



25 years innovation in power

# Easy Installation

## Rooftop Photovoltaics

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Photovoltaic Systems

▼ Pilatus Aircraft Factory | 1.05 MWp | Swiss and European Solar Prize 2018





▲ Hörnli Hut at the foot of the Matterhorn | 3'260 metres above sea level | Image: Wikipedia

Image front page: Pilatus Aircraft Ltd.

# Vision and vigour

## Founder

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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 and remains the driving force in everyday company life.

## Vision

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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.

## Sites

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The company consistently focuses on two locations. Development, administration and production are anchored in Deitingen SO, Switzerland. With a strong focus on customer proximity, individual design requirements can be met. 70 employees work in Deitingen. 120 employees work at the site in Ningbo, China, which specializes in large series and standard solutions.

## Partnerships

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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.



Markus Gisler, Founder and CEO

# The Megasol principle

## **Successful as a team**

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We managed to retain the start-up spirit: We are young, fast, and incredibly innovative. Today, we are Europe's most successful manufacturer of solar modules. In this context, our customers are the decisive factor because close cooperation and team efforts are what makes the difference for success. We know and appreciate each other. With many of our customers, we are on first-name terms, and lots of them have become our friends. We appreciate frank and open feedback. Many of our product innovations result from exactly suchlike feedback. Our doors and hearts are open to our clients – whether we meet on-site, have raclette together at our Deitingen headquarters or enjoy a drink at one of our tradeshow appearances.

These are our principles:

# 1

### **Close contact to our customers, partners and friends**

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- > Direct contact to all stakeholders
- > Support for layout, sales, and implementation/realisation
- > Installation plans, ballasting plans, string plans
- > Formalities (EIV, ESTI, EEA)
- > On-site installation coaching
- > System trainings, e.g. for inverters

# 2

### **Fast and powerful systems**

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- > Systems with few components that are smartly designed
- > In-house developments focused on short installation times and maximum performance

# 3

### **Everything from a single source**

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- > Solar modules (glass-film / glass-glass), mounting structures, inverters, generator connection boxes, electric materials
- > Quick provision through our in-house logistics and processing centre
- > Turn-key delivery to the construction site



▲ Hörnli Hut at the foot of the Matterhorn | 3'260 metres above sea level | Image: Solarbau Lowel GmbH

# Think big, start small

## **Factory in Deitingen, Switzerland**

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Development, production, sales, logistics and administration are located at our Deitingen headquarters. The heart of the site is the high-tech production facility, which specializes in medium-sized series and custom-made products. Our logistics centre is the largest warehouse for solar modules in Switzerland.

- > Annual capacity of 80 megawatts
- > 70 employees
- > Fully automatic production line for glass-glass solar modules
- > Industrial production of special modules in individual sizes and colours
- > Customized mounting solutions

## **Sustainable production**

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From raw material extraction to the finished solar module, only renewable energies are used in the production process.

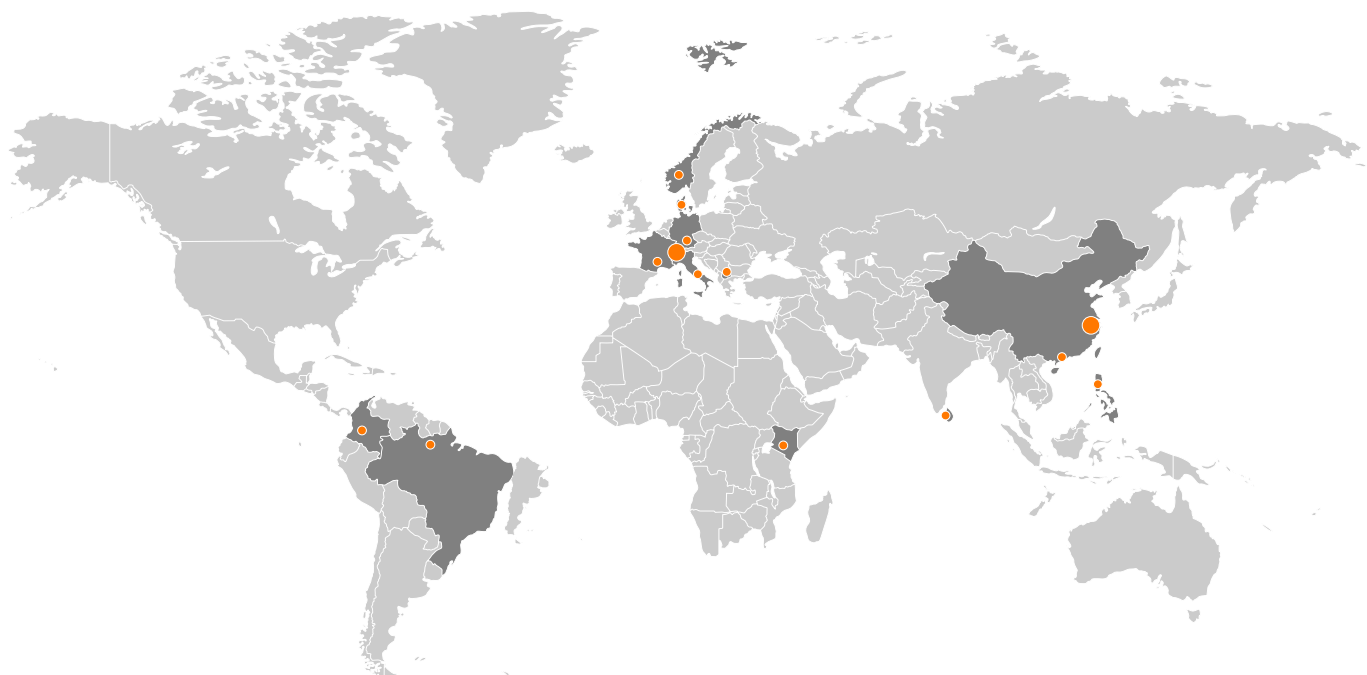
In Deitingen, the electricity required for production is generated on site using our own solar plant. Excess energy is fed into the grid more than 250 days a year.

- > 1'000 MWh power consumption
- > 1.2 MWp PV plant capacity
- > 114% net self-sufficiency

## **Worldwide distribution network**

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Megasol can count on reliable partners and distributors worldwide: Germany, France, Italy, Denmark, Norway, Kosovo, Kenya, Brazil, Colombia, Sri Lanka, Hong Kong, Philippines.



### **Smart logistics**

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From individual spare parts to complete solar systems – hundreds of modules and components leave our Deitingen site every day. Thanks to our storage capacities that provide for up to 40'000 modules and 3'500 different items that are permanently available, we are highly flexible. Our partly-automated processing centre is responsible for customization and assembly processes. These are followed by commissioned delivery to the respective site. Our efficient logistics include warehouses in Ningbo (CN), Rotterdam (NL), and Deitingen (CH) and enables us to serve international markets as well.

### **Factory in Ningbo, China**

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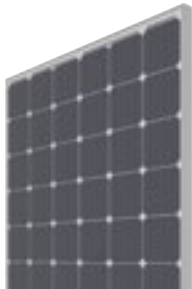

Our second plant is located in Ningbo, a coastal city in the eastern Chinese province of Zhejiang.

- > Annual capacity of 130 megawatts
- > 120 employees, including 25 in research, development and quality assurance
- > Fully automatic production line for standard high-performance modules
- > Seamless material traceability and quality assurance
- > Swiss warranty conditions

# Solar modules


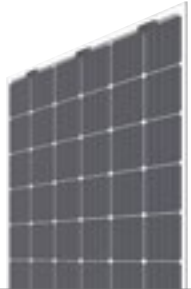
## Glass-film modules

10

Properties	Structure						
<ul style="list-style-type: none"><li>&gt; Best price-performance ratio</li><li>&gt; U-frame or CleanFrame</li><li>&gt; Swiss warranty</li><li>&gt; Mono- and polycrystalline cells</li><li>&gt; Ex stock Deitingen</li></ul>	<table><tr><td>Module types</td><td>12</td></tr><tr><td>LOCKUP module fixation</td><td>14</td></tr><tr><td>LOCKUP components</td><td>16</td></tr></table>	Module types	12	LOCKUP module fixation	14	LOCKUP components	16
Module types	12						
LOCKUP module fixation	14						
LOCKUP components	16						
	<div><div><p>Monocrystalline, white, U40</p></div><div><p>Monocrystalline, black, CF3</p></div></div>						

## Glass-glass modules

20

Properties	Structure						
<ul style="list-style-type: none"><li>&gt; <i>Swiss Made</i></li><li>&gt; Highest longevity</li><li>&gt; Strongest performance</li><li>&gt; High static load resistance</li><li>&gt; Bifacial or monofacial</li><li>&gt; Frameless</li></ul>	<table><tr><td>Module types</td><td>22</td></tr><tr><td>LAYUP module fixation</td><td>24</td></tr><tr><td>LAYUP components</td><td>26</td></tr></table>	Module types	22	LAYUP module fixation	24	LAYUP components	26
Module types	22						
LAYUP module fixation	24						
LAYUP components	26						
	<div><div><p>Black</p></div><div><p>Bifacial</p></div></div>						

# Roof connection

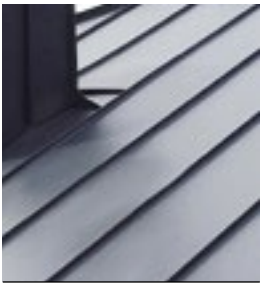
## Pitched roof

28

### Recommendation

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- > Solid and proven systems
- > Simple and efficient installation
- > All roof coverings: tile, sheet metal, fibre cement etc.



Seam metal roof



Fibre cement roof

## Flat roof

30

### Recommendation

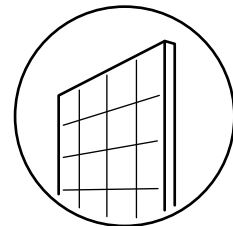
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- > High-speed installation
- > Flatport Advanced: only 3 components
- > Prevents roof membrane from damage
- > Simple ballasting
- > Ballasting plans

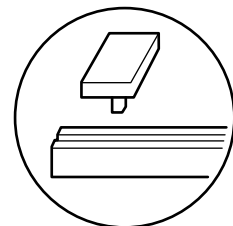
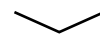


Flatport tray

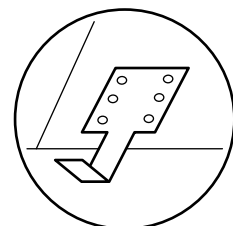
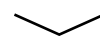
## Structure



Module



Fixation



Roof connection

# Glass-film modules

Quick to install, budget-friendly, and highly profitable: our glass-film modules are extraordinarily durable "workaholics".

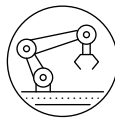
**Low investment**

- > Best market prices
- > Project prices on request



**Latest technology**

- > 5-busbar technology
- > Nano-coated solar glass
- > Optimized low-light performance



**Secure fixation**

- > LOCKUP module fixation 14

**Smart frames**

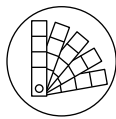
- > U40 frame 12
- > CleanFrame 3 13



### Wide product range

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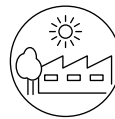
- > Power classes (280 - 315 Wp)
- > Optics (black / white)
- > Cells (mono- / polycrystalline)



### Environmentally friendly

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- > Made with renewable power
- > Energetic amortisation under 2 years
- > Seamless traceability of all materials



### Swiss warranty

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- > 25 years linear performance warranty
- > 10 years product warranty
- > Produced at the Megasol plant in Ningbo

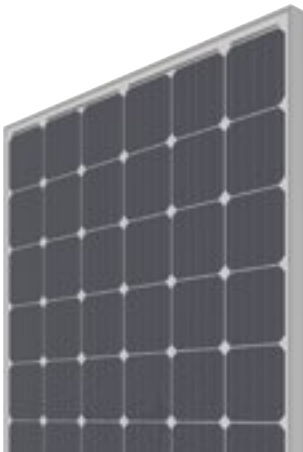


Framed module | 12

LOCKUP fixation | 16

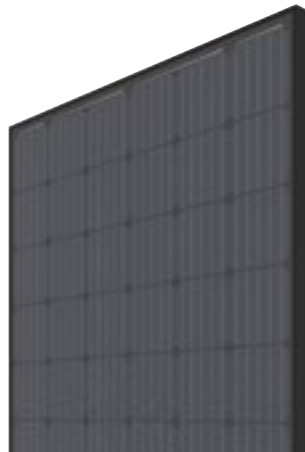
# Module types

## U40 frame



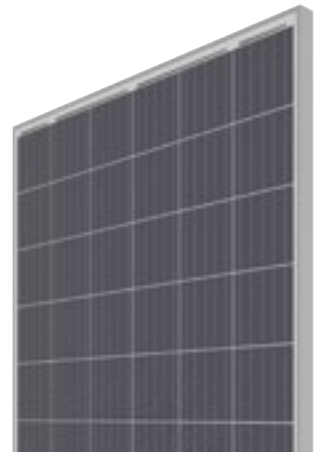
**Monocrystalline, white, 315 Wp**

0322.0866 High-performance module  
M315-60-w U40



**Monocrystalline, black, 310 Wp**

0322.0867 High-performance module  
M310-60-b U40b



**Polycrystalline, white, 280 Wp**

0322.0821 High-performance module  
P280-60-w U40

### Technical specifications

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Laminate structure: Glass-film

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Cell type: Mono / mono PERC / poly, 5 busbars, 6x10 cells

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Cell size: 156 x 156 mm

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Frame: U-frame 40 mm, aluminium, anodized natural or black

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Front side: 3.2 mm solar glass, high-transmission,  
tempered / toughened, nano-finished / antireflective surface

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Back side: Three-layer build-up (polyester / PET / tedlar)

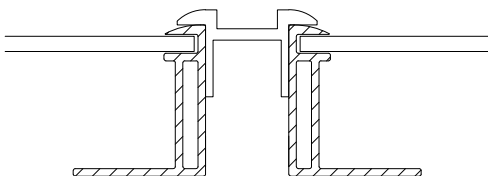
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Dimensions (L x W x H): 1640 x 992 x 40 mm

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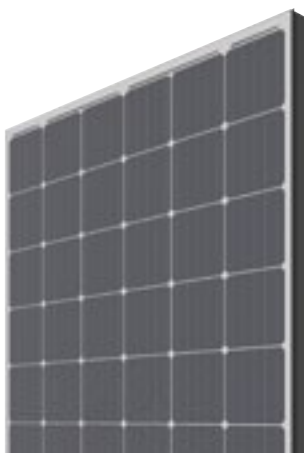
Weight: 18.5 kg

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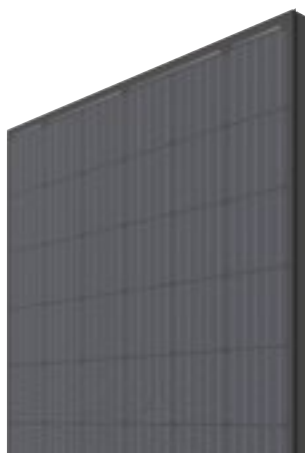
Cross section of the U40 module with standard module clamp

# CleanFrame 3



**Monocrystalline, white, 315 Wp**

0322.1441 High-performance module  
M315-60-w CF3



**Monocrystalline, black, 310 Wp**

0322.1442 High-performance module  
M310-60-b CF3

## Technical specifications

Laminate structure: Glass-film

Cell type: Mono / mono PERC, 5 busbars, 6x10 cells

Cell size: 156 x 156 mm

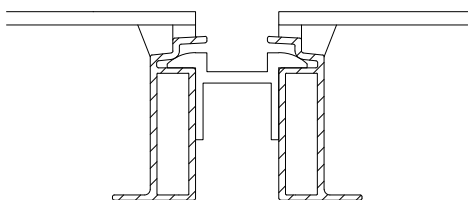
Frame: CleanFrame 3, aluminium, anodized black

Front side: 3.2 mm solar glass, high-transmission,  
tempered / toughened, nano-finished / antireflective surface

Back side: Three-layer build-up (polyester / PET / tedlar)

Dimensions (L x W x H): 1640 x 992 x 50 mm

Weight: 19 kg



Cross section of the CleanFrame module with standard module clamp

## Low-pitched roof? CleanFrame 3!

CleanFrame is a frame that does not protrude the glass (the glass is mounted onto the frame), which allows dirt and snow to run off freely. This facilitates natural self-cleaning (the so-called CleanFrame effect) that yields a surplus of up to 20%.

This is the perfect solution for flat roofs or low-pitched roofs. CleanFrame means a higher energy yield at less service costs.

## The upgrade (CleanFrame 2 becomes CleanFrame 3)

- > Future ready: same modular dimensions for larger glass surfaces (compatibility remains, even with larger cells in the future)
- > Even better CleanFrame effect
- > Siliconisation is now underneath the glass and therefore invisible

# LOCKUP module fixation

The fixation system for high-performance modules (U40 frame and CleanFrame) that is fully compatible with components of leading manufacturers.

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## Two components

- > Clamp
- > Rail

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## Simple connection

- > Fastening to roof connection by means of screws or cross connectors



### Secure fixation

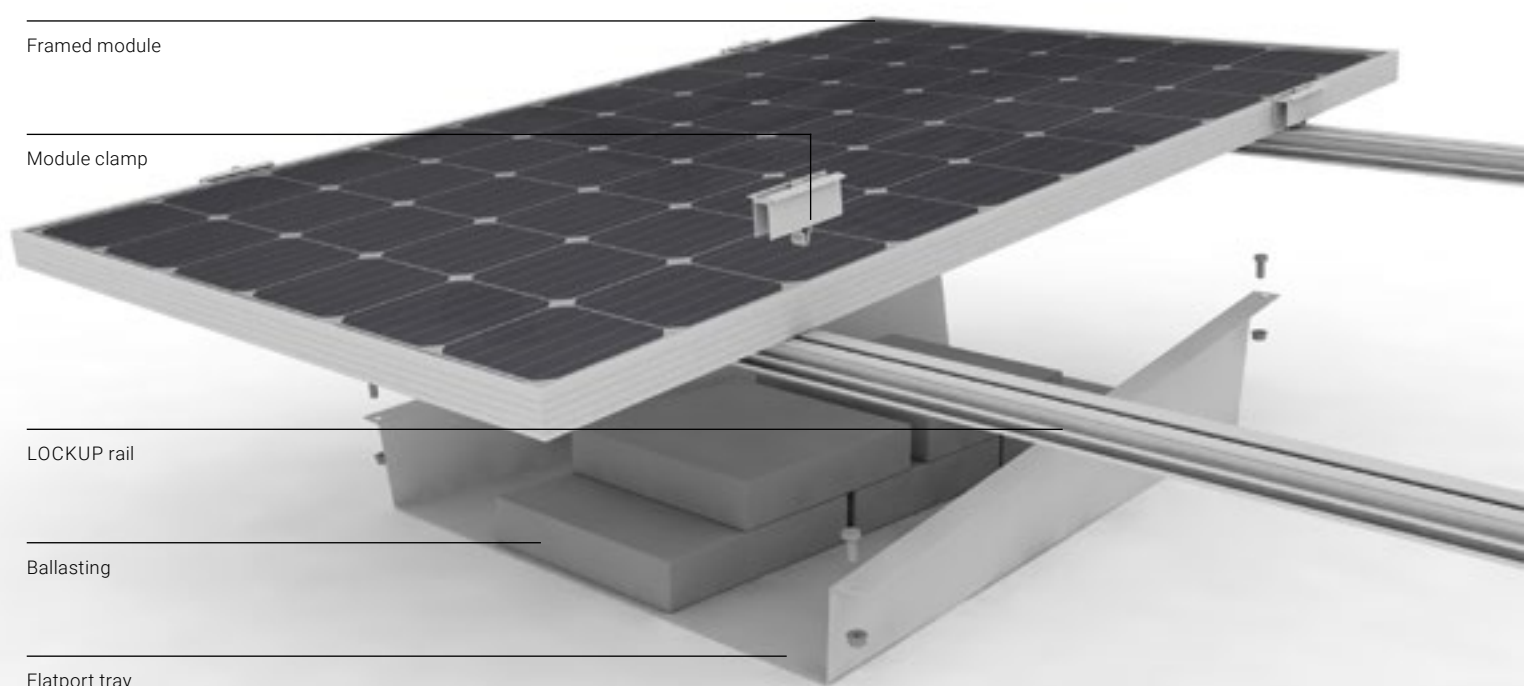
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- > Click in
- > Tighten with screwdriver

### High compatibility

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- > U-frame and CleanFrame
- > Pitched roof and flat roof
- > Compatible with all roof connections from Megasol, Schletter and K2



# LOCKUP components

## Rails



3337.0330  
LOCKUP rail



3337.0331  
LOCKUP connector



3231.0225  
Solo Light rail 6.2m



3231.0113  
Solo / Profi  
connector kit



3231.0115  
Pre-assembled  
E connector

## Clamps



3231.0216  
Module end clamp  
Rapid16, 30-40mm  
silver



3231.0217  
Module end clamp  
Rapid16, 30-40 mm  
black



3231.0211  
Module middle clamp  
Rapid16, 30-40mm  
silver



3231.0212  
Module middle clamp  
Rapid16, 30-40 mm  
black



3231.0128  
Rapid cross connector



▲ Gefco Carport Courgenay | 43'000 m<sup>2</sup> | 6.84 MWp



▲ Riverside Business Park Zuchwil | 36'000 m<sup>2</sup> | 5.76 MWp | Swiss Solar Prize 2016



# Glass-glass modules

They generate up to 403 Wp. With a service life of over 50 years our *Swiss Made* glass-glass solar modules are particularly interesting for institutional investors.

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## Swiss quality

- > 35 years linear performance warranty
- > 10 years product warranty
- > Made in Deitingen, Switzerland



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## Profitable investments

- > Service life of more than 50 years
- > Highest yields
- > Lowest watt price per warranty year



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## Sustainable production

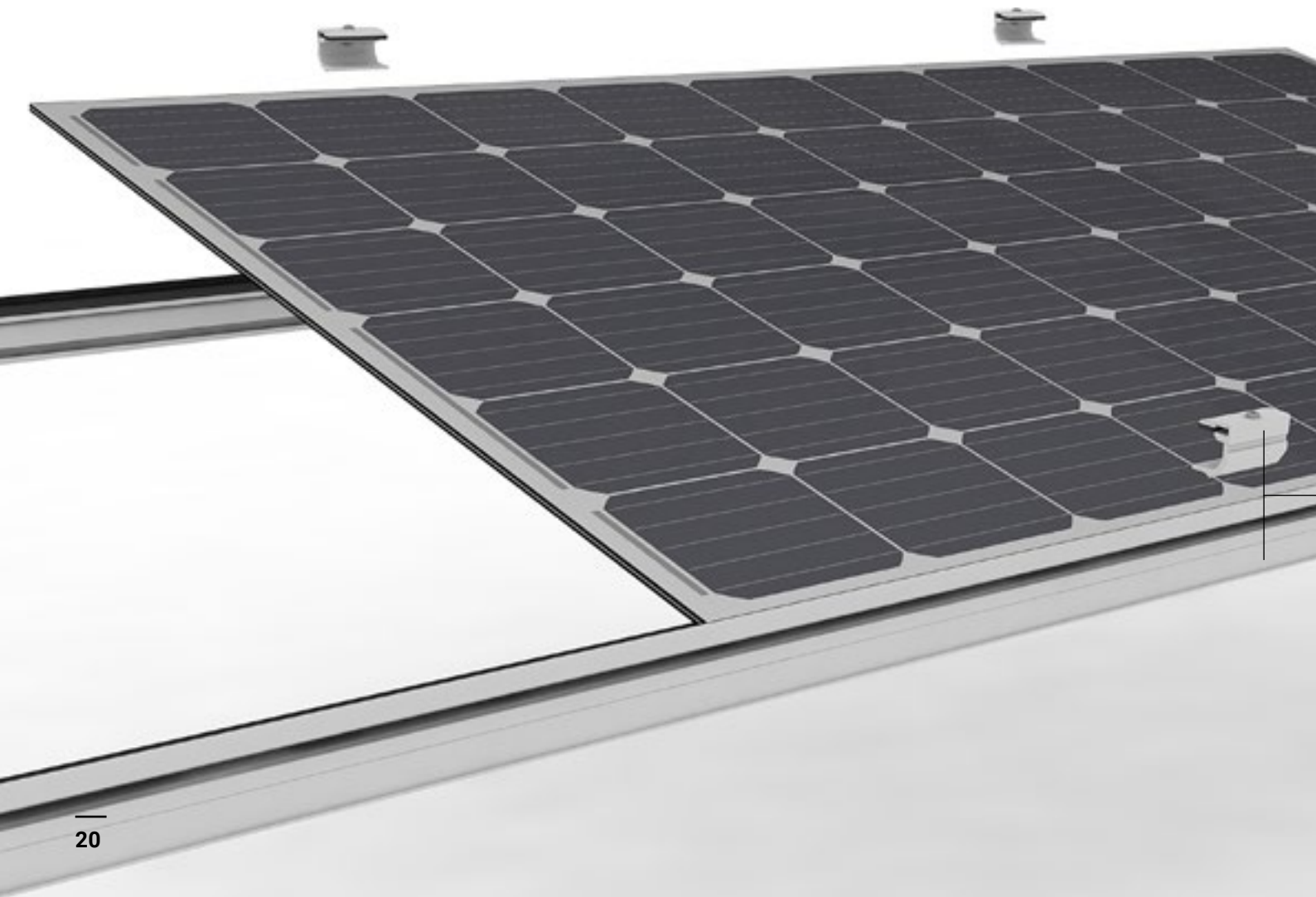
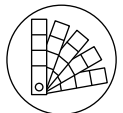
- > Made with renewable power sources
- > Energetic amortisation under 2 years
- > Seamless traceability of all materials



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## Wide range of applications

- > Monofacial and bifacial cells
- > Power classes: 310 - 403 Wp
- > Optics: black / white / translucent



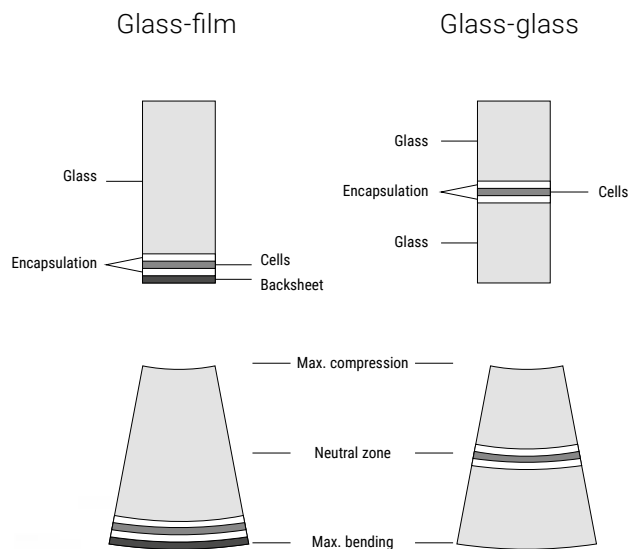
## LAYUP fixation

- > Fast and easy
- > CleanFrame effect
- > Module clamps do not cover cells
- > Extremely robust thanks to large contact surface



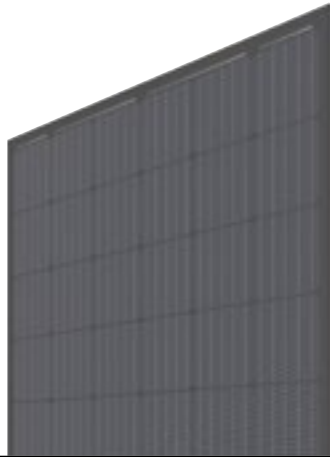
## Outstanding stability

- > Laminated safety glass (two laminated glasses)
- > "Neutral zone" protects against microcracks
- > Front and rear glass prevent steam penetration



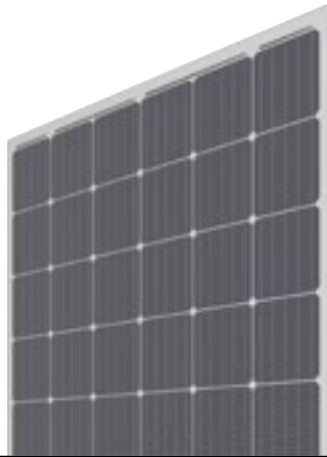
Frameless glass-glass module | 22

# Module types



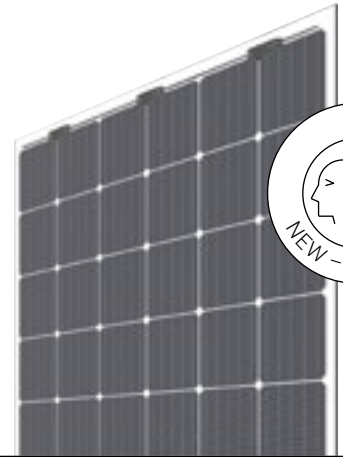
**Black, 310 Wp**

0322.1316 Swiss Premium  
M310-60-b GG2



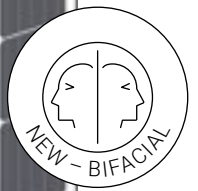
**White, 315 Wp**

0322.1324 Swiss Premium  
M315-60-w GG2



**Bifacial, 403 Wp**

0322.1149 Swiss Premium  
M403-60-t BF GG2



## Technical specifications

Cell type: Mono / mono PERC / bifacial

Cell size: 156.75 x 156.75 mm

Frame: Frameless

Encapsulation material: EVA or PVB

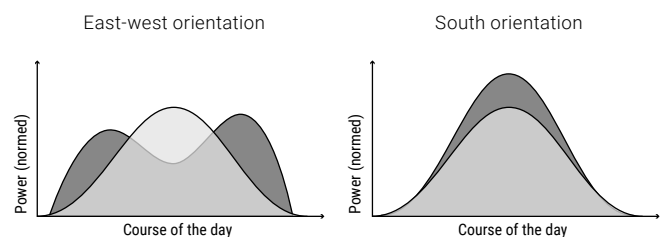
Glass thickness per pane: 2 - 12 mm

Hail resistance: Hail protection class 4 or 5

Fire protection: Top and back layer are made of heat-resistant glass. The component is considered to be non-combustible material as defined by the Cantonal Fire Insurances.

## Bifacial: power from reflections

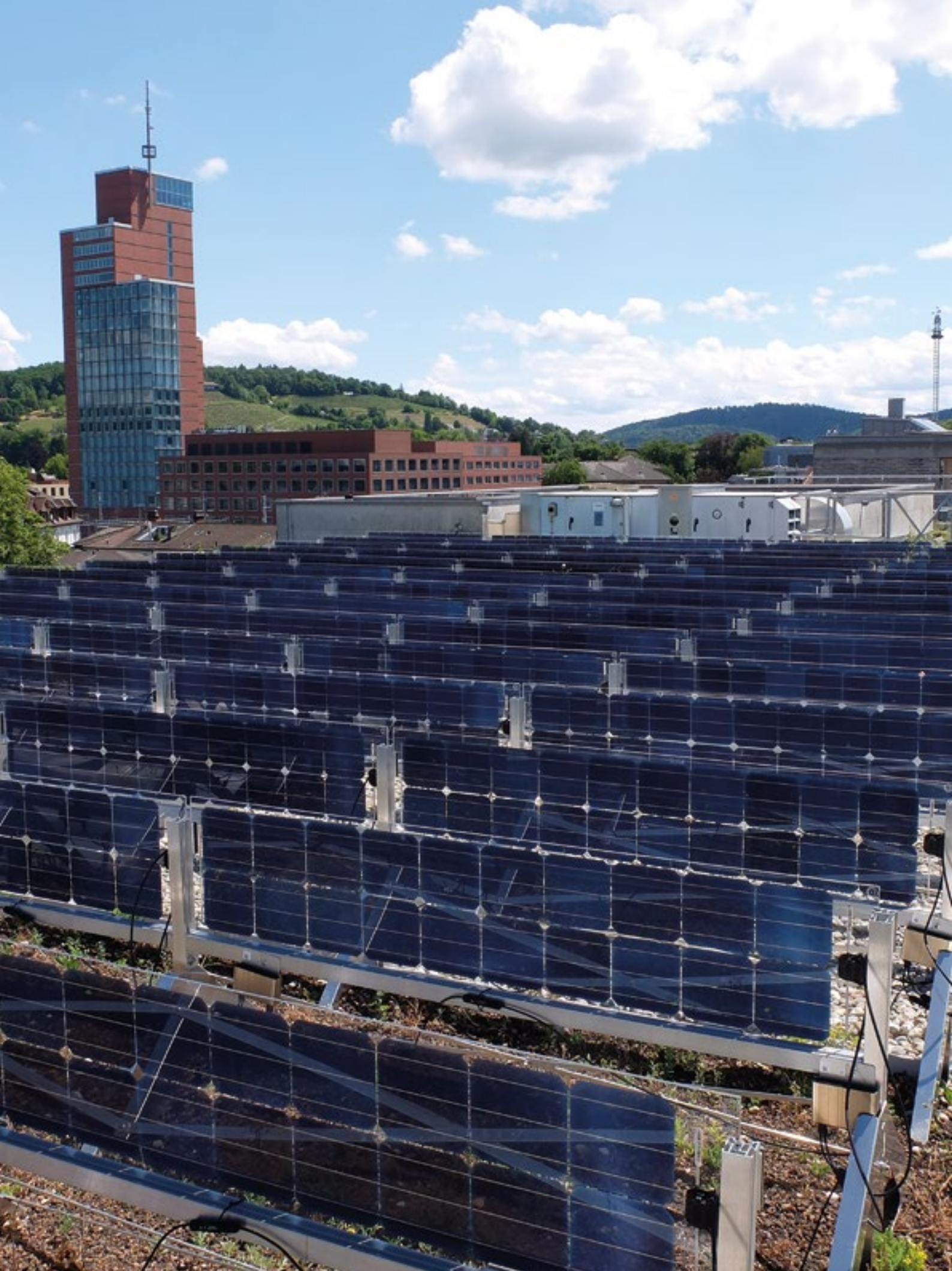
- > Double sided active cells
- > Available for all translucent glass-glass modules
- > Additional yields depend on the installation situation and the albedo (reflectivity) of the substrate



In east-west orientations, the rear produces most when the sun is flat. South facing bifacial plants generate their additional yield classically during the midday hours.

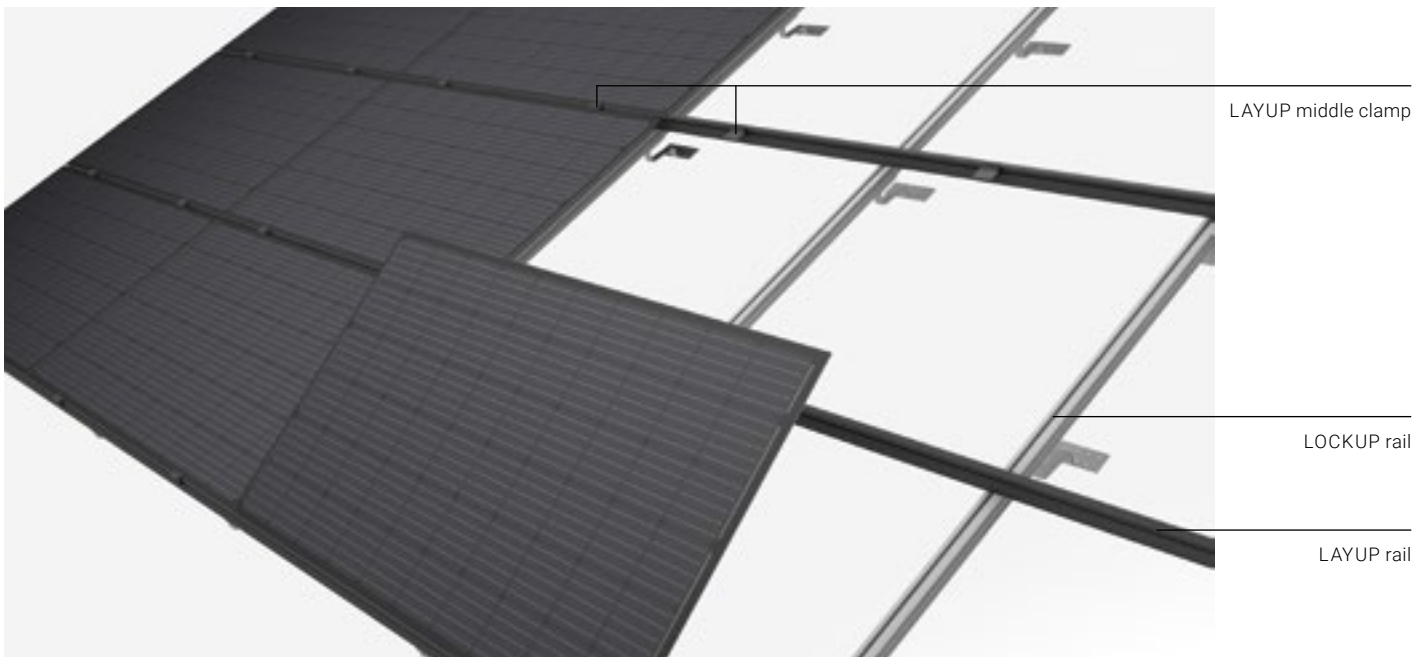
## Potential bifacial gain

Low reflecting surface (e.g. grass, brick)	5-15%
Well reflecting surface (e.g. sand, bright gravel or paint)	15-25%
Highly reflecting surface (e.g. ice, snow)	25-35%

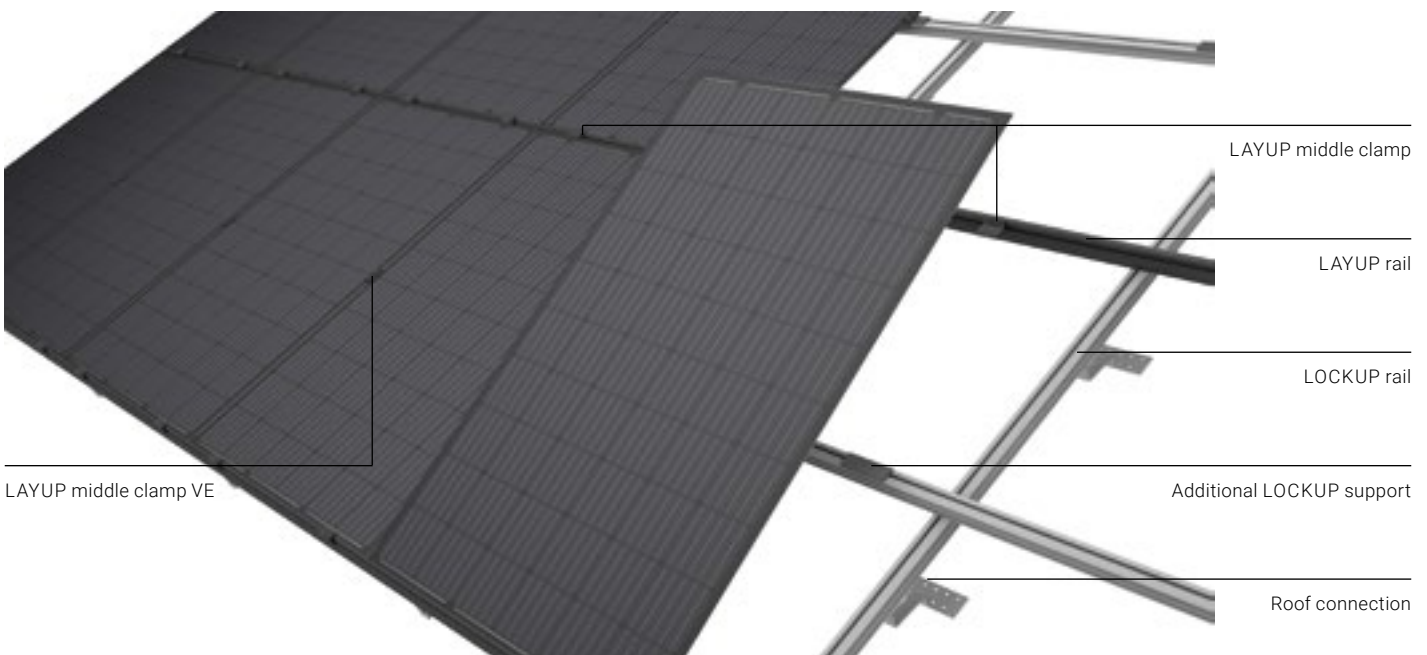


# LAYUP fixation

The mounting system for glass-glass modules (monofacial or bifacial) that is fully compatible with components of leading manufacturers.



**Landscape:** horizontal installation



**Portrait:** vertical installation

### Versatile application

- > Monofacial or bifacial glass-glass modules
- > Pitched roof, flat roof and facade
- > Compatible with all roof connection points from Megasol, Schletter and K2

### Elegant look

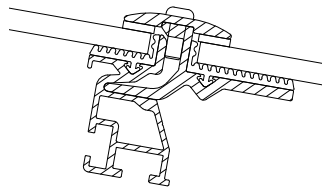
- > Flush-mounted installation
- > Without protruding frames (CleanFrame effect)

### Three components

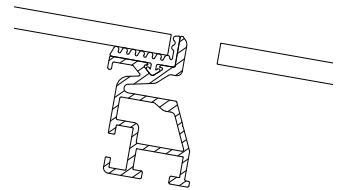
- > LAYUP rail (black / classic aluminium)
- > LAYUP clamps (black / classic aluminium)
- > Cross connector or screw

### Secure fixation

- > Connection with screws or cross connectors
- > Placed on the rail and secured with clamps
- > High stability thanks to large contact surface



Cross section through clamp



Cross section next to clamp

LAYUP end clamp

LAYUP rail

Flatport tray

M10 screw

M10 flange nut



# LAYUP components

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## Rails



3337.0300  
LAYUP rail  
6560mm silver



3337.0315  
LAYUP rail  
6560mm black



3337.0310  
LAYUP rail connector  
kit with screws

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## Clamps



3337.0314  
LAYUP middle clamp  
kit silver



3337.0308  
LAYUP middle clamp  
kit black



3337.0309  
LAYUP end clamp  
silver



3337.0301  
LAYUP end clamp  
black



3337.0306  
LAYUP spacer 5mm  
black

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## Additional components (for portrait installation)



3337.0330  
LOCKUP rail



3337.0332  
LOCKUP support



3337.0341  
LAYUP middle clamp  
VE silver



3337.0342  
LAYUP middle clamp  
VE black



# Pitched roofs

The well-elaborate connection points for pitched roofs can be perfectly combined with LOCKUP and LAYUP module fixations.

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## Wide range of applications

- > The right solution for every roof covering
- > For different static load requirements

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## Simple combination

- > Compatible with LOCKUP and LAYUP module fixations
- > Cross connectors or screws



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Sheet adapter

## Components



Classic tile



Seam metal



Trapezoidal sheet



Corrugated roof



3231.0029  
Roof hook Rapid2+ Max



3333.0046  
Clamp 504 AL KK for seam metal



3337.0328  
Sheet adapter



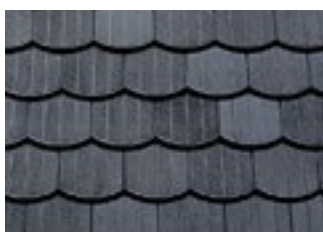
3231.0179  
Fixation kit for corrugated roof  
M12x300 KlickTop



3231.0036  
Roof hook Rapid2+ MaxV



3337.0329  
Stopper



Plain tile



Fibre cement



Prefa



3231.0024  
Fixation kit for plain tile



3231.0010  
Roof hook for fibre cement/Prefa

# Flat roof

The easy-to-mount *Flatport* trays for flat roofs are the ideal base for LOCKUP and LAYUP module fixations.

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## Quick and gentle installation

- > Upside-down procedure
- > No punctual load on the roof membrane

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## All flat roof coverings

- > Gravel / granulate
- > Vegetated / bitumen

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## Simple ballasting

- > Gravel or slabs
- > Ballasting plan on request

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## High longevity

- > Corrosion resistant alloy
- > 10 years material warranty



**1** Place the LOCKUP rail on Megasol trestles and insert M10x25 hexagon screws into the rail.

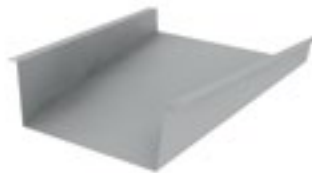


**2** Place the Flatport trays upside down on the rails and tighten them with M10 flange nuts.

### Simple combination

- > Compatible with LOCKUP and LAYUP module fixations
- > Quick fastening with screws

### Components



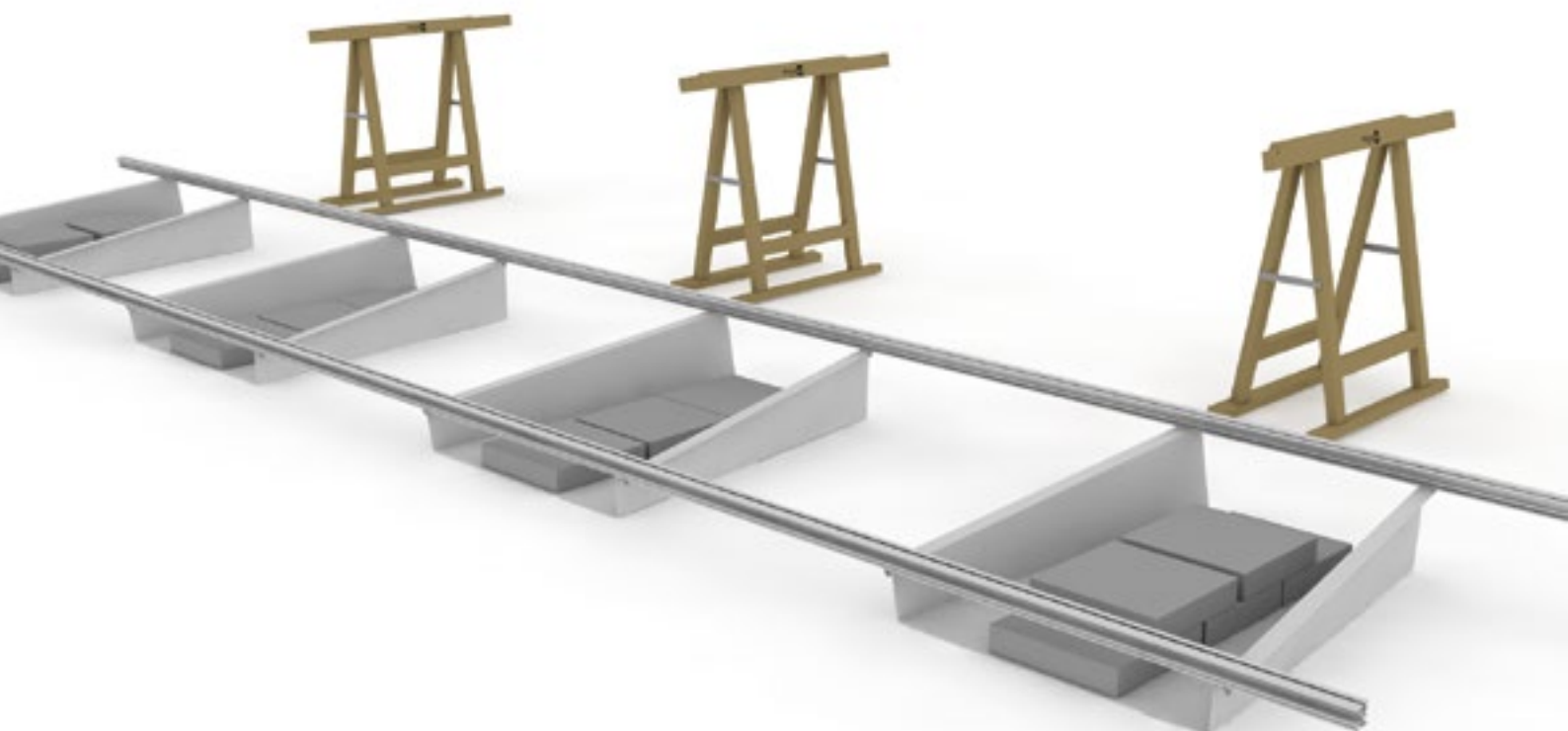
3337.0175  
Flatport Advanced 6° 997.5



3231.0130  
Hexagon screw M10x25



3231.0040 Flange nut M10  
with locking teeth



**3** Turn the trays over with the rails, align them on the surface and ballast them.

# Made in Deitingen



## Development

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We are committed to technological leadership in the field of all-in-one systems. Following this principle, we continuously drive the development forward. Megasol solar modules and mounting systems as well as our production processes are constantly analyzed and optimized. Our engineers, programmers and electrotechnicians closely cooperate to design and develop new products and the processes required to manufacture them.

Our test and research centre in Deitingen, Switzerland pools the entire expertise from planners and installers and shapes the development and advancement of new and existing products.

## Optimizing performance

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The nano-coated antireflective solar glass used for all products conducts the maximum amount of sunlight to the solar cells. Thanks to state-of-the-art spectral optimization, Megasol solar modules perform up to 15% better than customary modules under cloudy conditions and during dusk or dawn.

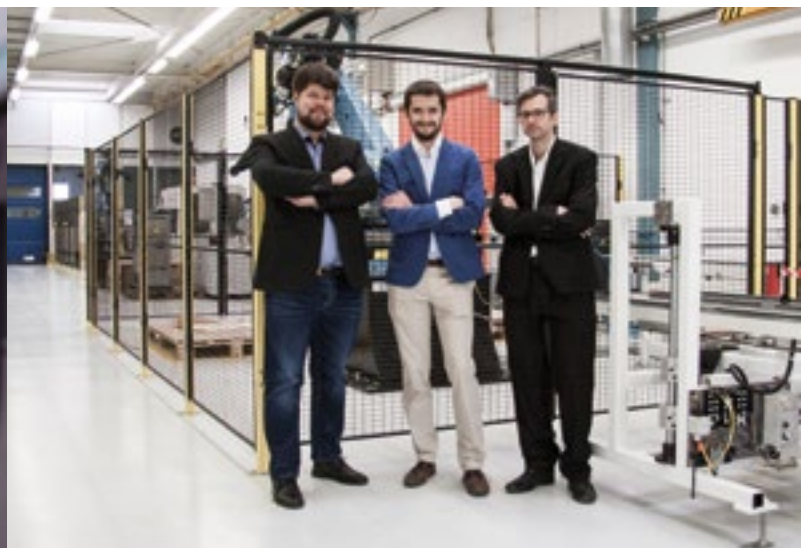
## In-house test centre

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Especially in high alpine environments, extreme heat or cold and the impact of snow and wind are particularly challenging for solar modules. The standard IEC test procedures do not account for these conditions.

Our test procedures are different – they exceed industry standards by far. An example: The IEC requires damp heat test procedures to cover 1'000 hours. Megasol increases this value by a factor of 10 to 10'000 hours.

At our Deitingen production site, we test: Damp-heat, shock freeze, UV lifetime, dynamic load and thermal cycle. Only top-quality materials that pass all tests without reservation are used to produce Megasol modules.



### **In-line testing**

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One production line is designed for medium-sized series, while the other is used to manufacture modules in a customer-specific design. Starting with precise controls of all semi-finished products, each step in the manufacturing process is subject to several controls. Electroluminescence tests (3 times) as well as technical and optical controls accompany the entire manufacturing process up to the final flash test.

### **Traceability**

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All data from production can be viewed electronically at any time. This also includes information on the materials used, which can be traced back seamlessly to the raw material batch. Our high-performance solar cells consist of high-purity silicon – free of cadmium, rare earths and heavy metals.

### **Recycling**

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Our commitment with the Swiss foundation SENS and the European PV Cycle enables the reuse of almost 100% of the used material.

### **Certifications and awards**

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

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

### **Support services**

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#### **Consultation**

- > Detailed design options
- > Grid layout
- > Connection details / interfaces
- > String / inverter dimensioning
- > Tenders

#### **Formalities**

- > EIV, ESTI, EEA

#### **Development**

- > Colour development
- > Samples / mock-ups
- > Product development (special solar modules / substructures)

# Values and cornerstones

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

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## 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 in 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.

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## 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.

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## Corporate culture

Our 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.

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## Political commitment

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.



**Megasol Energy Ltd.**

Industriestrasse 3  
4543 Deitingen  
Switzerland

+41 62 919 90 90  
info@megasol.ch  
www.megasol.ch

▼ Cleantech Businesspark in Deitingen

