



Solar Modules



Packing, loading & picking of solar modules

Instruction on how to proceed safely

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Subject to change at any time without notice.

The current information on packaging and transport at the time of publication of the document applies.

Solar Fabrik GmbH Laufach, 2022

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1. General information

Many thanks!

You have chosen Solar Fabrik solar modules. We would like to thank you very much for this and congratulate you on your decision.

Your goods will be packaged and loaded securely so that when you receive delivery, you will find our quality products undamaged.

However, should something not be in order, please contact your Solar Fabrik representative. He will then discuss what measures can be taken to deal with this.

Safety note

Before the solar modules are packaged and then loaded, please read these instructions carefully. It provides important information and guidelines for the safe packing and loading of solar modules. Should you unload and unpack our modules first, please read the unloading and unpacking instructions. All information contained therein is also valid for this manual.

In order to ensure a proper and correct procedure for packing and loading, the following measures and guidelines must be observed.

Hand out this instruction to the responsible persons or instruct them according to the contents of this document.

In the interest of your own safety, we ask that you take the points we have mentioned to heart.

ATTENTION!

There is a risk of injury and crushing when loading and packing the solar modules!

IMPORTANT!

Please also note that Solar Fabrik GmbH is not liable for any damage caused by disregarding these and other instructions.

Information on packaging and transport

Solar Fabrik solar modules are delivered by the pallet. The goods are packaged in protective corrugated cardboard box packaging and sturdily tied with plastic straps.

The number of modules per pallet depends on the respective module type. (see also Table 2 - p. 4)

Solar module packaging



On the front of cardboard box there is a list of the individual module data (flash data) of the solar modules on the pallet.

For security reasons, you will also receive these from us electronically by e-mail.

Individual module data (flash data)



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If you order full containers or full HGV-trailer combinations, you will receive the goods in double stacks of pallets. There are always two pallets stacked on top of each other.

In our opinion, this corresponds to efficient and sustainable transport, because it allows the maximum transport capacity to be used effectively.

The stacked pallets are secured with additional plastic strapping against unwanted shifting or falling.

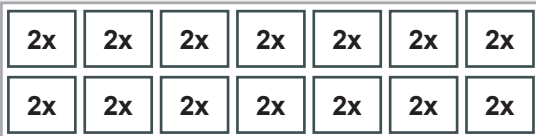
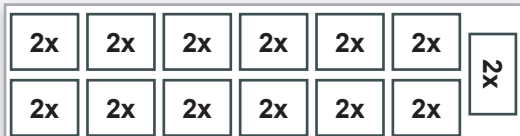
INFO!

With module-specific goods packaging and orders with insufficient quantities than the usual full load, the delivery is prepared individually for safe transport. Accordingly, other charging conditions may prevail than those described here.

Table 1 (see below) shows the usual arrangement of double stacks of pallets in the respective means

Technical specifications for transport

Table 1

Truck	Quantity:	28 pallets (14x2 pallets lengthwise) - 35mm module frame 868 modules - 30mm module frame 1008 modules	top view: 
	Weight:	max. 24 tons	
	Dimensions:	13.62x2.48x2.7 m	
Container 40' HC	Quantity:	26 pallets (12x2 pallets lengthwise, 1x2 pallets across) - 35mm module frame 806 modules - 30mm module frame 936 modules	top view: 
	Weight:	max. 24 tons	
	Dimensions:	12.03x2.35x2.69 m	

Technical specifications of our solar modules

Table 2

Solar module		Features			Pallet data		Quantity		
Series	Type	Cells	Dimensions (mm)	Weight	Dimensions (cm)	Weight	per pallet	per HGV	per 40 foot HC
Mono S4	N-Type Bifacial	108 units	1722/1134/30	23.7 kg	177/114/125	ca. 883 kg	36 units	1008 units	936 units
	Half-cells Black-Black	108 units	1722/1134/35	21.4 kg	177/114/125	ca. 694 kg	31 units	868 units	806 units
	Half-cells Black-White	108 units	1722/1134/30	21.2 kg	177/114/125	ca. 793 kg	36 units	1008 units	936 units
Mono S3	N-Type Bifacial	120 units	1755/1038/30	23.0 kg	180.5/113/117.5	ca. 858 kg	36 units	1008 units	936 units
	Half-cells	120 units	1755/1038/35	19.5 kg	180/113/121	ca. 635 kg	31 units.	868 units	806 units

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2. Packing notes

Additional materials required

You should have the following additional materials ready for picking.

1. One pallet
2. Cardboard protection
3. 2 lengthwise and crosswise plastic straps
4. Plastic foil (for 1-17 or 39-62 modules)
5. 2 corrugated cardboards (1-17 modules)
6. One carton and one corrugated cardboard (18-38 modules)

Additional materials







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Sizes and module allocation

Table 3

Number of modules	Layer on the pallet/ in the carton	Example
1-17	Modules are placed horizontally flush with the module rear wall facing downwards on the pallet with the corrugated cardboard. (see p. 8)	
18-31	Modules are placed vertically upright on the longitudinal side of the module on the pallet. From 31 modules side by side, the carton is full. If you are transporting fewer modules in the carton, these are divided as evenly as possible between the long sides of the carton. For 18 modules, for example, 9 modules are fixed to the right and 9 to the left in the carton with plastic straps. (see p. 9)	
32-38	From the 32nd module, 1-7 modules are placed horizontally with the module rear wall facing downwards on the carton with the 31 standing modules.	
39-62	After stacking 1-7 modules horizontally in the carton, the carton is full. A new pallet (see 1-17) or a new carton is started depending on the number of remaining modules (see 18-31 and 32-38).	

The packaging of the solar modules depends on the number.

IMPORTANT!

A maximum of 17 modules can be shipped lying on the pallet. From the eighteenth module onwards, they are fixed upright in the carton. 31 modules fit side by side upright in the carton.

Never place more modules next to each other! You can position up to 7 additional modules horizontally upright on the 31st module.

After that you have to use a new carton or pallet. Observe these specifications, only in this way can optimum goods security and safe personal protection be guaranteed.

For the respective protection of the modules, please also use the specified protective materials. Remember the corrugated cardboard and the edge protector, as well as the plastic straps (see p. 8&9)

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Preparatory information and notes on unpacking:

- Please also pay attention to your own safety when unpacking the solar modules, as there is again a risk of injury and crushing here!
- The pallets should be placed on a flat and firm surface when unpacking.
- At least two persons are needed for unpacking and packing. Never work alone!
- Use strong scissors or side cutters to safely separate the banding. There is an increased risk of injury when using carpet knives.
- If you do use carpet knives, please wear protective gloves for your own safety to avoid cuts.

ATTENTION!

On delivery, the solar modules are placed lengthwise on the transport pallet. This storage allows two pallets to be stacked on top of each other for transport.

When unpacking, the solar modules are still relatively stable when packed together. However, it cannot be ruled out that the modules could tip over without protective packaging. There is a risk of injury and possible damage to the goods.

TIP:

Position the pallet with the packed solar modules in front of a stationary object. (see also pictures on the right) This should be able to withstand the weight and have an insensitive surface. This way you can prevent unintentional tilting of the goods in the opposite direction when unpacking the solar modules.

In the following, we present two possible variants of how you can securely pack the solar modules, depending on the number of modules.

Pallet ready for unpacking



Lift upper pallet



Positioning double stack of pallets



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Variant 1

Packing the solar modules [1-17 Modules]:

Materials needed: Pallet, corrugated cardboard, plastic straps, cardboard protection, plastic foil

1. Place down the full module pallet and an empty pallet ready for picking.
2. Always place the corrugated cardboard on the pallet first so that the module connectors are not damaged during transport.
3. Unpack the full pallet and refer to the brochure "Unloading and Unpacking Solar Modules".
4. Place the modules horizontally on the pallet and stack them. Make sure that an edge protector is attached to every second module. If not, attach it, otherwise the modules lying on top of each other will be damaged. Make sure that the module connector is attached to the module rear wall. This prevents damage to the module underneath.
5. During stacking, make sure that the modules are correctly aligned. Stack the modules flush on top of each other.
6. Place a piece of corrugated cardboard on the last module of the pallet so that the module is not damaged.
7. Secure the modules with two lengthwise and two crosswise plastic straps. Use the cardboard protection when the plastic strap is against the carton.
8. Wrap the pallet with a plastic foil to prevent scratches on the module. If you do not have a foiling machine, use a foil roll.

Prepare pallet



Attach edge protector



Secure and place foil around modules



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Variant 2

Packing the solar modules [18-31 Modules]:

Materials needed: Pallet, carton, plastic straps, cardboard protection, plastic foil

1. Place down the full module pallet and an empty pallet ready for picking.
2. Place the carton in the centre of the pallet and open it.
3. Unpack the full pallet and refer to the brochure "Unloading and Unpacking Solar Modules".
4. Place the modules upright (vertically) in the carton and make sure that the edge protector is attached to every second module. If not, attach it. Make sure that the module connectors are on the module rear wall, otherwise the connector will damage the module underneath. Make sure that the top and bottom edges of the modules are flush with the other modules in the carton. Make sure that the modules do not fall over.
5. Divide the modules evenly in the carton and secure them with plastic straps through the wall of the carton so that the carton is evenly loaded.
6. Secure the packed carton by attaching two plastic straps each lengthwise and crosswise around the carton. Use the cardboard protection when the plastic strap is against the carton.
7. If you stack two cartons on top of each other, wrap both pallets with plastic foil to prevent damage to the freight.

Position module



Fastening the modules



Plastic strapping on the outside



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3. Loading goods securely

Ready-packed modules

After you have securely packaged the modules, you can start loading them.

ready package 1-17 modules



ready package 18-31 modules



ready package 32-38 modules



ready package 39-62 modules



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In order to avoid accidents and damage to the goods during loading, you should take the following instructions into account.

Safety instructions for loading

- When loading, we urge you to ensure that the ground is level and firm. There is a risk of tipping over on uneven and / or unpaved surfaces.
- We always recommend loading from the rear via a loading ramp.
- If no loading ramp is available and loading via the rear side is not possible, the goods can be loaded via the long side of the trailer (if possible).
- When loading from the side, make sure that the front pallets are first loaded as a double stack into the HGV trailer.
- In the next step, the pallets behind them have to be moved to the front row, to a favourable loading position, with a pallet truck. From there, they can be unloaded with a forklift truck or other aids.
- When loading, please make sure that suitable aids (pallet truck, forklift truck, or similar) are used with the following minimum requirements:
 - + Fork length: > 1.70 m
 - + Lifting height: > 1.30 m
 - + Payload pallet 60-cell modules: > 1.40 t
 - + Payload pallet 120-cell modules: ... > 1.40 t
 - + Payload pallet 72-cell modules: > 1.70 t
 - + Payload pallet 144-cell modules: ... > 1.70 t
- Not suitable and permitted is loading by hand. A pallet truck is only suitable for positioning the module pallets in the HGV.
- Position the pallet double stacks with the forklift truck in a row in front of the HGV
- Load the pallet double stacks in the HGV with the pallet truck or the forklift truck
- We ask you to look out for your own safety. There is a risk of injury and crushing during transport and loading!

Double stack of pallets



Lifting a pallet with a forklift



Loading into the HGV





Solar Modules



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