



Solar Modules



Unloading & Unpacking of Solar Modules

safe practice guide

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We reserve the right to make changes at any time.

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

Solar Fabrik GmbH, Laufach, 2022

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1. General information

Many thanks!

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

Your goods have been securely packaged and loaded, to ensure that you also find our quality products free of damage at the time of delivery. If something should still be wrong, please contact your responsible Solar Fabrik contact person. He will then discuss further measures with you.

Safety note

Please read these instructions carefully before unloading and unpacking the solar modules. They provide important information and guidelines for the safe unloading and unpacking of the solar modules.

In order to ensure a proper and correct procedure for unloading and unpacking, the following measures and guidelines must be followed.

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

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

ATTENTION!

When unloading and unpacking the solar modules there is a risk of injury and crushing!

IMPORTANT!

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

Information on packaging and transport

Solar Fabrik solar modules are delivered on pallets. The goods are packed in protective corrugated cardboard boxes and tied up 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 side of each box you will find a list of the individual module data (flash data) of the solar modules on the pallet.

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

Single module data (flash data)



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

In our opinion, this corresponds to efficient and sustainable transport, as the maximum transport capacity can be used effectively.

The stacked pallets are secured against unintentional movement or falling down with additional plastic banding.

INFO!

In the case of module-precise goods packaging and orders with a smaller quantity than the usual full load, the delivery is prepared individually for safe transport. Accordingly, different loading conditions than those described here may then prevail.

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

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:	13.62 x 2.48 x 2.7 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:	12.03 x 2.35 x 2.69 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. Notes on unloading

As we usually deliver the goods in double stacks of pallets, there are a few points to be observed when unloading. To avoid accidents and damage to the goods, you should consider the following advice.

Safety instructions for unloading

- When unloading, we strongly ask you to ensure that the ground is level and solid. There is a danger of tipping over on uneven and / or unpaved surfaces.
- We recommend unloading from the rear side via an unloading ramp.
- If no unloading ramp is available and unloading via the rear side is also not possible, the goods can be unloaded via the long side of the trailer (if possible).
- When unloading to the side, ensure that the front pallets are first unloaded from the truck trailer as a double stack.
- In the next step, the pallets behind them must be brought into the front row, in a favourable unloading position, using a pallet truck. From there they can be unloaded with a forklift or other aids.
- When unloading, please ensure that suitable aids (front loader, forklift, or similar) with the following minimum requirements are used:
 - + Fork length: > 1.70 m
 - + Lifting height: > 1.30 m
 - + Load capacity pallet 60 cell modules: > 1.40 t
 - + Load capacity pallet 120 cell modules: > 1.40 t
 - + Load capacity pallet 72 cell modules: > 1.70 t
 - + Load capacity pallet 144 cell modules: > 1.70 t
- Not suitable and permitted is unloading by hand or with a pallet truck. Lift trucks are only suitable for positioning the modules in the truck/container.
- Please be aware of your own safety. There is a risk of injury and crushing during transport and unloading!
- After unloading from the truck or container, make sure auxiliary equipment is available for lifting the top pallet from the stack.

Double pallet stacks



Loosening the strapping



Lift and lower pallet with forklift



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3. Instructions for unpacking

General Information:

- Please also pay attention to your own safety when unpacking the solar modules, as there is again a risk of injury and crushing!
- When unpacking, the pallets should stand on a flat and solid surface.
- At least two persons are required for unpacking. Never work alone!
- Use strong scissors or side cutters to cut the straps safely. The use of carpet knives increases the risk of injury.
- 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 makes it possible to stack two pallets on top of each other for transport. The solar modules are still relatively stable when unpacked. However, it is not possible to rule out the modules tipping over without protective packaging. There is a risk of injury and damage to the goods is also inevitable.

TIP:

Position the pallet with the packed solar modules in front of a fixed object. (see also pictures on the right) This should be able to withstand the weight and have a non-sensitive surface.

This way you can prevent the goods from unintentionally tipping in the opposite direction when unpacking the solar modules.

In the following, we present two possible ways to unpack the solar modules safely.

Positioning of double pallet stacks



Lift and lower top pallet



Pallet ready for unpacking



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Preparations for unpacking:

1. First remove the protective film. Use a carpet knife and carefully cut the film from top to bottom. (see arrow figure 1) Take care not to cut through the cardboard.
2. Then pull the film up and off.
3. The cardboard box is always double-lashed on each side. First loosen all vertical straps. It is safest to remove these using strong scissors or side cutters.
4. Leave the horizontal strapping intact for the time being.
5. In the next step, open the box over the lid. Gently cut the tape that seals the box with a carpet knife. Make sure that the knife does not scratch the module frames below.
6. Fold the cover sides outwards.
7. Make sure the module strapping inside the box is undamaged before you remove the horizontal external strapping.

Remove film



Remove the vertical external strapping



Open carton / check inside bandaging



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Variant 1

Unpacking the solar modules [remove carton]:

8. Now undo the horizontal strapping on the outside. The vertical strapping on the inside prevents the modules from tipping or falling over.
9. Now lift the outer packaging upwards. A second person is quite helpful here. If necessary, the cardboard can also be cut open at one edge. Use strong scissors for this. When using a carpet knife, you should be careful not to injure yourself or damage the solar modules.
10. Before you can remove the solar modules individually from the pallet, you only need to remove the vertical strapping. Here we recommend that you work in pairs again. One person secures the modules against tipping over to the front, while the second person loosens the straps. If, as already described on page 6, you have positioned the pallet in front of an immovable object (see arrow figure 10), the modules are secured against tipping over to the rear. Here they can also be leaned against.
11. Dispose of the packaging material via the regular disposal route. Separate the materials so that they can be properly recycled.

Remove horizontal strapping



Remove cardboard



Remove modules individually



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Variant 2

Unpacking the solar modules [directly from cardboard]:

8. Now remove horizontal strapping on the outside. The cardboard prevents the modules from tipping over or falling over.
9. Loosen the vertical strapping on the inside. You can cut out a part of the tape with a pair of strong scissors / side cutter if you do not want / cannot pull out the tape completely. The tape then remains in the box when unpacking the modules.
10. If you want to / can remove the strap, first check where the metal clip for fastening the strap is located. Cut the strap and pull it gently towards the connecting clip. If you pull out the strap in the wrong direction, the clip will damage the modules. The cardboard corners should protect the frames sufficiently against friction when pulling out the strap.
11. Remove the horizontal strapping on the inside. To do this, pull the long side of the carton slightly outwards and carefully cut through the upper strap. (see arrow figure 11)
12. To reach the lower strap, the outer packaging must be lifted slightly. A little help from additional personnel is advantageous.

Remove horizontal strapping on the outside



Cut vertical strapping on the inside



Cut horizontal strapping on the inside



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13. The solar modules can now be removed individually. Work in pairs here. This makes handling much easier and also protects the solar modules.

Remove modules individually



14. The more modules you unpack, the more unstable the remaining modules in the box become.

15. To prevent damage, you can prevent the solar modules from fanning out with some adhesive tape. To do this, simply stick a strip on each side over the cardboard corners on the outside.

Use tape that is not too strong to avoid unwanted residues on the module frames.

Secure the modules



16. We recommend that small residual quantities from the box be transferred flat by hand to another pallet. This prevents the solar modules from falling over. It is always best to do this in pairs.

Storing modules



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4. General notes:

Please check the completeness of the shipment immediately upon receipt:

- Compare the quantity listed on the consignment note, express note or delivery note
- Compare the number of packages
- Check the goods for damage (also damage to the packaging, such as footprints)
- Checking the optics and tensile strength of the connectors

If defects are discovered during the inspection, these must be reported to Solar Fabrik immediately and before the modules are installed.

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5. Notes:



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