



Building Your Trust in Solar

STORAGE AND UNPACKING INSTRUCTION OF PHOTOVOLTAIC MODULES

This manual is for Jinko solar PV module storage and unpacking instructions. To ensure the safety of loading, unloading, unpacking and storage of PV modules, please read this manual carefully.

When you need to unpack and install the modules, you can search and download relevant content from Jinko's official website.

(www.jinkosolar.com)

HANDLING INFORMATION

1.1 Forklift handling precautions

- In the process of loading and unloading, the forklift should be selected reasonably according to the size and weight of the goods. If the fork length is less than 3/4 of the size of the goods, extension sleeves should be fitted on the forks before the module is forked, in order to avoid the packing container dumping when moving the forklift;
- When the forklift is loaded with modules, the spacing between the two forks should be adjusted as required. The load of the two forks should be balanced without deflection. One side of the module package should be close to the retainer (Figure1);



Figure 1

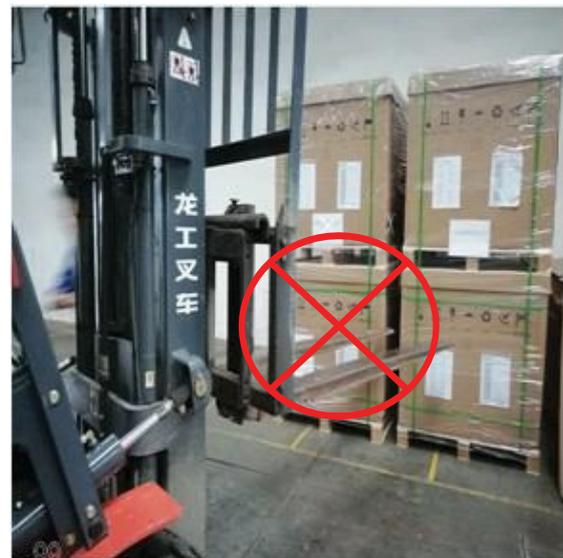


Figure 2

- Avoid sharp objects (such as forklift pallet fork) contact or collision with module box, so as not to damage the internal modules (Figure 2);
- Loading and unloading process, except forklift operator, others should be kept at a safe distance from range, ensure the safety of personnel;
- During loading and unloading, special command is required to avoid failure and making modules down;
- When using a forklift to move palletized packing boxes to the operation area, the forklift shall be slowly and steadily lifted and put down gently during loading and unloading, and the modules shall avoid turbulence and violent vibration during transportation.

HANDING INFORMATION

1.2 Notes for container handling

- In order to prevent the safety of placing and unpacking modules affected by tilt and uneven ground, please choose flat ground when unloading.
- When unloading on the platform or ground, steel plate pads or tooling shall be used to assist in moving the goods out of the container smoothly, to avoid module bumps caused by the gap between the platform and the container floor (Figure 3);
- It is recommended that the inclination angle between the fixture pad and the plane should be less than 5°, to avoid the forklift hit the top of the container due to too much inclination when it comes out of the container;
- When unloading cross-loading modules, special command is required to ensure that the forklift does not exceed the modules, and prevent damage to adjacent modules when fork is raised or placed due to excessive length of forklift arms (Figure 4);
- When unloading, the whole modules should be balanced as far as possible, the forklift arm should be kept relatively horizontal, and the forklift truck should fork the modules out of the container slowly and smoothly;



Figure 3



Figure 4

HANDLING INFORMATION

- During the fork out of the modules, it is allowed of 2~3cm spacing between modules and walls or adjacent modules, and then move back slowly to prevent the carton from being damaged by friction between modules and wall or adjacent modules (Figure 5);
- When the goods go out of the container port, please slow down, and lower the height of the forklift arm from the ground (it is recommended to close to the bottom plate to reserve enough space for the top), pay attention to the distance between the bottom of the goods and the top of the container, prevent the goods from colliding with the top of the container, and ensure that the whole pallet module is safely removed from the container (Figure 6);
- If the modules need to be temporarily stored after unloading, it is recommended to keep sufficient space between each pallet to avoid scratching the carton or pallet during the second transfer.



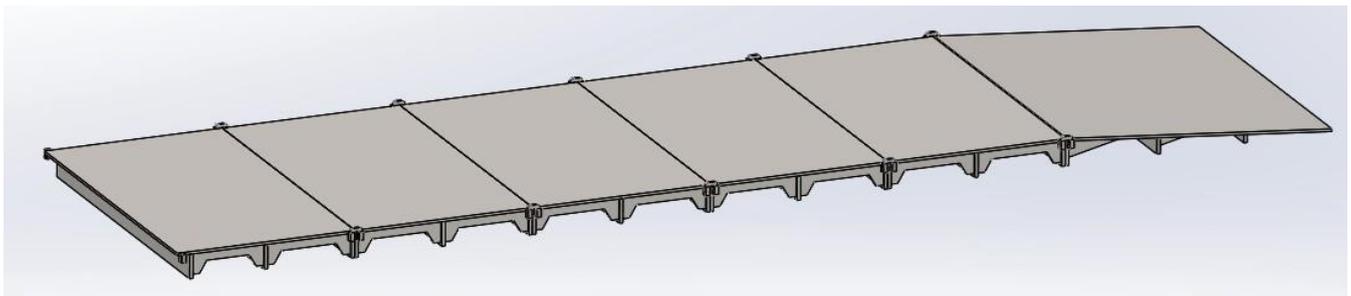
Figure 5



Figure 6

1.3 Tiger Pro/Neo container handling requirements and precautions

- Unloading Tools: Forklift/Unloading platform/Unloading pad tooling.
If the container is unloaded on the unloading platform, it is required to be used with the unloading platform or tooling.



HANDING INFORMATION

- The height of the unloading platform and the height of the unloading tooling should be kept at the basic level with the bottom of the container (loading bottom plate), and the height tolerance should be controlled within $\pm 10\text{mm}$.

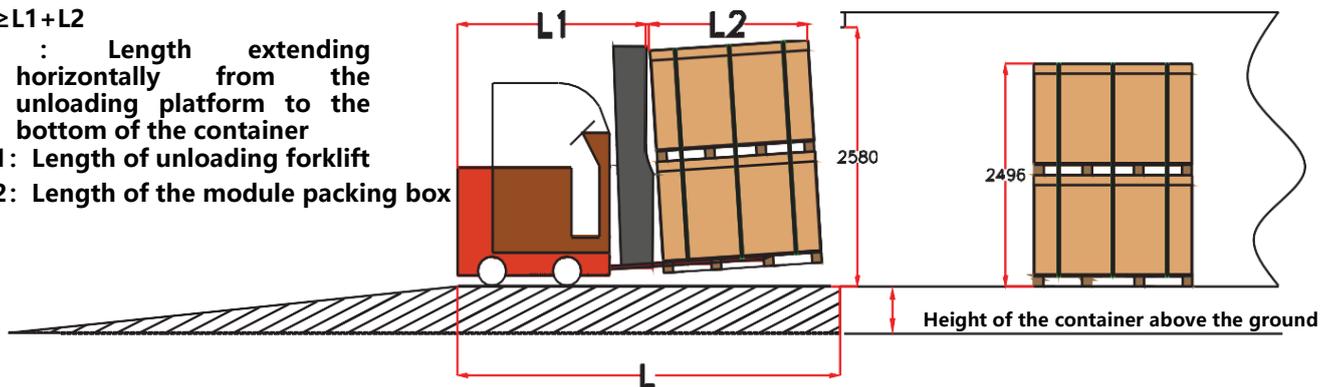
The length of the horizontal extension of the unloading platform or unloading tooling $L \geq$ the total length of the unloading forklift and the length of the module packing box.

$$L \geq L1 + L2$$

L : Length extending horizontally from the unloading platform to the bottom of the container

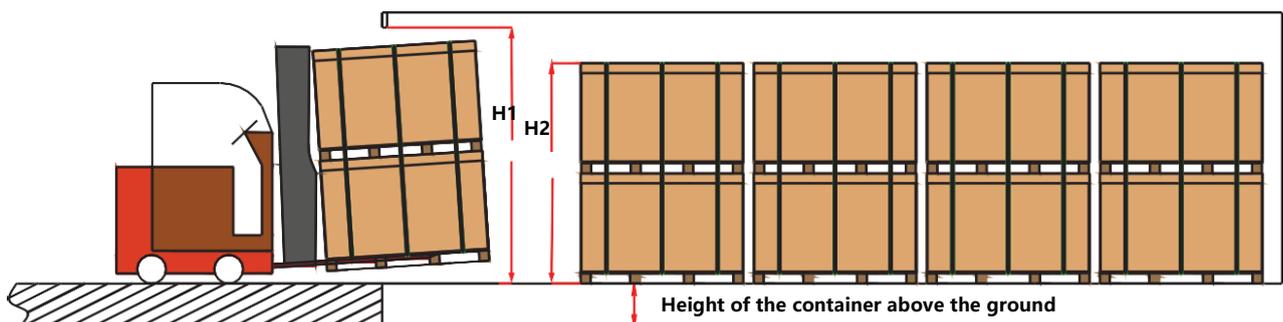
L1: Length of unloading forklift

L2: Length of the module packing box



- When the container is unloaded:
When using the fuel forklift, adjust the height of the forks from the ground, the forks into the short side of the pallet, after the forks into the bottom, lift the modules at an appropriate height (the tilt angle required to lift the modules $< 2^\circ$), the smaller the distance from the ground when the forklift out of the container door, ensure that the height of the forks from the ground and the distance from the goods to the top of the container is not more than 80mm ;
When the horizontal electric forklift is used to unload the goods, the arm length of the forklift mechanical arm is required to be $\geq 1800\text{mm}$. The arm length of the forklift mechanical arm is required to lift the modules from the short side of the pallet with a fork (the height of the forklift is required to be $\leq 40\text{mm}$ from the ground), and the modules are moved out slowly.
If the modules are unloaded from long side forks, fuel oil forklifts are needed to unload.

H2: Height of the module packing box
H1: Height of the container door



HANDING INFORMATION

1.4 Attention in loading and unloading with hoisting

- The hoisting rope of crane unloading needs to choose a longer nylon sling, wire rope is not allowed to use (Figure 7) ;
- Before lifting, the length of the sling should be evenly distributed on both sides to avoid the case body tilting to one side during lifting, which causes the sling to be too tight and the assembly to explode;
- When lifting, the box should be kept balanced to avoid module tilting ;
- When someone is required to direct the hoisting box to fall during unloading, it shall be kept as flat as possible to avoid collision and throwing of the module box, and the ground shall be flat (Figure 8).



Figure 7



Figure 8

- In order to minimize the impact of sling on the safety of goods in the process of hoisting, the modules without frame should be supported during loading and unloading. For example, wooden sticks, boards, or other fixtures of the same width as the outerpacking cases should be used on the upper part of the box to reduce the pressure of the contact position on the box (Figure 9).

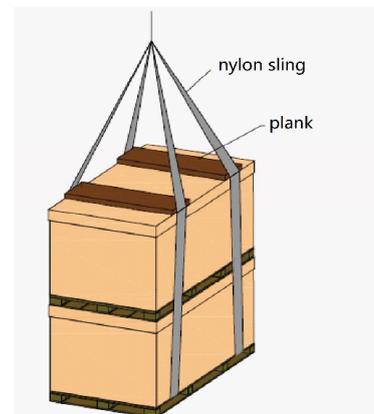
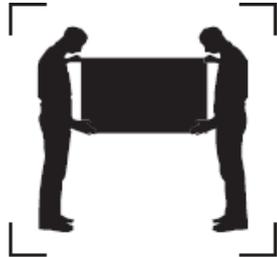


Figure 9

STORAGE INFORMATION

MODULE SHOULD BE HANDLED BY 2 PERSONS



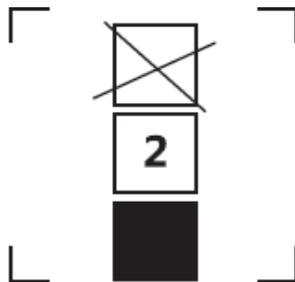
**MODULE SHOULD BE
HANDLED BY 2 PERSONS**

KEEP DRY



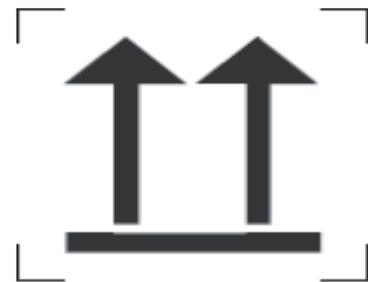
KEEP DRY

STACK LIMIT IN 2 UNITS THIS SIDE



STACK LIMIT IN 2 UNITS

THIS SIDE UP



THIS SIDE UP

FRAGILE



FRAGILE

DO NOT STEP ON



DO NOT STEP ON

STORAGE INFORMATION

2.1 Attentions for storage

- Due to the complex environment and climate of the project site, it is recommended to store the stacked modules with single support after dismantling in order to ensure the safe storage of the modules on site (Only after cutting the outer packing belt of the connecting two brackets, separate the upper and lower brackets), the dual glass modules shall be stored with single pallet after dismantling;
- The modules shall be stored in a complete outer package. The storage area shall be protected pallets and boxes from damp, direct sunlight and waterproof (rain) measures;
- The modules storage areas should be kept dry, level, the ground and the horizontal Angle is less than 10 °;
- Make sure that all modules with the same current gear are installed in the same area centrally (Square matrix, combiner box);



Figure 10



Figure 11

- The modules should be placed neatly with a safe distance between the boxes. The spacing between boxes should be greater than 30cm (Figure 10) ;
- Please do not stack other items on the modules or boxes (Figure 11).

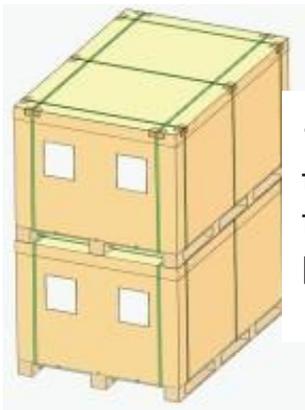
UNPACKING INSTRUCTION

3.1 Equipment and Tools: Cutter, Glove, Forklift

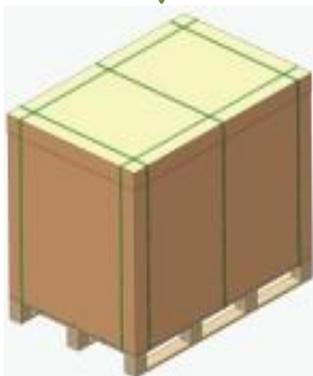
3.2 People: No less than two persons

3.3 Unpacking step

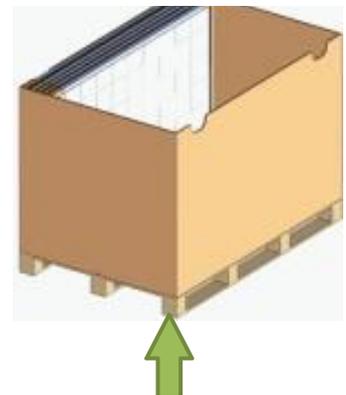
Packing method A:



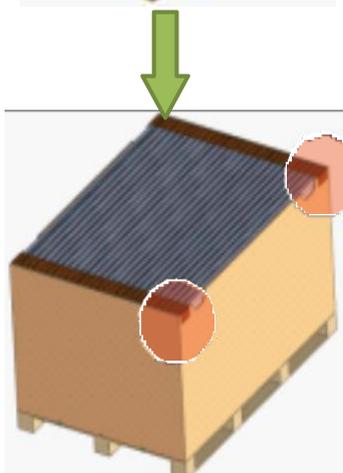
1. Cut off straps within the two pallets, and use a forklift to separate the two pallets.



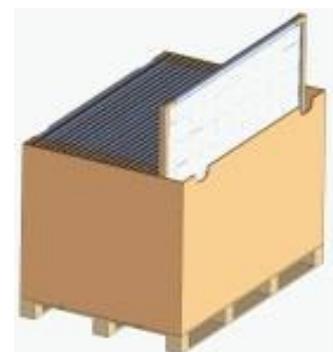
2. Cut off the packing straps of the single pallet, then remove the isolated wood (or plastic wrap) and the carton cover.



4. Remove the remaining modules from the box sequentially.



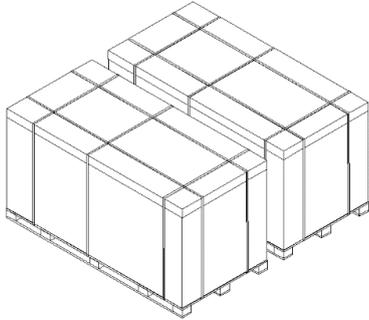
3. Remove the first module labeled "1" from the opening position (marked in red) firstly.



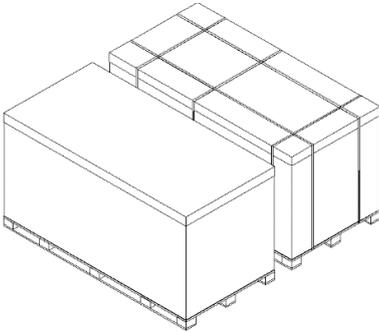
5. When the last 5 pieces of modules are left in the box, please placed to a solid support on the side of modules to avoid the box turned over due to the strong wind and accidental collision.

UNPACKING INSTRUCTION

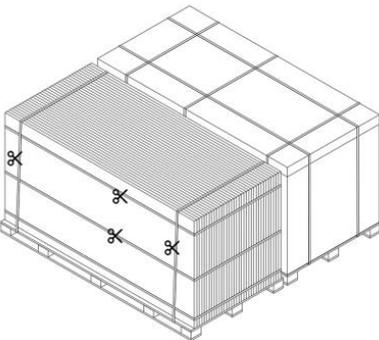
Packing method B: Plan 1 (Conventional Packaging)



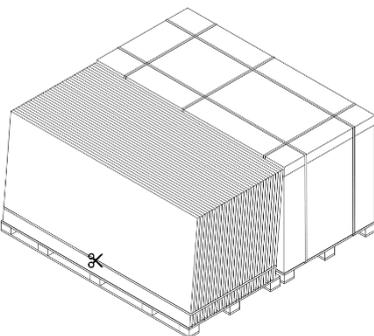
1. Remove the wrapping film around the box and separate the upper and lower boxes.



2. The long side of the module to be unpacked needs to be close to a solid support for about 15-20cm distance, the support could be a wall, rack or another unpacked module box of the same type, and then use scissors to cut all the packing strap of the outer box.



3. Remove the top cover of the box, and then remove the carton by lifting it. Two persons hold the modules to prevent them from tipping over. The other person cuts the top 2 horizontal straps and the 2 vertical straps of the modules, retaining the bottom horizontal strap.

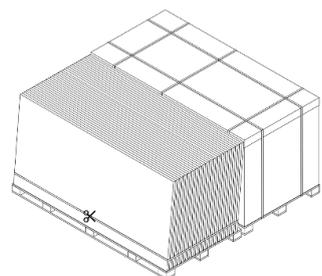
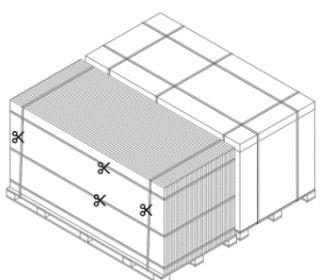
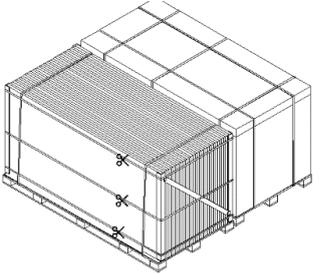
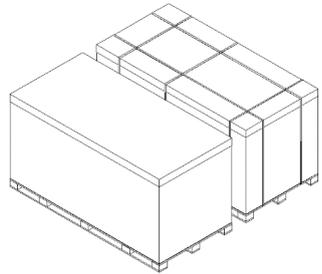
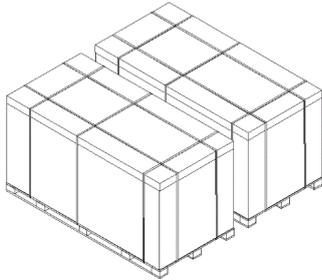


4. Stand on both sides of the short side of the module and slowly lean the module towards the support, and when the module is completely leaning on the support, cut the remaining bottom horizontal packing strap on the short side; finally, remove all modules sequentially from the outer one.

Note: When cutting the internal packing strap, the person must stand on both sides of the short side to avoid the modules from sliding down and hitting person due to rough ground. The remaining modules should be placed flat and packed with the straps before being transported.

UNPACKING INSTRUCTION

Packing method B: Plan 2 (With the internal wooden N-shaped protectors)

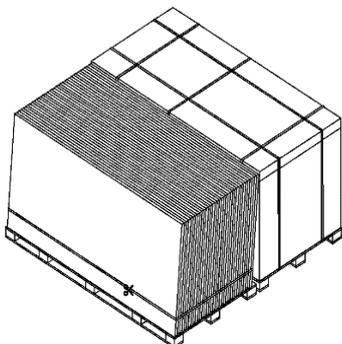
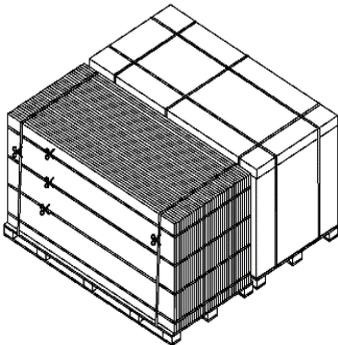
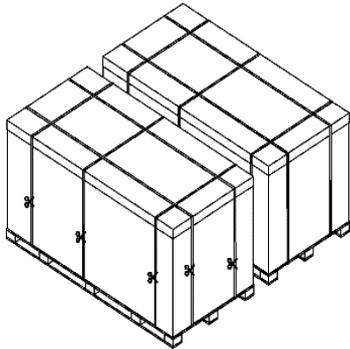
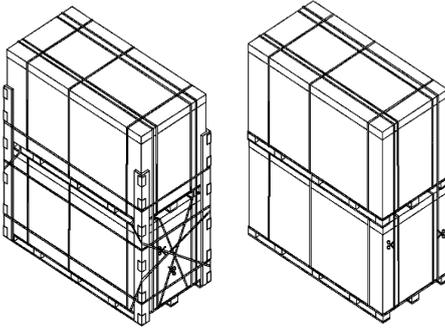


1. Remove the wrapping film around the box and separate the upper and lower boxes.
2. The long side of the module to be unpacked needs to be close to a solid support for about 15-20cm distance, the support could be a wall, rack or another unpacked module box of the same type, and then use scissors to cut all the packing strap of the outer box.
3. Remove the top cover of the box, and then remove the carton by lifting it. Cut the 3 horizontal straps on the wooden N-shaped protectors and then remove the wooden N-shaped protectors.
4. Two persons hold the modules to prevent them from tipping over. The other person cuts the top 2 horizontal straps and the 2 vertical straps of the modules, retaining the bottom horizontal strap.
5. Stand on both sides of the short side of the module and slowly lean the module towards the support, and when the module is completely leaning on the support, cut the remaining bottom horizontal packing strap on the short side; finally, remove all modules sequentially from the outer one.

Note: When cutting the internal packing strap, the person must stand on both sides of the short side to avoid the modules from sliding down and hitting person due to rough ground. The remaining modules should be placed flat and packed with the straps before being transported.

UNPACKING INSTRUCTION

Packing method B: Plan 3(With the exterior wooden protector and cross-packing)



1. Remove the wrapping film around the box, then cut the cross-packing straps and remove the exterior wooden protector.
2. Cut the straps of the upper and lower modules packages, then separate the upper and lower modules boxes.
3. The long side of the module to be unpacked needs to be close to a solid support for about 15-20cm distance, the support could be a wall, rack or another unpacked module box of the same type, and then use scissors to cut all the packing strap of the outer box.
4. Remove the top cover of the box, and then remove the carton by lifting it. Two persons hold the modules to prevent them from tipping over. The other person cuts the top 3 horizontal straps and the 2 vertical straps of the modules, retaining the bottom horizontal strap.
5. Stand on both sides of the short side of the module and slowly lean the module towards the support, and when the module is completely leaning on the support, cut the remaining bottom horizontal packing strap on the short side; finally, remove all modules sequentially from the outer one.

Note: When cutting the internal packing strap, the person must stand on both sides of the short side to avoid the modules from sliding down and hitting person due to rough ground. The remaining modules should be placed flat and packed with the straps before being transported.

UNPACKING INSTRUCTION

3.4 Attention to unpacking

- When opening cartons outdoors, avoid operating on rainy days because the cartons will soften and spread out to damage modules after rain;
- Fixed measures shall be taken for disassembled modules when outdoor wind-operated. It is advisable not to move the modules to avoid damage;
- Stack modules in a ventilated, rainproof, and dry place before the modules are unpacked;
- Use scissors or art knife to cut the outer box packing tape. Do not scratch glass. Confirm the number of modules in the box immediately after opening the case;
- After leaving the box, support should be placed on the back of the assembly to prevent the modules from collapsing (Figure12);
- The working ground needs to ensure that the packing box can be stably placed horizontally to avoid dumping of the modules;
- The transshipment movement of the packing box shall be completed before the outer packing case is removed, and after unpacking, it shall no longer be transshipped with no fixed protection of the packaging material, and it shall be repackaged before being transported, or a single piece of manual short distance lifting shall be carried out;
- Please wear protective gloves during unpacking and handling to avoid scratching hands or leaving fingerprints on glass;
- Each module needs to be carried by 2 people, pull the junction box is prohibited in any case, when lifting the module, grab the short edge and take out the module (Figure 13);
- Do not remove the corner guard from the modules before installation;
- The install remaining modules should be placed centrally and protected by packing case;
- Before installation, please use scissors to cut the binding band of the fixed wire to avoid the connector hitting the back and damaging the modules.

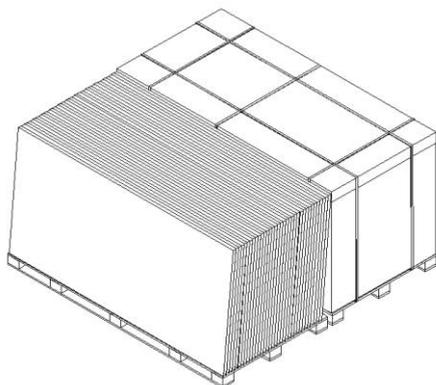


Figure 12



Figure 13

UNPACKING INSTRUCTION

3.5 Instruction for unpacking, handling and sampling at project site

1. When the modules are transported at the project site, the transportation route shall be selected on a smooth road to avoid damage or cracks of the modules caused by turbulence, collision, extrusion, tilt and other factors. The modules shall be transported on a flat ground;
2. Remove the packing straps and protective film of the upper and lower pallets, and separate the upper and lower pallets with a forklift truck (the shelf wall of the forklift truck shall have cushions, such as foam or silicone pads, to prevent hidden cracks caused by the collision or extrusion between the modules and the shelf wall (Figure 14));
3. If the modules need to be spot tested, please refer to the unpacking instructions of this manual 3.3/3.4 to unbox the modules;
During the unpacking process, a solid support has to be provided on one side of the module to prevent it from toppling over (Figure 15);

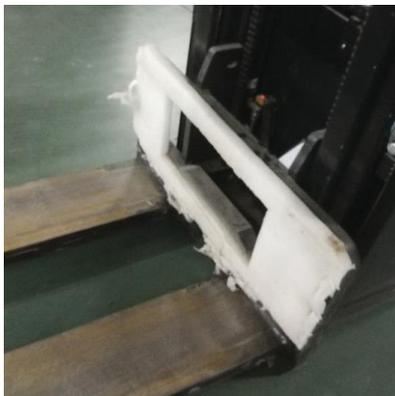


Figure 14(1)

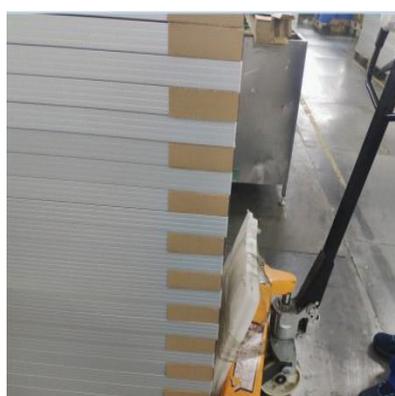


Figure 14(2)

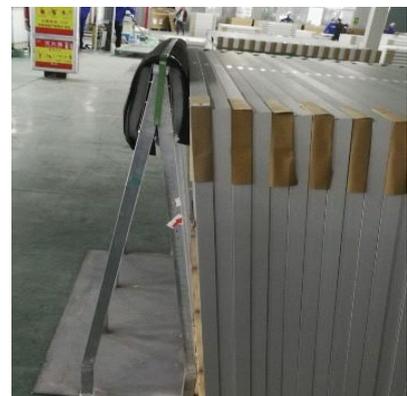


Figure 15

4. When taking the modules out of the box, it is recommended to use protective tooling to separate the modules to prevent friction from producing flecks. Hard pulling and skewed drawing of the modules are not allowed (Figure 16).

UNPACKING INSTRUCTION

5. After modules are taken out of box, they should be placed on a vacant pallet. Module should be carried by two people and handled with care during the sampling process (Figure 17). In the process of sampling, the following precautions should be paid attention to avoid causing secondary cracks of modules;
 - a) If you need to remove the ties which are used to fix cables, use a tool such as scissors to cut off the ties. And do not hit the rear side of module with the connector.
 - b) If the module needs to be turned over, fixing measures (adhesive tape, etc.) shall be adopted to fix the connectors to prevent the cracks caused by the drop of the connectors (Figure 18);
 - c) After the completion of the test, remove the tape on the cable, and then fix the cable with a tie, and then pack the modules again for secondary transport;



Figure 16



Figure 17



Figure 18

INSTRUCTION FOR SAMPLING

4.1 Instruction for sampling at the project site

1. Remove the tie: hold the connector upward with right hand, twist the connector and pull it upward slightly. Cut the tie with scissors, and do not make the connector hit the rear side of the module.



2. Connect the connector: When connecting the connector, do not shake the cable to avoid damaging the module.
3. Turn over the module: Use fixing measures (adhesive tape, etc.) to fix connector or hold the connector and cable with hands to prevent the cracks caused by the dropped connector or cable.

4.2 Instruction of sample modules

1. Sample modules must be selected for sampling with no damage to the outer package.
2. If the client will have a second transfer of modules, Jinko is only responsible for the EL test results of the modules at the first unloading point.

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