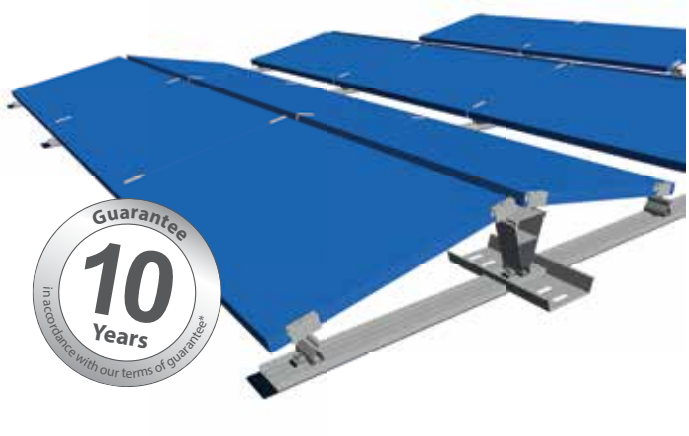
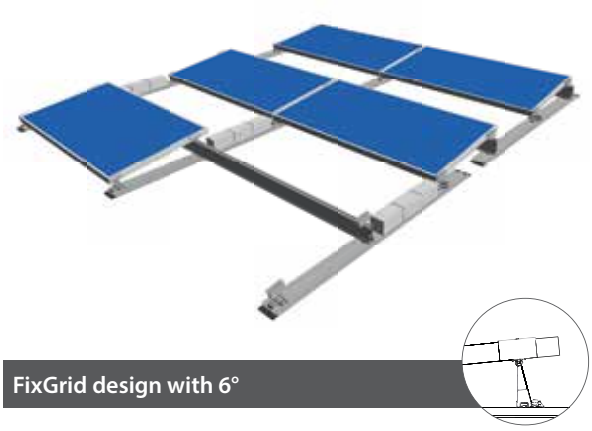
FixGrid

The inclined solar fastening system for flat roofs with German general technical approval



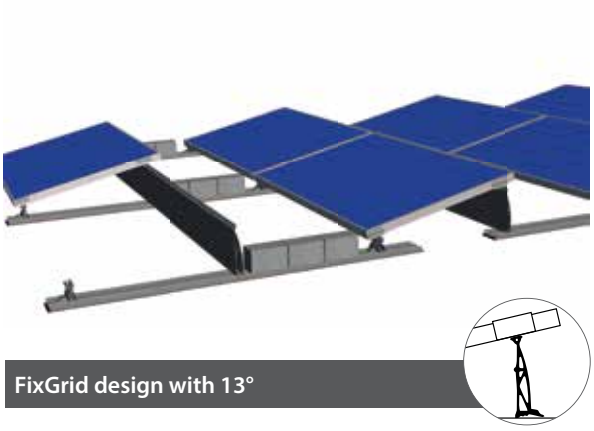
- Inclination angle of 6° or 13°
- Optimized regarding wind loads, only little superimposed load required
- No perforation of the roof
- For flat roofs
- Optimized regarding material and cost
- General technical approval according to Z-14.4-639 and Z-14.4-631

The latest generation for flat roof solar plants of any desired size. With FixGrid, Schletter provides a system optimized in both material and tool requirements, the solar modules are arranged in closed rows with a fixed inclination angle of 6 or 13 degrees. Only minimal superimposed loads are required. The components are interconnected using the Standard Schletter Klick system. The maximum admissible roof inclination is 3°. A mechanical anti-slide protection is generally recommended for pitched roofs. The mounting is carried out with only one tool (power screwdriver with size 6 socket) when Schletter Standard module clamps are used. The superimposed load can be put in load trays (optional) or can be put onto the base rail (profile). An additional fastening of the mounting systems that would perforate the roof cladding is not required.



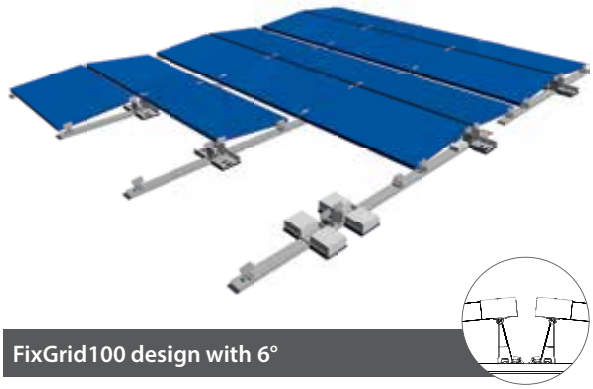
FixGrid design with 6°

Simple alignment (for example to the south),
Inclination: about 6°



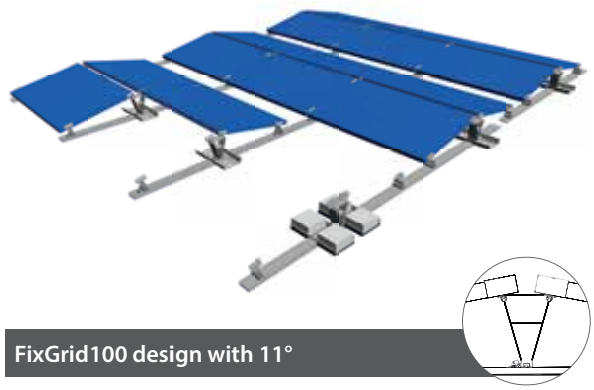
FixGrid design with 13°

Simple alignment (for example to the south),
Inclination: about 13°



FixGrid100 design with 6°

Two-sided alignment (for example east - west),
Inclination: about 6° to make the best use of the roof area



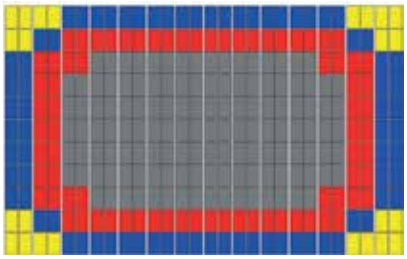
FixGrid100 design with 11°

Two-sided alignment (for example east - west),
Inclination: about 11° to make the best use of the roof area

*The terms of guarantee are available at www.schletter.de/AGB_en

Structural analysis

Example: Roof layout plan
Alignment to one side (for example to the south)



Example: Roof layout plan
Alignment to two sides (e.g. east-west)

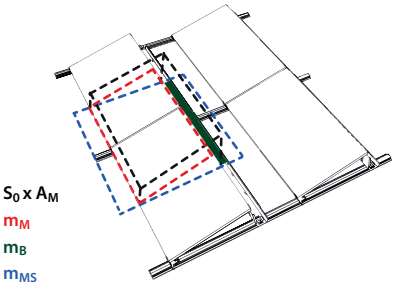
Information regarding the limitation of the module field dimensions

Variance in linear thermal expansion coefficients of the mounting system as compared to those of the roof cladding can result in stress and strain on the roof cladding when there are temperature changes. Depending on the roof covering of the respective building, the maximum module field dimensions should be limited to avoid damage to the roof cladding. On concrete roofs, module field dimensions of about 20 to 30 meters are feasible. In order to avoid mechanical stress on roofs with membrane coverings, we recommend a maximum module field size of not more than 10 m in this case as well as a surface protection mat or system that is compatible with the roof covering. When module fields are separated, it must be made sure that the module field on pitched roofs are connected flexibly and that lightning protection or potential equalization connections that may be required are also flexible.

Information about surface pressure and uniformly distributed load

The uniform distributed load is the load which is distributed evenly across the roof structure. As well as the local snow and wind loads that have an impact on the roof area, anyway, the surface load calculation must also include the additional load of photovoltaic modules, mounting racks and, if applicable, of ballast material. But this is a completely different thing than partial surface pressure that is transferred into the roof structure at individual spots by supports or rails (profiles). Pressure imposed on a small area is called partial surface pressure.

Areas of surface pressure can be accommodated in different ways depending on the roof sealing methods and on the type of substructure. There usually is no problem in this respect when there are hard subsurface materials e.g. wood or concrete beneath the waterproof membrane, but if there is a particularly soft insulation, the maximum permissible partial contact pressure may be exceeded. The customer is responsible for checking that this value remains within the permissible range. This can be done as follows:

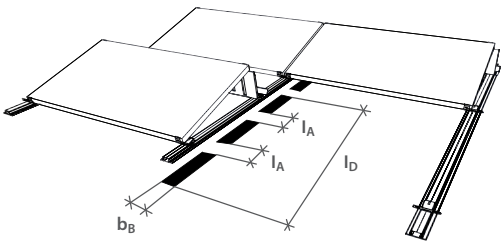


partial surface pressure [kg/m²] =

$$\frac{\text{sum of loads}}{\text{effective bearing area of the surface protection mat}}$$

the **sum of loads**
relating to one module is therefore:

Weight of module m_M
\+ approx. 5 kg weight of the mounting system m_{MS}
\+ ballast per module m_B
\+ snowload x module surface $S_0 \times A_M$

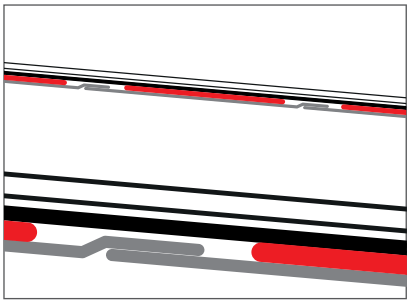


and the **effective bearing area of the surface protection mat is:**

A_{eff} = (length of continuous beam per module row l_D
– sum of gap widths between surface protection mat strips $l_{A)}$
x width of surface protection mat strips b_B

If the surface pressure is exceeded, we recommend the following measures:

- Supplementary continuous beam with additional support points at the center of the module (doubles the bearing area)
- Additional, thick and wide strips of protective matting 150/20 mm (increases the supporting surface by approx. 35%)



Continuous beam

Levelling mat

Bituminous roofing membrane

Guidelines with very thick roof sealing membranes

Deployment of a thick sealing membrane on a roof - e.g. a bituminous membrane, may result in an unevenness of surface due to the overlap of layers. Particularly in periods of high temperature, this can lead to blistering or to indentation by the continuous beam as these points are subject to a higher surface pressure. Additional underlay matting can be placed at the lower points of the membrane in order to achieve as even a distribution of load as possible (see picture on the left).

Guidelines for the deployment of very small units

For reasons of structural safety, at least two rows must be interconnected with the continuous beam. This means the smallest possible configuration is one module per row and two module rows.

Guidelines for deployment on roofs with substrate and gravel

On roofs with a substrate or gravel layer, it must be considered that superimposed loads for the system can be kept to a minimum only by ensuring that the connection to the substrate is sufficient to prevent sections of the system from sliding. In the case of gravel roofs, burying the bottom beam flush with the gravel surface usually suffices to maintain stability. On vegetated roofs, slip resistance can be achieved by taking some additional measures. A slip-resistant connection to the substrate can be created using bolts in the continuous beam, for example.

Guidelines for distance from the roof edge

For the system variants FixGrid 7 and FixGrid 15, a minimum distance of 1.5 times the tilted module height is to be maintained from the roof edge. This means, for example, for a horizontally arranged module with dimensions of 1.60/0.99 m, the required distance from the roof edge is 1.5 x 0.99 m. However, there is no mandatory distance from the edge for the system variants FixGrid100 7 and FixGrid100 15. The mandatory distance from the edge also applies if there are roof parapets. A potential extra distance from the edge due to shading must also be considered in the plans. The edge and corner zones of a flat roof do not equate to the load zones of the module field. Thus, increasing the clearance from the edge does not automatically result in reduced ballasting at the edges of the module field. This is due to dynamic behaviour of wind flow.

Components

FlatGrid base profile for surface protection mat strips	
128039-201	Base rail for FlatGrid 995 mm [south]
128039-209	Base rail for FlatGrid 1295 mm [south]
128039-208	Base rail for FlatGrid 1650 mm [south]
128039-203	Base rail FlatGrid 2150 mm [south, e/w]
128039-207	Base rail FlatGrid 2500 mm [e/w]
128039-211	Base rail FlatGrid 3550 mm [e/w]
128039-204	Base rail FlatGrid 4350 mm [e/w]
169004-004	Surface protection mat 10 m 110/8 mm with aluminium lamination
169004-003	Surface protection mat custom cut 300x110x20 mm, aluminium lamination

south = suitable for south design, **e/w** = suitable for east/west design

Further available lengths	
128039-202	Base rail for FlatGrid 1995 mm
128039-210	Base rail for FlatGrid 2995 mm
128039-206	Base rail for FlatGrid 3900 mm
128039-006	Base rail for FlatGrid 6000 mm

FixZ rail top	
121001-001	FixZ-7 top rail - custom cut
121001-004	FixZ-7 top rail - 4000 mm
121001-006	FixZ-7 top rail - 6000 mm
121001-06200	FixZ-7 top rail - 6200 mm
121003-001	FixZ-15 top rail - custom cut
121003-004	FixZ-15 top rail - 4000 mm
121003-006	FixZ-15 top rail - 6000 mm
121003-06200	FixZ-15 top rail - 6200 mm
129002-002	Connector E, pre-assembled
129019-001	Additional connector kit for FixZ-15 top

FixZ rail pieces	
121001-201	FixZ-7 system top rail - 100mm
121002-201	FixZ-7 system bottom rail - 100mm
121003-201	FixZ-15 system top rail - 100mm
121004-201	FixZ-15 system bottom rail 20 - 100mm
121006-201	FixZ-15 system center rail - 100mm (for snow loads up to 2.4 kN/m²)
121006-202	FixZ-15 system center rail - 200mm (for snow loads up to 5.4 kN/m²)

Accessories	
129004-000	KlickTop-cross connector kit M8
129062-001	Tension connector with accessories
169017-000	Additional load tray
169004-007	Surface protection mat 230x160 with retaining flaps



Module clamps

You will find a wide range of suitable module clamps in our component overview.

Technical data

Material	Surface protection mat: Rubber granulate with aluminium lamination; Connection elements: High-grade steel 1.4301 or higher quality; Other system components: Aluminium EN AW 6063;
Structural analysis	Structural analysis in accordance with current national standards [in Germany EN 1991, EC1 and "abZ" (German general technical approval)]. Structural analysis annex for the dimensioning of the amount of required ballast. Please make sure you observe the structural analysis information in each case!

Further information at: www.schletter.eu