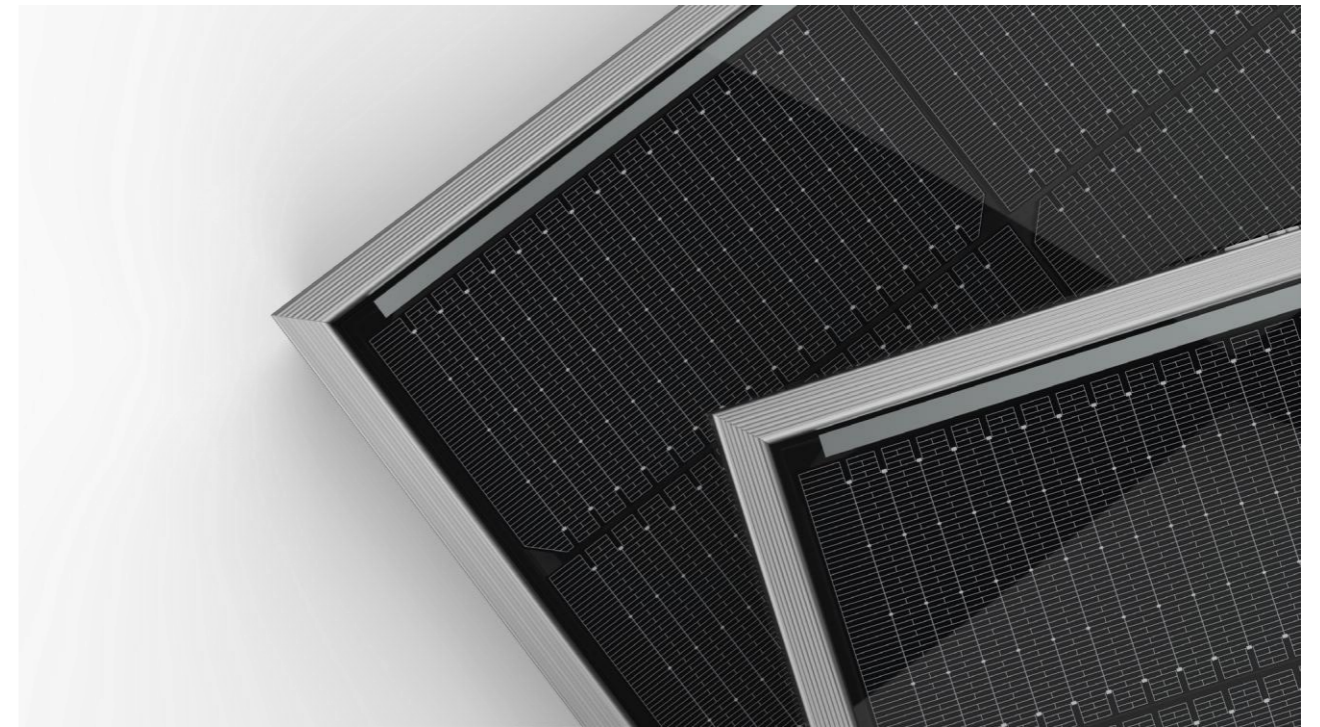


Handling, Storage and Unpacking Instructions



This manual describes the handling, storage and unpacking of JinkoSolar PV modules. To ensure safety when loading, unloading, unpacking and storing PV modules, please read this manual carefully. You can find this and other related contents on Jinko's official web-site: www.jinkosolar.eu

JinkoSolar Switzerland AG

Chamerstrasse 85
6300 Zug SWITZERLAND
Tel: +41 41 748 0010
Fax: +41 41 748 0019

JinkoSolar GmbH

Freisinger Straße 9
85716 Unterschleißheim GERMANY
Fax: +49 89 1433246-29

JinkoSolar Enerji Teknolojileri A.Ş.

NİDA KULE İş Merkezi Göztepe Merdivenköy
Mah. Bora Sk. No:1, Kat:7 34732, Kadıköy,
İstanbul, TURKEY



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1. HANDLING INFORMATION

1.1 Forklift handling precautions

When 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 assembly is forked, 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 assembly box should be close to the retainer (Figure 1).

Avoid impact or collision of sharp objects (e.g. forklift forks) with the boxes or pallets to avoid damaging the internal modules (Figure 2). Please, note that damages caused by such impacts during movements under the responsibility of the customer are not considered a logistical failure but an improper handling of the boxes.



Figure 1



Figure 2

In the process of loading and unloading, except for the forklift operator, all others must keep a safe distance from the range to ensure the safety of personnel.

During loading and unloading, special command is required to avoid failures and making modules to fall out.

When using a forklift to move palletized packing boxes to the operation area, the forklift shall be lifted and lowered steadily, slowly and smoothly during loading and unloading to avoid turbulence and violent vibrations of the modules during transport.

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 hitting 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

During the fork out of the modules, there must be 2-3 cm space between modules and box walls or adjacent modules, and then move back slowly to prevent the carton from being damaged by friction between modules and box wall or adjacent pallets (Figure 5).

When the goods go out of the container port, please slow down, and reduce the height of the forklift arm from the ground (it is recommended to be 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 re- moved 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.

1.3 Tiger Pro/Tiger Neo container handling requirements and precautions

- 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), must be equal or bigger than the total length of the unloading forklift (L1) and the length of the module packing box (L2) (Figure 7).

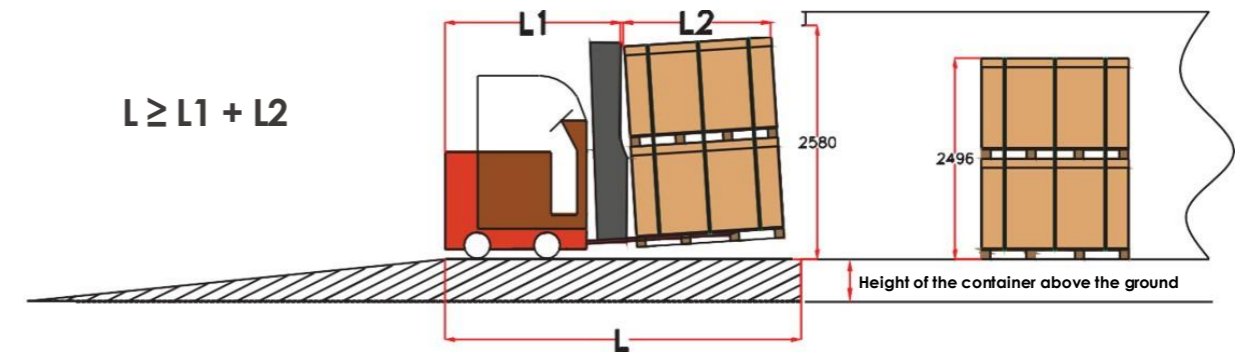


Figure 7

- When the container is unloaded:
When using the fuel forklift, adjust the height of the forks from the ground. Then, when the forks are into the short side of the pallet, and after they reach the bottom, lift the modules at an appropriate height (the tilt angle required to lift the modules must be lower than 2°). The smaller the distance from the ground when the forklift gets out of the container door, ensures 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 80 mm. When the horizontal electric forklift is used to unload the goods, fork arms' length must be $\geq 1800\text{ mm}$. This arm length is required to lift the modules from the short side of the pallet (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 the long side of the pallet, fuel oil forklifts are needed to unload (Figure 8).



Figure 5



Figure 6

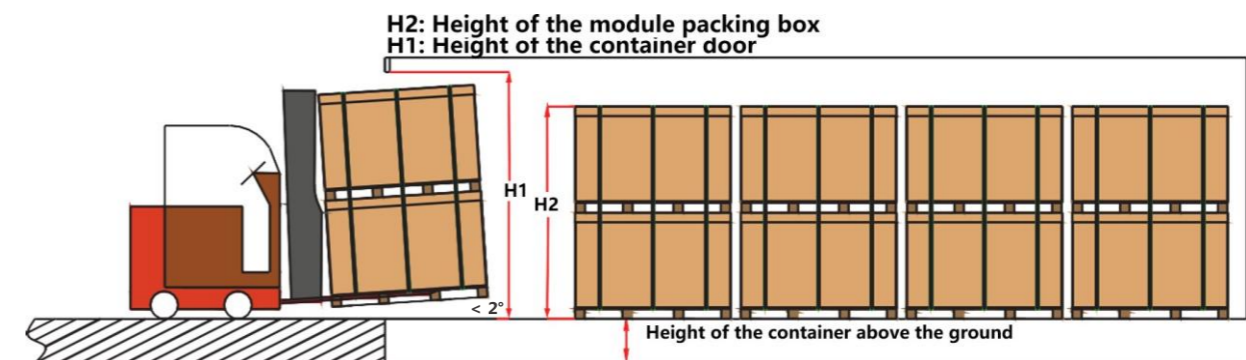


Figure 8

1.4 Attention in loading and unloading with crane

When crane unloading, the chosen hoisting rope should be a longer nylon sling (Figure 9). Wire rope is not allowed to be used.

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 would cause the sling to be too tight and the assembly to explode.

When lifting, the box should be kept balanced to avoid the tilt of the modules.

When someone is required to direct the hoisting box to drop it during unloading, it shall be kept as flat as possible to avoid collision and the modules being thrown, and the ground shall be flat (Figure 10).



Figure 9



Figure 10

To minimize the impact of sling on the safety of goods in the process of hoisting, the modules should be supported during loading and unloading. For example, wooden sticks, boards, iron rods or other elements of the same width as the outer packing boxes should be used on the upper part of the box and in the bottom part of the pallet, to support the sling and reduce the pressure of the contact position on the box and pallet (Figure 11).



Figure 11

2. STORAGE INFORMATION

2.1 Storage Guidelines

Due to the complexity of the environment and climate of most of the project sites, it is recommended to store the stacked modules with a single support after dismantling, 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). Double glass modules should be stored with single support after dismantling.

Modules should be stored in a complete outer package, and the storage area, as well as the pallets and packaging boxes, must be protected from moisture, direct sunlight and rain or water impact.

The modules storage areas should be kept dry and level (angle between the ground and the horizontal plane must be less than 10°).

Make sure all modules with the same current sorting class are installed in the same area centrally (square matrix, combiner box).

Modules should be placed in an orderly manner, keeping a safe distance between the boxes. The spacing between boxes should be greater than 30 cm (Figure 12).

Please do not stack other items on top of the modules or boxes (Figure 13).

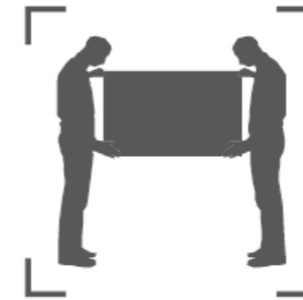


Figure 12



Figure 13

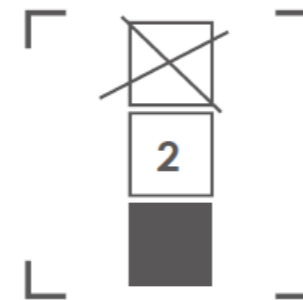
2.2 Handling, storage and transport symbology



MODULE SHOULD BE HANDLED BY 2 PERSONS



KEEP DRY



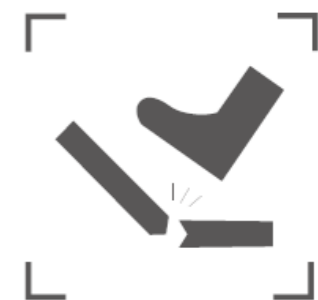
STACK LIMIT IN 2 UNITS



THIS SIDE UP



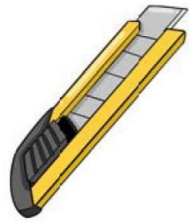
FRAGILE



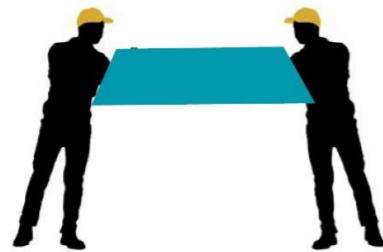
DO NOT STEP ON

3. UNPACKING INSTRUCTION

3.1 Equipment and Tools: Cutter, Gloves, Forklift



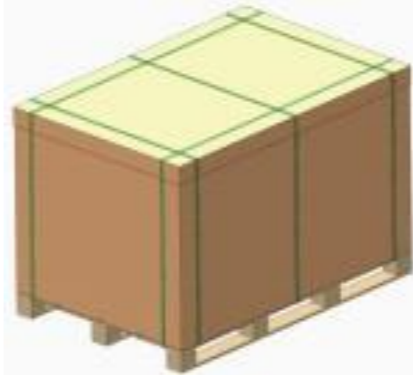
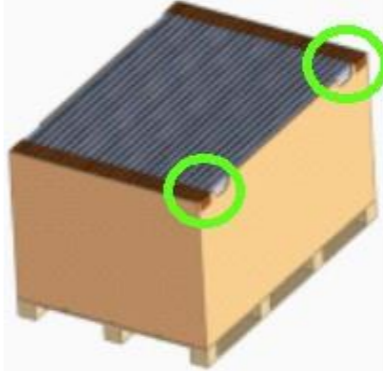
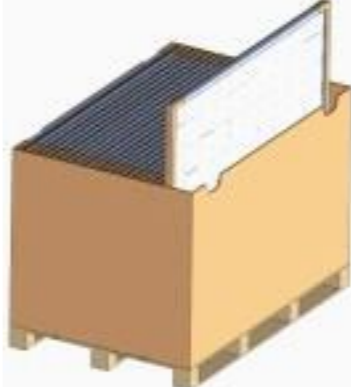

3.2 People: No less than two persons



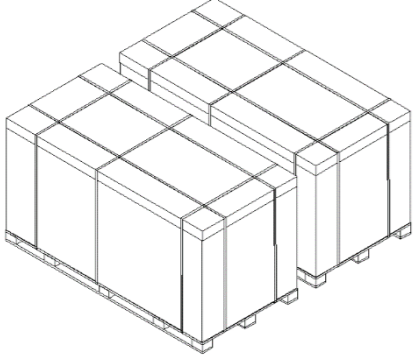
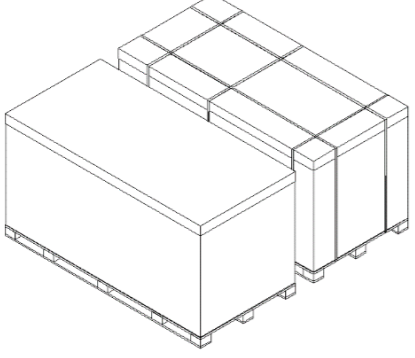
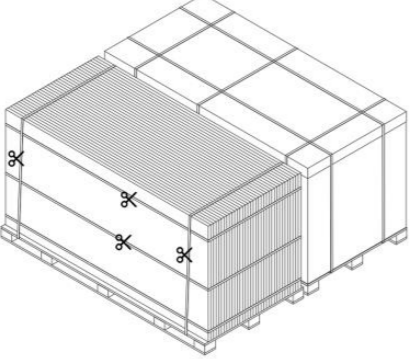
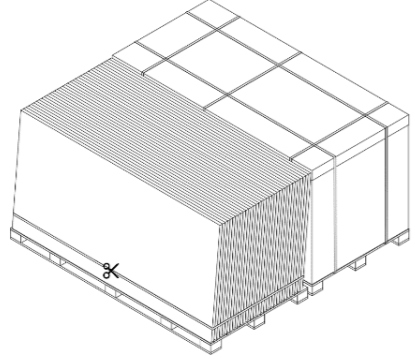
3.3 Module unpacking guideline

Packing method A:

1.		Cut off the straps within the two pallets, and use a forklift to separate them.
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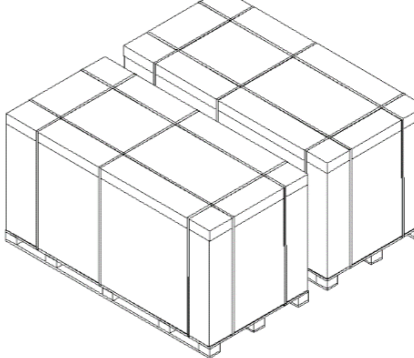
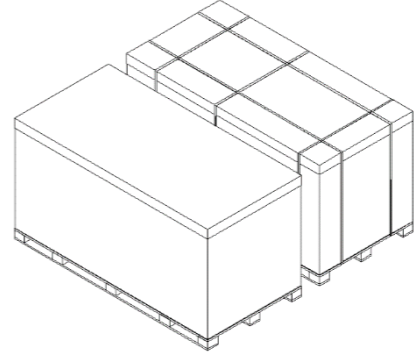
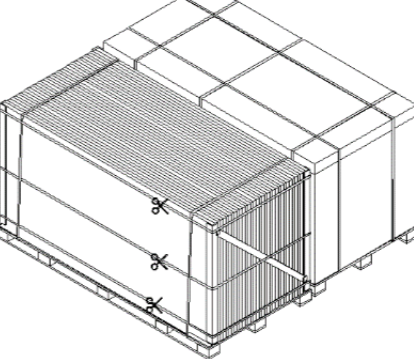
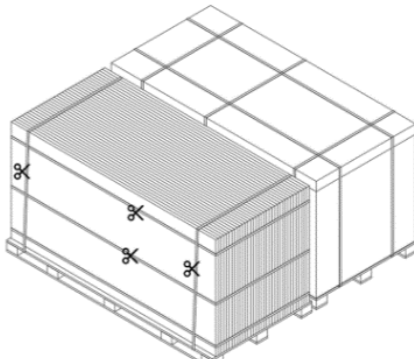
2.		Cut off the packing strap of the single pallet, remove the isolated wood (or plastic wrap) and the carton cover.
3.		First, remove the first module labeled "1" from the opening position (marked in green).
4.		Then remove the remaining modules from the box sequentially.
5.		When there are only 5 modules left in the box, please provide sufficient support on the side of the modules, in order to prevent the carton from tipping over, which would cause an accidental collision.

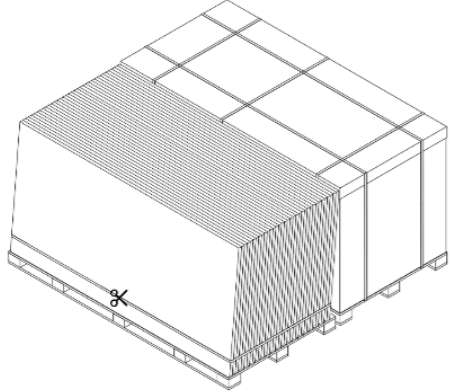
Packing method B, Plan 1 (Conventional Packaging)

1.		<p>Remove the wrapping film around the box and separate the upper and lower boxes.</p>
2.		<p>Leave the long side of the single box about 15-20cm to solid support, such as wall, rack or unpacked module box of the same type. Then use scissors to cut all the packing strap around the single box.</p>
3.		<p>Remove the top cover of the box and then remove the carton by lifting it. Two people must hold the modules to prevent them from tipping over. One of the workers cuts the top 2 horizontal straps and the 2 vertical straps of the modules, keeping the bottom horizontal strap.</p>
4.		<p>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.</p>

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.

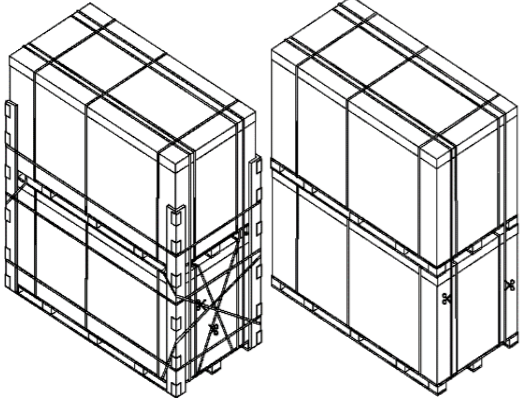
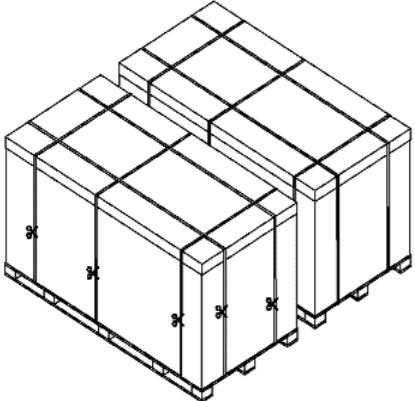
Packing method B, Plan 2 (with internal wooden N-shaped protectors)

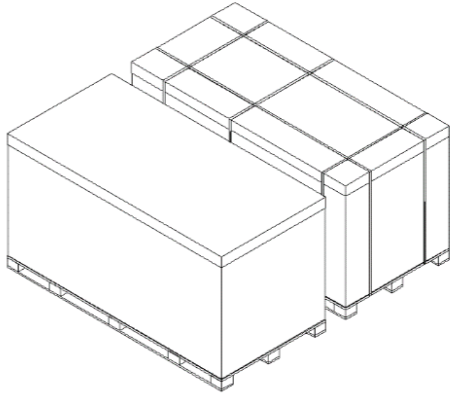
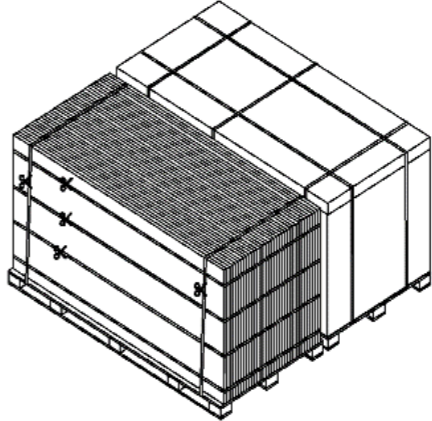
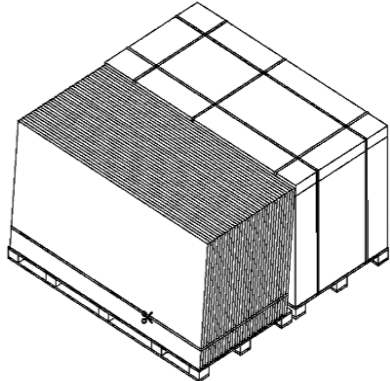
1.		<p>Remove the wrapping film around the box and separate the upper and lower boxes.</p>
2.		<p>Leave the long side of the single box about 15-20cm to solid support, such as wall, rack or unpacked module box of the same type. Then use scissors to cut all the packing strap around the single box.</p>
3.		<p>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.</p>
4.		<p>Two people must hold the modules to prevent them from tipping over. One of the workers cuts the top 2 horizontal straps and the 2 vertical straps of the modules, keeping the bottom horizontal strap.</p>

5.		<p>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.</p>
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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.

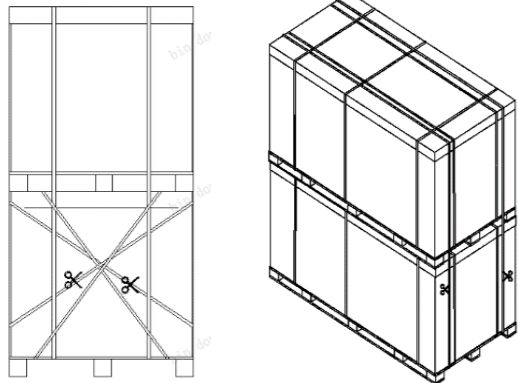
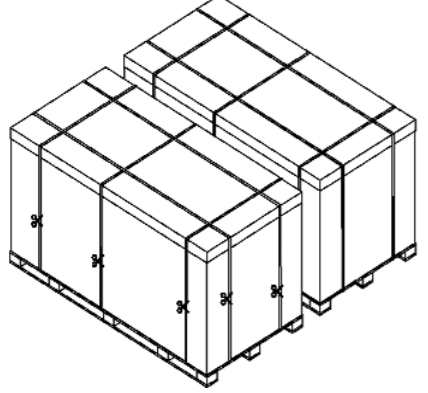
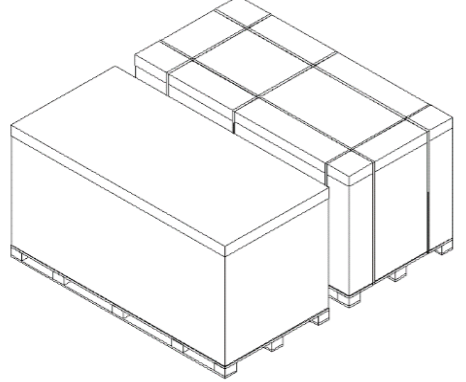
Packing method B, Plan 3 (with exterior wooden protector and cross-packing)

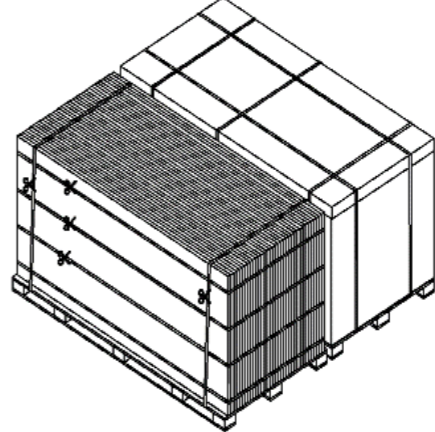
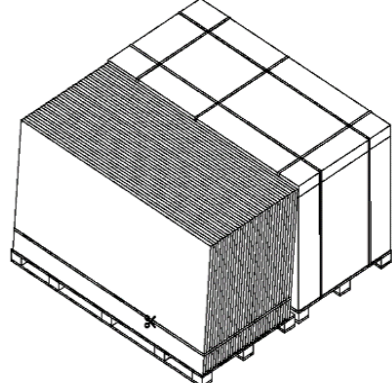
1.		<p>Remove the wrapping film around the box, then cut the cross-packing straps and remove the exterior wooden protector.</p>
2.		<p>Cut the straps of the upper and lower modules packages, then separate the upper and lower modules boxes.</p>

3.		<p>Leave the long side of the single box about 15-20cm to solid support, such as wall, rack or unpacked module box of the same type. Then use scissors to cut all the packing strap around the single box.</p>
4.		<p>Remove the top cover of the box and then remove the carton by lifting it. Two people must hold the modules to prevent them from tipping over. One of the workers cuts the top 3 horizontal straps and the 2 vertical straps of the modules, keeping the bottom horizontal strap.</p>
5.		<p>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.</p>

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.

Packing method B, Plan 4 (exterior cross packing)

1.		<p>Remove the wrapping film around the box, and then cut the cross-packing straps.</p>
2.		<p>Cut the straps of the upper and lower modules packages, then separate the upper and lower modules boxes.</p>
3.		<p>Leave the long side of the single box about 15-20cm to solid support, such as wall, rack or unpacked module box of the same type. Then use scissors to cut all the packing straps around the outer box.</p>

4.		<p>Remove the top cover of the box and then remove the carton by lifting it. Two people must hold the modules to prevent them from tipping over. One of the workers cuts the top 3 horizontal straps and the 2 vertical straps of the modules, keeping the bottom horizontal strap.</p>
5.		<p>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.</p>

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.

4. UNPACKING INFORMATION

4.1 Attention to unpacking

- Do not open cardboard boxes during rainy days, because the cartons will soften and spread out to damage modules after rain.
- Fixed measures shall be taken for disassembled modules when operating outdoors in windy weather. It is advisable not to move the modules to avoid damage.
- Stack modules in a ventilated, waterproof, and dry place before unpacking.
- Use scissors or art knife to cut the outer box packing tape. Do not scratch the glass. Confirm the number of modules in the box immediately after opening the box.
- When leaving a box unattended, support should be placed on the back of the assembly to prevent the modules from collapsing (Figure 14).

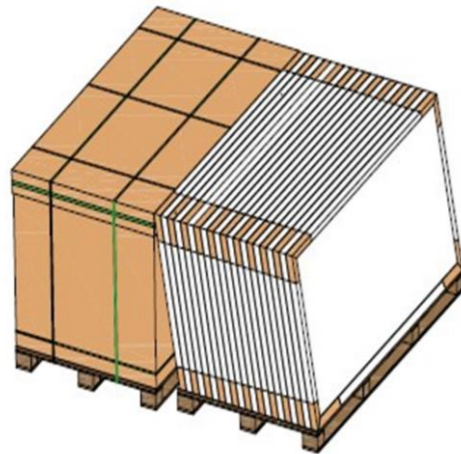


Figure 14

- The working ground must ensure that the packing box can be stably placed horizontally to prevent the modules from tipping over.
- 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 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 your hands or leaving fingerprints on the glass.
- Each module needs to be carried by 2 people. Pulling the junction box is forbidden in any case. When lifting the module, grab the short edge and take out the module (Figure 15).



Figure 15

- Do not remove the corner protection from the modules before installation (For double glass frameless modules there is no need to remove corner protection).
- The remaining modules of the installation should be placed centrally and protected by a packing box.

4.2 Unpacking, handling and sampling at project site

- 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.
- 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 16).
- If the modules need to be spot tested, please refer to the unpacking instructions of this manual 3.3/4.1 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 tipping over (Figure 17).
- 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 18).



Figure 16



Figure 17



Figure 18



Figure 19



Figure 20

- 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 19). 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 20).
 - 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.

5. SAMPLING INSTRUCTION

5.1 Instruction for sampling at the project site

- 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.



- When connecting the connector, do not shake the cable to avoid damaging the module.
- 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.

5.2 Instruction of sample modules

- Sample modules must be selected for sampling with no damage to the outer package.
- 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.