facade (insulated, installed, 700m <sup>2</sup> )	280'000 CHF	336'000 CHF	
Windows (triple glazing, installed, 700m <sup>2</sup> )	238'000 CHF	238'000 CHF	
Electrical installation	0 CHF	28'000 CHF	
Planning & project management	30'000 CHF	38'000 CHF	
Subsidies			
Subsidy for energy-efficient facade renovation	- 84'000 CHF	- 84'000 CHF	
PV subsidy: One-off remuneration	- 0 CHF	- 37'000 CHF	
PV subsidy: «Inclination angle bonus»	- 0 CHF	- 29'000 CHF	<b>Difference</b>
<b>Net investment</b>	<b>484'000 CHF</b>	<b>510'000 CHF</b>	<b>+ 26'000 CHF</b>
<b>Net revenue over 40 years</b>	<b>0 CHF</b>	<b>+ 348'000 CHF</b>	<b>+ 348'000 CHF</b>

# HiR cell technology

Highest cell efficiency and lifetime thanks to 0% PID & LID

## The new proprietary cell technology

HiR (pronounced like the word «higher») is a proprietary cell technology from Megasol. HiR is based on n-type wafers, which for decades have proven to be the highest quality and most stable technology.

The n-type HiR technology combines charge carrier selective contacts, so-called ultra-thin tunnel oxides (SiO<sub>2</sub>), with a sophisticated multi-stack metallization and a multi-level anti-reflective coating.

In the market, PERC modules with 4-5% power degradation due to PID or LID are also considered «PID-free». However, a 4-5% difference in yield can have a massive impact on the economic profitability of solar plants.

## Better economic profitability and higher project yields

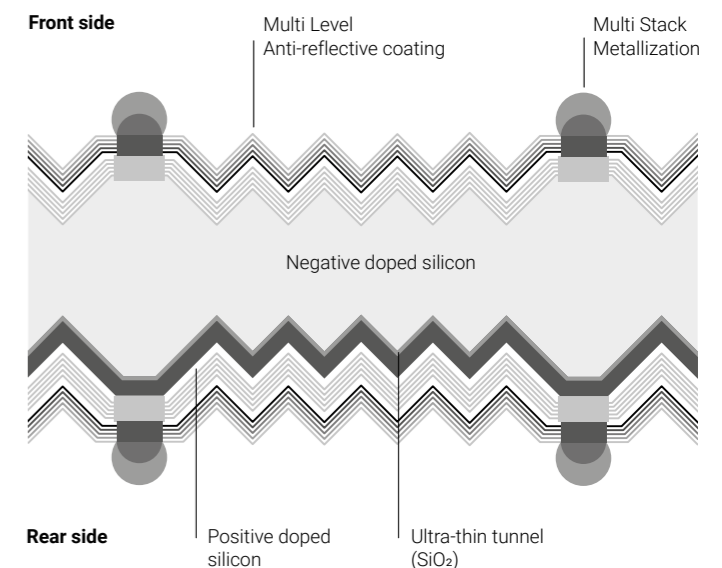
- > n-type HiR modules have a very high power output combined with very compact dimensions. More yield per roof area leads to higher economic efficiency and better project yields.
- > An optimal thermal coefficient and better low-light performance lead to more yield per kWp.
- > All HiR modules are bifacial and have a significantly higher bifaciality factor compared to conventional bifacial solar modules (over 90% instead of 70-75%).
- > Considerably lower proportion of grey energy

## How it works: simply explained

The ultra-thin tunnel oxide layer reduces recombination losses and thus significantly increases efficiency. The very fine front and rear contact grids guarantee ideal electrical current absorption capability with good solderability and conductivity thanks to their layers that have each been optimised for their respective characteristics. Thanks to the anti-reflective coating, which is not only classically single-layered but multi-layered, the reflection losses on the cell surface are minimised. At the same time, the cell surface appears darker (black), which makes it even more attractive for projects with high aesthetic requirements.

## Longer service life and longer warranty periods

- > Glass-glass modules are extremely durable and come with a 15-year Swiss product warranty and a 30-year linear performance warranty.
- > Best wattage prices per warranty year



# Glass-glass solar modules

Two glass panes are combined into one solar module. They become laminated safety glass and therefore have unique properties.

## Areas of application

Applications include facades, railings, in-roof and on-roof applications, infrastructure structures (for example, dams, noise barriers, etc.), open spaces, carports, alpine and desert applications.

## Properties

Front and back glass in combination with durable encapsulation material protect the components from vapour penetration. In the «neutral zone» between the panes, the cells remain stress-free (no compression or bending) which reduces the occurrence of so-called micro cracks. This results in a potential lifespan of over 50 years.

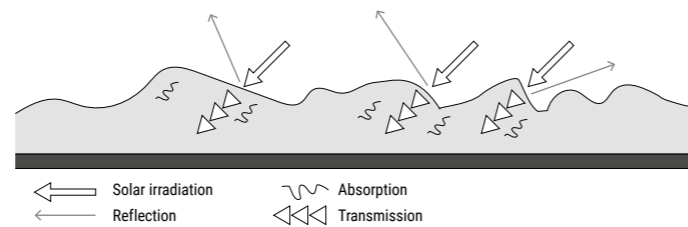
Freedom of design, high durability and stability characterize this solar building material.

## Solar roof systems

The LEVEL, NICER X, MATCH slate and MATCH tile solar roof systems are based on glass-glass solar modules.

## Non-glare solar glass

Particularly low-glare surface structures are used. The solar modules can be provided with the ZeroReflect design for complete freedom from glare.



## Technical specifications

Megasol cell technologies: Mono HiR / Mono RearCon

Cell formats: 158.75 (G1 HiR), 166 x 83 (M6 Rearcon HC), 182 x 91 (M10 HiR HC) 210 x 105 (G12 HiR HC), 182 x 105 (G10 HiR HC)

Cell geometries: Full-square, Half-cut

Typical performance (Full Black)\*: 184-232 Wp/m<sup>2</sup>

Typical performance (color)\*: 150-210 Wp/m<sup>2</sup>

Encapsulation material: PV encapsulant

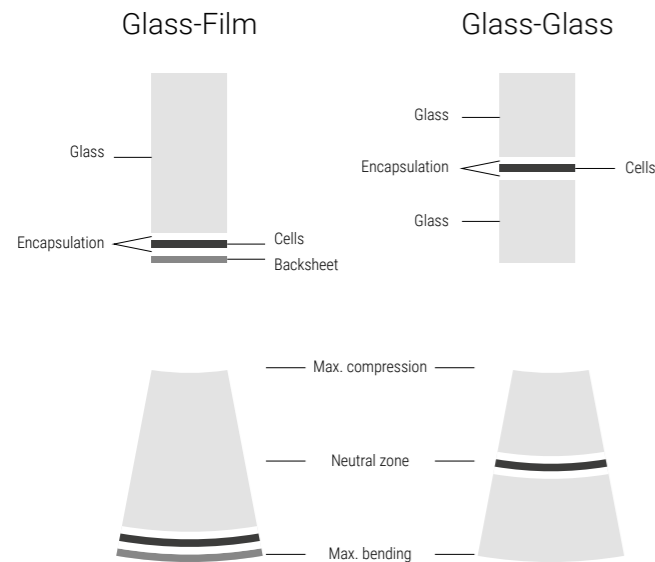
Glass thicknesses per glass: 2 – 12 mm

Hail protection: Hail protection class 5 (grain size 50 mm)

Fire protection: B<sub>ROOF</sub>(t1) in accordance with DIN EN 13501-5 (hard roofing, abP), the top cover layer and the rear side are made of heat-resistant glass. The construction is made of aluminum.

Tightness against driving rain: according to CEN/TR 15601

\*The square meter output of the solar module depends on the specific format



# RearCon module technology

Elegant, deep black design, free of visible contacts, 23.2% cell efficiency – RearCon is a gamechanger.

## Contacts on the rear side

RearCon means «Rear Contact». All contacting that was previously visible has been moved from the front to the back. This technology is a game changer in terms of performance, price, durability and aesthetics.

## Three innovations for more performance

RearCon solar modules achieve module efficiencies of up to 23.2 %. RearCon's performance gains are achieved through the following technological innovations:

- > Dispensing with front contacting leads to more active cell surface and thus to higher efficiency.
- > Busbars with particularly high conductivity reduce internal resistance (lower ohmic losses).
- > Gapless modules: The cell bar spacing of - 0.3 mm (traditionally +2.0 mm) leads to space savings and higher efficiency.

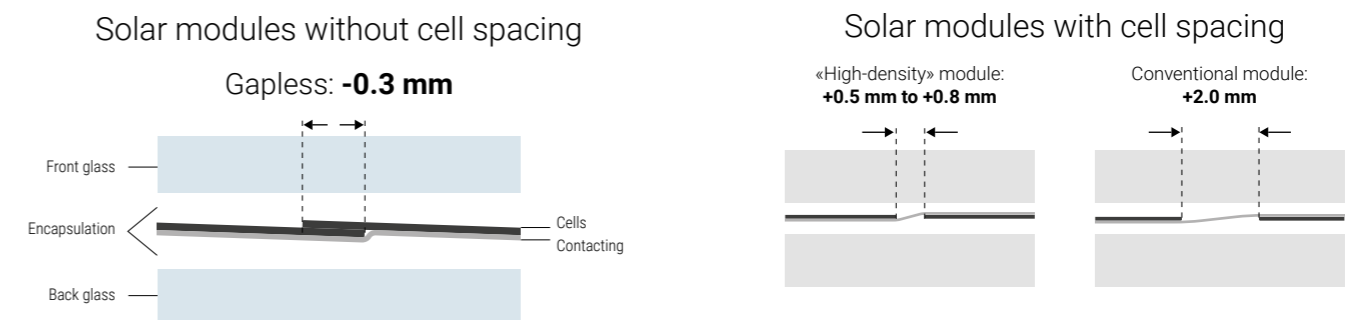
## Design and aesthetic integration

The innovations in the area of aesthetics include these key points:

- > The contacts on the front side («pinstripe look») are completely eliminated
- > RearCon modules have black, homogeneous «Totally Black» surfaces
- > The cells overlap slightly («gapless») – the classic «square structure» is avoided

## Price superiority

Due to the technology, the production costs for RearCon are considerably lower. RearCon technology requires a significantly lower number of production steps than the production of previously known rear-contacted solar modules. This cost advantage is passed on. RearCon solar modules are therefore at a significantly lower price level than previous rear-contacted solar modules.



# FAST facade system

Substitution of all conventional facade elements with the most efficient solar facade in the world.

## Areas of application

FAST is suitable for all areas where curtain wall systems are used. These include, for example, single-family homes, apartment buildings and high-rise buildings. Floor-high solar modules can be inserted into the FAST mounting system. It is used for particularly high static and aesthetic requirements.

## How it works

The solar modules with backrails are placed into the horizontal profiles and folded up like a tilting window. They are fixed by a slide safety catch. Later dismantling is possible without restrictions.

## Flexibility

Glass-glass modules used on the facade are usually custom made. Their shape, colour, size and surface can be individually designed. Price advantages can be achieved when using the standard measurements. Notes on the design process can be found on p. 39.

## Compatibility

The FAST facade system is compatible with vertical structures in all standard materials (wood, aluminium, steel).

## System interface

The adhesion of the backrails on the rear side of the module takes place in-house. This reduces technical, administrative and logistical interfaces as well as expenses.

## Type of installation

The mounting is concealed by means of backrails on the rear side.

## Installation time

10 m<sup>2</sup> / man-hour (experienced installation personnel)

## Components

- > Glass-glass solar modules with SSG adhered backrails and mechanical support
- > Horizontal rail, slide safety catch
- > Vertical structure as well as consoles/spacer screws are often provided on site. If required, they are part of the package.

## Technical specifications

Solar module type: glass-glass (colours, shapes, thicknesses, surfaces can be freely defined)

Vertical adjustment: +/- 4 mm, on the front also possible after mounting

Typical span width of the horizontal profile: 800 mm

Hail protection: Protection class 5 (hailstone size 50 mm)

Fire safety classification: B - s1, d0 according to European fire protection standard EN 13501-1.

The construction is made of aluminum.

Vertical support: mechanical (lower edge of solar module)

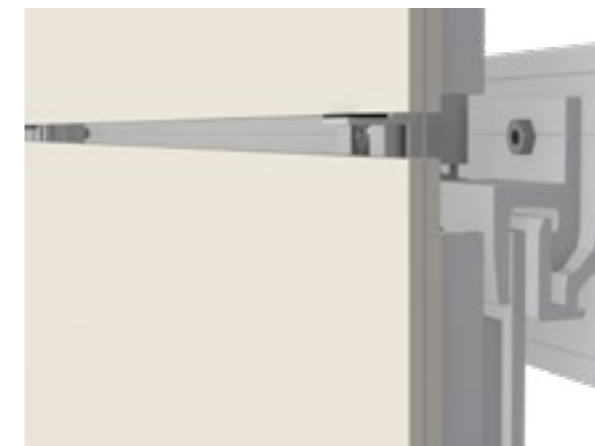
## Mounting procedure and options



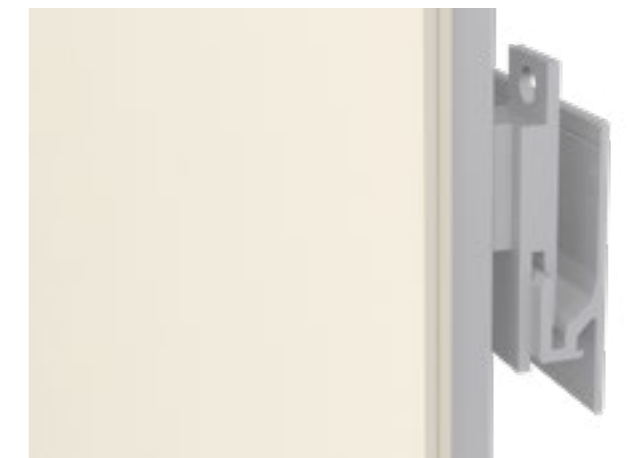
1 Apply transverse profiles to the vertical structure of the building.



2 Place module, inclination is possible for cabling.



3 Secure module temporarily and adjust, +/- 4mm also possible after mounting.



4 Secure and adjust the module provisionally



Option: Concealed mounting



Storey-high modules feasible without problems



Video and technical documentation:  
[megasol.ch/en/fast](https://megasol.ch/en/fast)

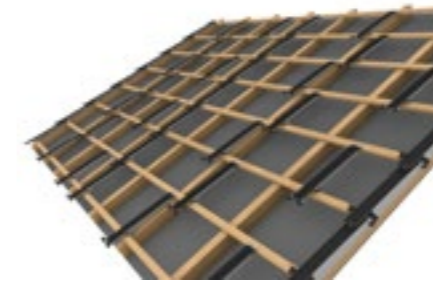
# MATCH Slate



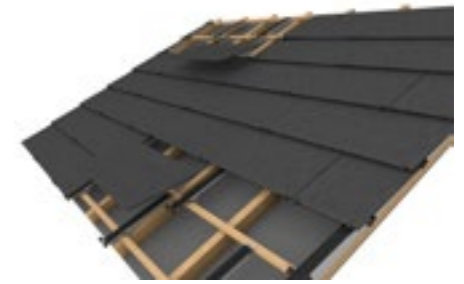
Complete roof covering or in combination with shingle-like roof coverings.



1 Preparing the roof battens



2 Install module hooks



3 Insert MATCH Slate modules

## Areas of application

MATCH Slate is predestined for roof-integrated systems with high aesthetic requirements – especially for projects where the design of the roof is based on a classic shingle look and/or demanding roof geometries exist.

## How it works

The system is built on a conventional roof battening. The solar modules are fixed to the roof with discreet MATCH hooks and form a seamless transition to the roof edges, whereby no on-site metal sheeting work is required. MATCH Slate can also be perfectly integrated into an existing shingle roof covering (e.g. aluminium composite panels, fibre cement, glass elements, etc.)

## Flexibility

Intelligently designed standard formats give the system a high degree of flexibility. Customer-specific sizes can be produced. The formats can be combined in any way in different installation layouts and thus give the roof an unmistakable character.

## Installation type and time

MATCH Slate is used just like classic roof shingles. The installation time is also based on this.

## Design

MATCH Slate is available in the standard designs Fjord Totally Black and Creek Granite Grey.

Individual colours and glass surfaces can be freely designed according to SOLARCOLOR (solarcolor.ch). Design options are illustrated on pages 12 - 15.

## Components

- > MATCH Slate module
- > MATCH Slate hook and stopper
- > *Anchoring device for personnel protection (optional)*

## Sub-roof requirements

- > Roof pitch above 25°: sub-roof for normal demands
- > 14° - 25°: for increased demands
- > 6° - 13°: for extraordinary demands

## Technical specifications

Solar module type: Frameless glass-glass modules

Hail protection: Hail protection class 5 (grain size 50 mm)

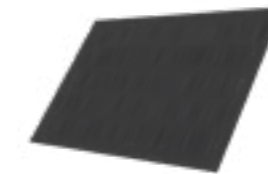
Fire protection: B<sub>ROOF</sub>(t1) in accordance with DIN EN 13501-5 (hard roofing, abP), the top cover layer and the rear side are made of heat-resistant glass. The construction is made of aluminum.

Tightness against driving rain: according to CEN/TR 15601

## Module formats



Cellular matrix: 2 x 3 half cells  
Grid dimensions: 362 x 380 mm



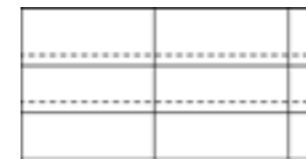
Cellular matrix: 2 x 7 half cells  
Grid dimensions: 724 x 380 mm



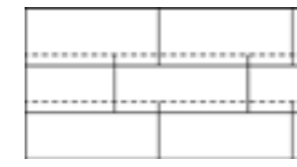
Cellular matrix: 2 x 12 half cells  
Grid dimensions: 1086 x 380 mm

## Examples of installation layouts

MATCH Slate can be freely combined with other individual installation layouts.



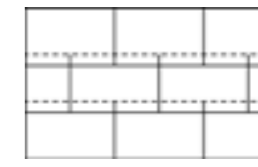
Normal 2 x 12



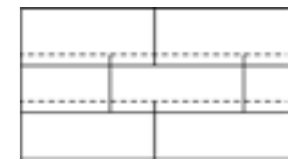
Offset 2 x 12 with 2 x 7



Offset 2 x 12 with 2 x 3



Offset 2 x 7 with 2 x 3

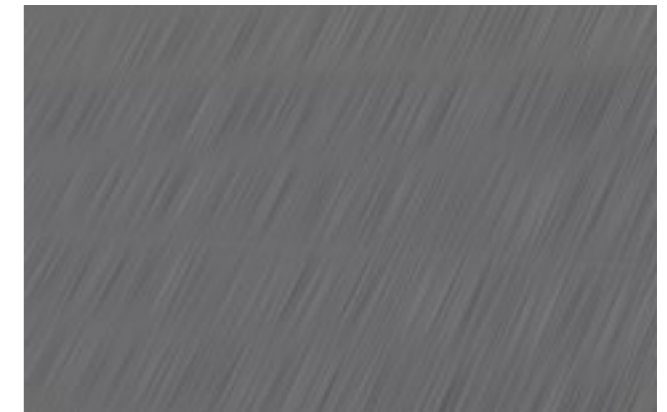


Combo 2 x 12 & 2 x 7 & 2 x 3

## Standard designs



Fjord Totally Black



Creek Granite (ZeroReflect)



Video and technical documentation:  
[megasol.ch/en/match/slate](https://megasol.ch/en/match/slate)

Order now directly on [store.megasol.ch/en\\_US/match-slate](https://store.megasol.ch/en_US/match-slate).



▲ Single-family house in Waldkirch | MATCH Slate roof-integrated system, next to it: a rooftop system on a garage.



▲ Apartment house in Winterthur | MATCH Slate roof-integrated system

# MATCH Tile

Solar roof covering in combination with roof tiles.

## Areas of application

MATCH Tile is predestined for roof-integrated systems with high aesthetic requirements – especially for projects where the design of the roof is based on a classic tile look and/or demanding roof geometries exist.

## How it works

The system is built on a conventional roof battening. The solar modules are fixed to the roof with discreet MATCH hooks and form a seamless transition to the roof tiles, whereby no on-site metal sheeting work is required.

## Compatibility

MATCH Tile is compatible with the following roof tiles:

- |   |        |
|---|--------|
| > Creaton Cantus                            | type A |
| > Gasser FS03 & MS95                        | type A |
| > ZZ Wancor Plano                           | type B |
| > Nelskamp G10                              | type C |
| > AGZ Ziegeleien AG GS37 Glattschiebeziegel | type D |
| > Jacobi Walther Z10                        | type E |
| > Erlus Level RS                            | type F |

(other manufacturers/tiles on request)

## Installation type and time

MATCH Tile is used just like classic roof tiles. The installation time is also based on this.

## Design

MATCH Tile is available in the standard designs Fjord Totally Black, and Fjord Terracotta. Individual colours and glass surfaces can be freely designed according to SOLARCOLOR (solarcolor.ch). Design options are illustrated on pages 12 - 15.

## Components

- > MATCH Tile module
- > MATCH Tile hook

## Sub-roof requirements

- > Roof pitch above 25°: sub-roof for normal demands
- > 14° - 25°: for increased demands
- > 8° - 13°: for extraordinary demands

## Technical specifications

Solar module type: Frameless glass-glass modules

Hail protection: Hail protection class 5 (grain size 50 mm)

Fire protection:  $B_{ROOF}(t1)$  in accordance with DIN EN 13501-5 (hard roofing, abP), the top cover layer and the rear side are made of heat-resistant glass. The construction is made of aluminum.

Tightness against driving rain: according to CEN/TR 15601



1 Preparing the roof battens



2 Fitting module hooks



3 Insert MATCH tile modules

## Examples of module formats

All current formats for all compatible tiles can be found at [megasol.ch/match/tile/](https://megasol.ch/match/tile/) "MATCH tile planning information".



Cellular matrix: 2 x 12 half cells  
Cellular matrix: 1115 x 380 mm  
(Module type **A5**, replaces 5 tiles)



Cellular matrix: 2 x 11 half cells  
Cellular matrix: 1020 x 380 mm  
(Module type **B4**, replaces 4 tiles)



Cellular matrix: 2 x 11 half cells  
Cellular matrix: 1000 x 385 mm  
(Module type **C4**, replaces 4 tiles)



Cellular matrix: 2 x 9 half cells  
Cellular matrix: 848 x 370 mm  
(Module type **D4**, replaces 4 tiles)

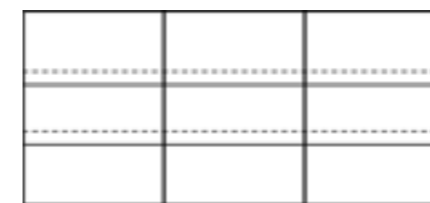


Cellular matrix: 2 x 11 half cells  
Cellular matrix: 1060 x 380 mm  
(Module type **E4**, replaces 4 tiles)



Cellular matrix: 2 x 5 half cells  
Cellular matrix: 920 x 390 mm  
(Module type **F4**, replaces 4 tiles)

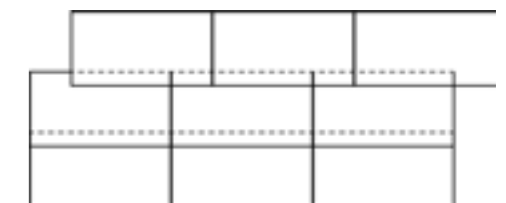
## Installation layouts



Normal



Offset



Customized

## Standard designs



Fjord Totally Black



Fjord Totally Black ZeroReflect



Fjord Terracotta



Video and technical documentation:  
[megasol.ch/en/match/tile](https://megasol.ch/en/match/tile)



▲ Apartment building in Zurich | MATCH Tile roof-integrated system



▲ Single family home in Hohenrain | MATCH Tile roof-integrated system

# LEVEL roof-integrated system

Overlapping solar roofing for full-surface coverage.

## Areas of application

LEVEL is used for pitched roofs, challenging roof geometries, individual roof integrations, as well as facades.

## How it works

The holding hooks are screwed onto the roof battens. The sealing rails are fitted onto them. The solar modules are laid in. Later dismantling is possible without restrictions.

## Flexibility

Half and quarter modules with identical appearance are among the standard components of the system. The basic palette contains three colour versions. More complex design requirements (colour, surface) can be realised with individually designed solar modules.

## Compatibility

The LEVEL roof-integrated system can easily be combined with all standard roof coverings such as roof tiles, shingles or aluminium composite panels. A skylight (Wenger Fenster) specially developed for the LEVEL roof-integrated system enables seamless integration. LEVEL can be equipped with an integrated snow guard.

## Type of installation

The system is laid overlapping, using the conventional or English method (horizontal offset).

## Installation time

10 m<sup>2</sup> / man-hour (experienced installation personnel)

## Components

- > LEVEL solar modules
- > Holding hooks
- > Sealing rails
- > *Snow guard (optional)*
- > *Wenger skylight (optional)*
- > *Anchoring devices for personal protection (optional)*

## Sub-roof requirements

- > Roof pitch above 25°: sub-roof for normal demands
- > 14° - 25°: sub-roof for increased demands
- > 6° - 13°: sub-roof for extraordinary demands
- > 3° - 5°: sub-roof with flat roof quality

## Technical specifications

Solar module type: Frameless glass-glass modules

Grid dimension: 1700 x 1016 mm

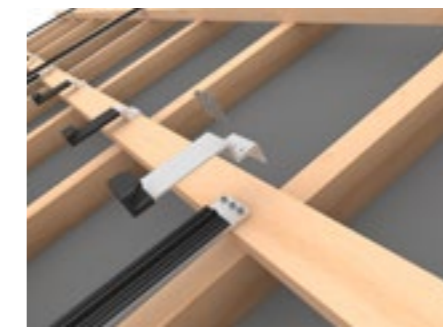
Hail protection: Hail protection class 5 (grain size 50 mm)

Fire protection: B<sub>ROOF</sub>(t1) in accordance with DIN EN 13501-5 (hard roofing, abP), the top cover layer and the rear side are made of heat-resistant glass. The construction is made of aluminum.

Tightness against driving rain: according to CEN/TR 15601



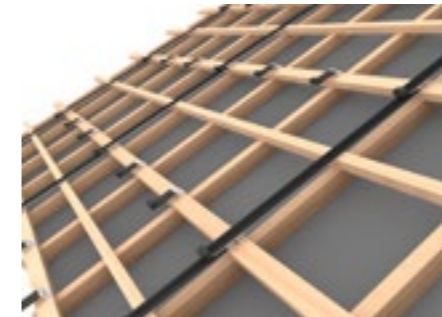
1 Roof battens 80 x 40 and 50 x 50 are fitted alternately in the grid.



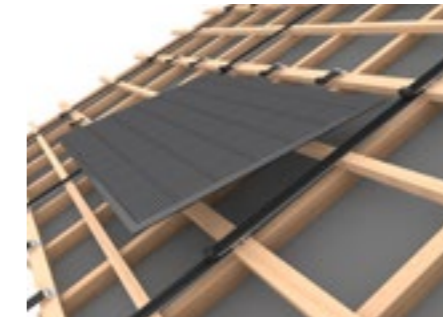
2 The rail hooks are mounted directly on the roof battens.



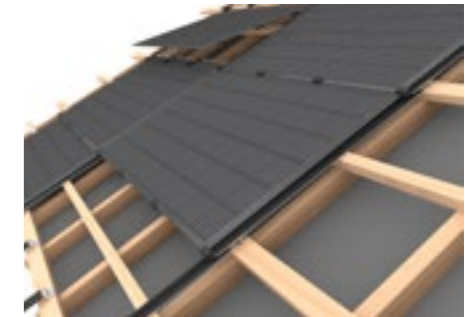
3 The support rails can be pushed easily into the rail hooks.



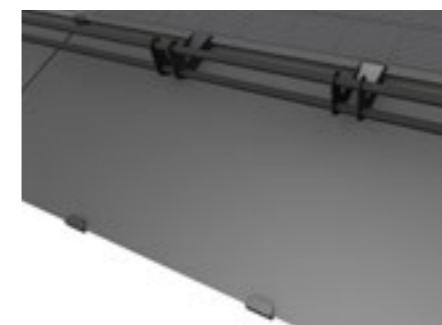
4 Central hooks provide additional stability.



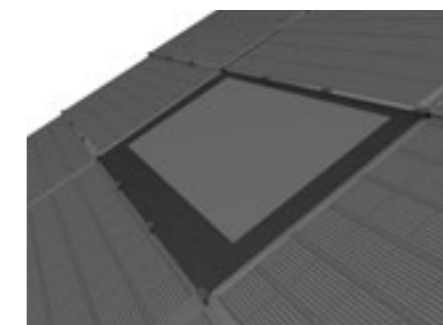
5 The solar modules can be pushed up from below and laid in.



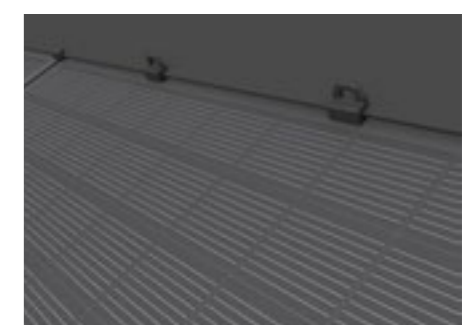
6 The roof-integrated system allows individual layouts.



Option: Snow guard

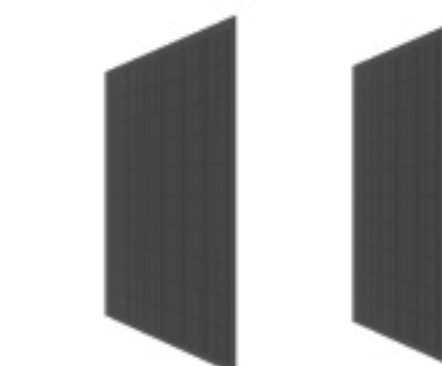


Option: Skylight



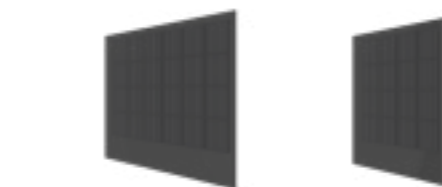
Option: Anchoring devices for personal protection

## Basic modules



6 x 10 cells

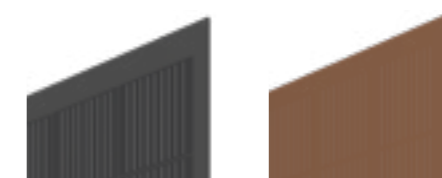
4 x 10 cells



6 x 4 cells

4 x 4 cells

## Colour variations

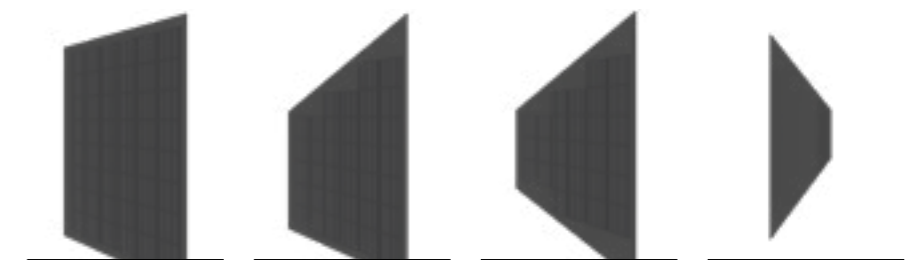


Full Black

Terracotta

Individual colours and glass surfaces can be freely designed according to SOLARCOLOR (solarcolor.ch). Design options are illustrated on pages 10 - 15.

## Special solar modules



Category 1  
Complexity: low  
*Adapted module length*

Category 2  
Complexity: medium  
*One side slanted, or adapted module height*

Category 3  
Complexity: high  
*Various modifications, two sides slanted, cut-outs, round shapes, holes*

Category 4  
Electrically passive  
Complexity: high



Video and technical documentation:  
[megasol.ch/en/level](https://megasol.ch/en/level)





▲ Powerful chalet roof in Hilterfingen | LEVEL roof-integrated system



▲ Apartment building in Waltenschwil | LEVEL roof-integrated system

# NICER X roof-integrated system

Flush-mounted solar roofing with highest cost efficiency.

## Areas of application

Typical areas of use for NICER are pitched roofs, roofings of any kind, wood and steel constructions. The most frequently used roof-integrated system in Switzerland is especially suitable for flat inclinations up to 3°.

## How it works

Vertical supports are applied to the roofing battens. The modules are placed into the vertical supports and closed similarly to a car boot door. The modules are fixed with a snap lock. Later dismantling is possible without restrictions.

## Flexibility

NICER solar modules are available as black, white and translucent versions. Half and quarter modules with a comparable appearance are among the standard components of the system. Translucent NICER systems are particularly suitable for carports, hangars, stadium roofs or pergolas and provide targeted shading and sun protection with simultaneous use of residual light.

## Compatibility

A skylight (Wenger Fenster) specially developed for the NICER roof-integrated system enables seamless integration. NICER can be equipped with an integrated snow guard.

## Type of installation

NICER modules are installed flush-mounted and floating (horizontally and vertically).

## Installation time

20 m<sup>2</sup> / man-hour (experienced installation personnel)

## Components

- > NICER solar modules
- > Vertical rail
- > Roof ridge profile
- > Covering panel and ventilation grid
- > *Snow guard (optional)*
- > *Wenger skylight (optional)*

## Sub-roof requirements

Canopy, carport, open warehouse, etc.  
(buildings that do not have to be completely water-proof in practice)

- > No sub-roof necessary

Residential buildings, office buildings, closed halls, etc.

- > Roof pitch above 13°: sub-roof for normal demands
- > 7° - 13°: sub-roof for increased demands
- > 3° - 6°: sub-roof for extraordinary demands
- > 0° - 3°: sub-roof with flat roof quality

Rail extensions and special modules can affect impermeability and must be verified individually.

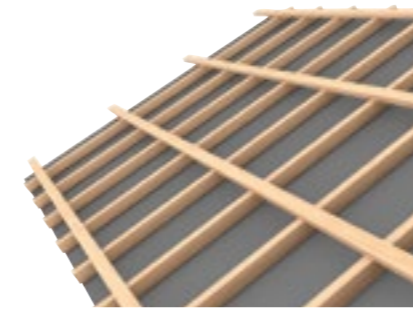
## Technical specifications

Solar module type: Framed glass-glass modules

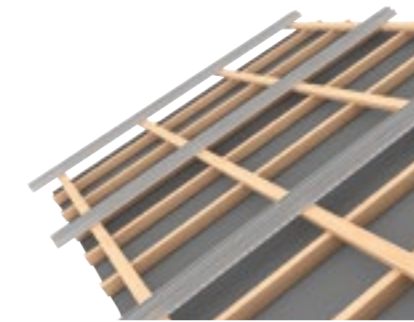
Grid dimension: 1740 x 1060 mm

Fire protection: B<sub>ROOF</sub>(t1) in accordance with DIN EN 13501-5 (hard roofing, abP), the top cover layer and the rear side are made of heat-resistant glass. The construction is made of aluminum.

Tightness against driving rain: according to CEN/TR 15601



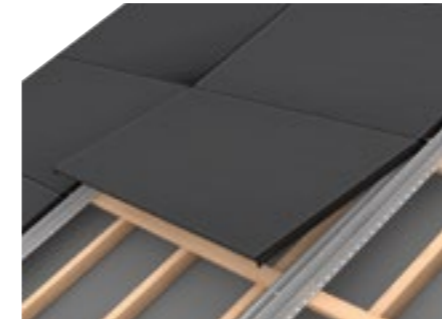
1 A steel or wood construction serves as the basis.



2 The NICER rails are laid out and screwed onto the roof battens.



3 The roof ridge profiles are then installed.



4 The individual solar modules can simply be clicked in...



5 ... and fastened.



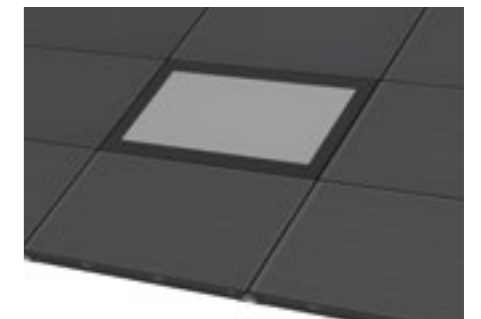
6 Install the covering plate and ventilation grid.



7 Completely installed, NICER is a water-proof roof covering.



Option: Snow guard

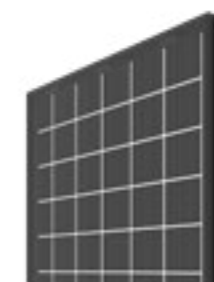


Option: Skylight

## Colour variations



Black



Translucent, increased cell spacing

## Basic module



6 x 10 cells

## NICER X – special features

### Improved aesthetics

- > Totally Black is the standard design (no visible contacts thanks to RearCon module technology)
- > No visible EPDM components

### New Snap-Lock mechanism

- > Visual feedback confirms that the solar modules are securely locked in place
- > The fastener can be opened and re-engaged several times

### Compact system

- > Overall construction height of only 100 mm
- > Simplified handling
- > The 3 mm protruding frame protects the double-glass laminate during installation



Video and technical documentation:  
[megasol.ch/en/nicer](https://megasol.ch/en/nicer)



▲ Speicherschwendi | NICER X roof-integrated system



▲ Hotel in Frutigen | NICER X roof-integrated system



▲ Residential building in Savognin (Swiss Alps) | MATCH Slate Creek Grey

# Expert consultation

Solar projects involve specific topics that required specific attention. A road map from the vision to implementation can contain the following milestones:

- 1 Gaining a shared understanding**  
The focus is on the vision and the planned appearance of the overall project. The first technical approaches are outlined. Preferences regarding interfaces and consultation services are discussed.
- 2 In-depth introduction**  
The doors of Megasol are open for partners. A production tour in Deitingen CH shows how the company works and where the integrated solar modules come from.
- 3 Rough concept**  
Guiding ideas flow into a rough concept and are formalized as system principles. It is possible to make substantiated statements about investment and profitability. The first samples follow.
- 4 Detailed concept**  
The design and the systems are worked out in detail and specified. Developments and formalities are carried out. Further samples follow and are approved.
- 5 Implementation**  
The solar modules are manufactured according to the agreed plans and designs. Support is ensured during the building phase and operation.

- Services**
- Project support:**
- > Consulting / training
  - > Detailed design options
  - > Grid layout
  - > Connection details / interfaces
  - > String / inverter dimensioning
  - > Support during implementation
- Formalities:**
- > EIV, ESTI, EEA
- Development:**
- > Design / colour
  - > Samples / mock-ups
  - > Customized mounting solutions
  - > Integration of storage solutions, energy management, charging infrastructure for e-mobility

# Values as a solid foundation

Responsible actions form the cornerstone of our company for 30 years. The aim is to create opportunities for others and therefore give back some of the success.

## Society

### Social commitment

Megasol is committed to ecological and social sustainability projects in economically disadvantaged regions – for example Solafrica's *Solar Learning* initiative and the Women's Solar Project Nicaragua. The commitment includes material supplies for specific projects or financial support, which benefit local vocational training and build up competent young talent in the solar sector.

### Corporate culture

The corporate culture is based on a high degree of trust in the employees. Room for creativity and self-responsibility are the sources of its innovative strength and the continual development of the company. In China, the remuneration exceeds the local standard in terms of benefit-oriented promotion. All employees are provided with further training and language courses. The implementation of Swiss safety and health standards at both sites is a question of entrepreneurial conscience.

## Environment

### Material and manufacturing

From the sourcing of raw materials to the completed solar module, manufacturing almost exclusively uses renewable energies. In Deitingen, the electricity necessary for the production is produced on site by means of a solar plant. The applied high-performance solar cells consist of high-purity silicon – free of cadmium, rare earths and heavy metals or other problematic substances.

### Recycling

The involvement with the Swiss foundation SENS and the European PV Cycle enables the reuse of almost 100% of the material used for Megasol solar modules.

### Electromobility

An own fleet of electric vehicles and free solar charging stations at the Deitingen production site reinforces the investment in future-orientated environmental technologies.

## Quality

### Awards

Every year, the market research institute EUPD Research identifies the most successful and strongest brands on the PV market. For the installers surveyed, Megasol ranks consistently among the most popular module manufacturers.

Megasol is an award-winning company. Many Swiss and European solar prizes and architectural awards testify to the trust that is placed in Megasol.

### Certifications

The manufacturing processes are TÜV-tested and run in accordance with EN/IEC and ANSI/UL standards.

### Traceability

Based on the individual serial number, all materials used for each solar module can be traced back to the raw material batch without any gaps.

### Testing steps

Each individual solar module undergoes a multitude of test steps. These include electroluminescence tests, flash tests and visual controls. The company has its own test centre. Tests such as Damp Heat, Shockfreeze, UV Lifetime, Dynamic Load, Thermocycle and Overpressure ensure the durability of the solar modules.

## Cooperation

### Cooperation with Saint-Gobain

Saint-Gobain, the world's largest manufacturer of building materials, invests in Megasol and holds a minority stake in the company. As part of the global distribution partnership with Saint-Gobain, Megasol is present in 76 countries.



### Manufacturing and research site

Forward-looking and regular investments in the production site in Deitingen as well as close cooperations with universities and technology partners set the relevant signals and help to strengthen Switzerland as a centre of research and industry.

## Politics

### Involvement

Despite enormous potential, photovoltaics require strong voices in politics. Through memberships in industry associations and interest groups, Megasol is involved in sustainable progress. The focus in everyday life is on concrete steps: appearances at conferences, provision of comprehensive information material for voting and guided tours for schools and political parties – also for those who are traditionally critical of environmental issues.



# Vision and vigour

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## Founder

Markus Gisler founded Megasol in 1993 in his youth. He directs the company as CEO and president of the administrative board. His vision led to the organic and continual development of Megasol Energy Ltd. The vision remains the driving force in everyday company life.



Markus Gisler, Founder and CEO

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## Vision

Solar modules by Megasol are intended as design material from which structures and pictures can be created. The integration of solar technology not only into buildings, but also into the living environment and consciousness of people, is the maxim.

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## Locations

The company consistently focuses on two locations. Development, administration and production are anchored in Deitingen, Switzerland. With a strong focus on customer proximity, individual design requirements can be met. Our factory in Ningbo, China, is specialized in large series and standard solutions.

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## Partnerships

The company has a wide network of architects, planning offices, investors, installers and operators. The company also fosters close partnerships with universities and both national and international research institutes.

**Megasol Energy Ltd.**

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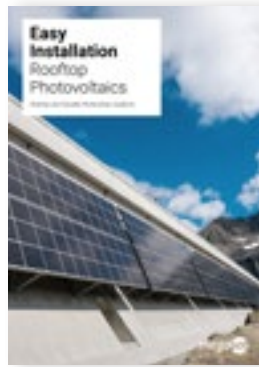
BIPV-EN-V9

Subject to errors and technical modifications

# Integrated Photovoltaics

**Easy Installation**

Rooftop Photovoltaics



**WingPort**

The smart Carport



**SOLARCOLOR**

Solar module design



▲ Brochures online

▲ All brochures are available in DE, EN, FR, IT.

▼ Cleantech Businesspark in Deitingen

