



Upsolar Delivering safe solar

UPSOLAR PV MODULES – PACKING SOLUTIONS

1. PV modules standard dimensions

Type	Mono 72cells	Poly 54cells	Poly 60cells	Poly 72cells
Dimensions (mm)	1580x808x40	1482x992x40	1640x992x40	1956x992x50

2. Packing Quantity (for 40” containers)

Type	Mono 72cells	Poly 54cells	Poly 60cells	Poly 72cells
Pcs / pallet	23	23	23	18
Pallet Gross Weight(kg)	360	410	460	500
Pallets / container	28	28	28	22
Pcs / container	644	644	644	396

3. Wooden pallets dimensions

Type	Mono 72cells	Poly 54cells	Poly 60cells	Poly 72cells
Pallet (mm)	1633x861x120	1535x1045x120	1693x1045x120	2009x1045x120

Remark: one 5mm-thickness plywood board is inserted between 2 pallets to avoid any damaged during transportation

4. Pallet and modules serial numbers signification

➤ Example: Pallet bar code

- UP: Company code
- 2M: Product code
- 016: Manufacturing site code
- 0812: Date code (December 2008)
- 00001: Pallet serial number



➤ Example: Module bar code

- UP: Company code
- 0: Production batch code
- 1: Cells type
- 2: Code referring to the number of cells
- 004: Manufacturing site code
- 081209: Date code (9 December 2008)
- 0001: Production serial number





Remark 1: Pallet number and modules serial numbers are inserted inside a water-proof poly-bag attached on the side of the carton in order to make stock management easy in the manufacturer warehouse and on customer site.

Remark 2: Module serial numbers are encapsulated at the top left corner of each module.

5. Upsolar Current Classification for PV modules

A- Purpose:

When several modules are installed on one string (=series connection), the modules with the lowest current at maximum power (I_{mp}) will penalize the electricity production of the full string. This phenomenon is called performance loss due to current mismatch.

To limit this effect, this is important to verify that all the modules that will be connected on one string are showing similar maximum power current. UPSOLAR propose this service by sorting every module during flash test to avoid complications to the customer during his PV system installation.

B- Classification:

5 current classes have been defined (alpha, beta, gamma, delta and epsilon). The ranges of current for each class are given in the here-under table for the 2 main products families identified in UPSOLAR catalogue: monocrystalline and polycrystalline.

Current class	Alpha (α)	Beta (β)	Gamma (γ)	Delta (δ)	Epsilon (ϵ)
Label					
Ref. UP-MXXXM Monocrystalline	$I_{\alpha} < 5.00A$	$5.00A \leq I_{\beta} < 5.15A$	$5.15A \leq I_{\gamma} < 5.30A$	$5.30A \leq I_{\delta} < 5.45A$	$I_{\epsilon} \geq 5.45A$
Ref. UP-MXXXP Polycrystalline	$I_{\alpha} < 7.65A$	$7.65A \leq I_{\beta} < 7.75A$	$7.75A \leq I_{\gamma} < 7.85A$	$7.85A \leq I_{\delta} < 7.95A$	$I_{\epsilon} \geq 7.95A$

C- Integration to the manufacturing process:

During the flash test in factory, the modules are first sorted per power by excluding from the lot the ones for which the maximum power value is not included in the range of $\pm 3\%$ of the nominal power. Modules are then sorted per current according to the I-V curve values given by the same flash test.

- > One pallet only contents modules of the same current class.
- > A label indicating the current class is stuck on each module frame (see labels format here-above)

N.B: The values given in this document are defined as standard and are susceptible to be adjusted in the future, due to continuous technology improvement.



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6. Flash Reports

A flash report is available for each container shipped. It contains the following information: container number, lead sealing number, pallet code, module type, module serial numbers, electrical parameters, flash test date and current classification.

Container No.: OOLU7462055				Lead sealing No.: ALD9515							
Pallet No.	No.	Type	Serial No.	Pm(W)	Voc(V)	Isc(A)	Vpm(V)	Ipm(A)	FF	Date	Grade
UP4M028090300407	1	UP-M185M	UP0120281008220080	186.7	45.47	5.605	35.69	5.233	0.733	24-08-2010	Iy

	23	UP-M185M	UP0120281008220083	187.8	45.47	5.615	35.83	5.242	0.734	24-08-2010	Iy

7. Upsolar packing process



6 ABS pieces are fixed on each frame to avoid any contact between 2 modules



4 carton protections are inserted at each corner to strengthen and protect the pallet



Once the container is full, air bags are inserted to maintain pallets in position



Each finished pallet is wrapped in plastic film to ensure the pallet integrity