Upsolar Pv Modules – Packing Solutions

2. PV Module Standard DImensions

Type	Mono 72 cells (5 inches)	Mono 60 cells (6 inches)	Poly 54 cells	Poly 60 cells	Poly 72 cells
Dimensions (mm)	1580×808×35	1640×992×35	1482×992×35	1640×992×35	1956×992×40

2. PV Module Standard DImensions

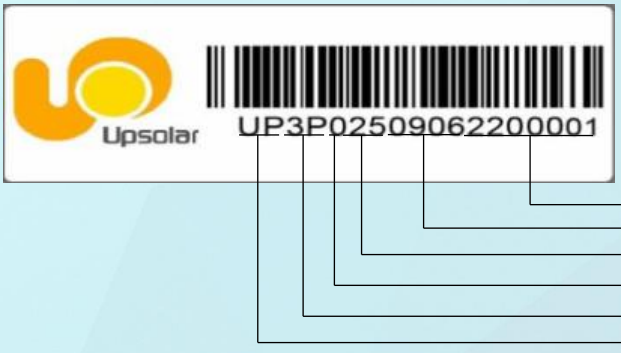
Type	Mono 72 cells (5 inches)		Mono 60 cells (6 inches)			Poly 60 cells			Poly 72 cells		
Container	20GP	40GP	20GP	40HQ		20GP	40HQ		20GP	40HQ	
Pcs / pallet	30		30/22	30	30(+5)	30/22	30	30(+5)	26/20	26	26(+4)
Pallet Gross Weight (kg)	410		600/440	600	600(700)	600/440	600	600(700)	730/560	730	730(810)
Volume/pallet (m^3)	1.75		2.2		2.2(2.6)	2.2		2.2(2.6)	2.6		2.6(3.0)
Pallets / container	12	28	6+6	28	28	6+6	28	28	5+5	22	22
Pcs / container	360	840	312	840	910	312	840	910	230	572	616

1. Packing Solutions

Type	Mono 72 cells (5 inches)	Mono 60 cells (6 inches)		Poly 60 cells		Poly 72 cells
	840pcs	840pcs	616pcs	840pcs	616pcs	**840pcs**
Pallet Dimensions (mm)	**1620×1130×120**	**1680×1130×120**	**1690×1045×125**	**1680×1130×120**	**1690×1045×125**	**2000×1130×120**

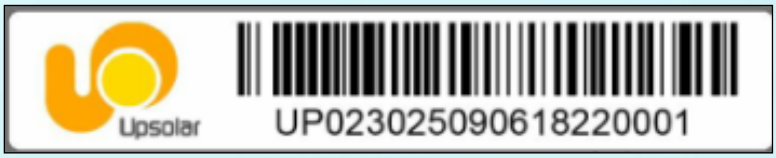
4. Pallet and Module Serial Number

Example: Pallet bar code



2200001: Pallet serial number
0906: Date code (June 2009)
25: Upsolar code
0: JB & Connector code
3P: Product code
UP: Company code

Example: Pallet bar code



220001：Production serial number
090618：Date code (18 June 2009)
25: Upsolar code
0: Frame type code
3: Cell Quantity
2: Cells type
0: JB & Connector code
UP: Company code

Remark 1: Pallet number and module serial numbers are inserted inside a water-proof bag attached on one side of the carton in order to make warehouse management more efficient 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 (Imp) will penalize the electricity production of the full string. This phenomenon is called performance loss due to current mismatch.

To limit this effect, it is important to verify that all the modules that will be connected on one string are showing similar maximum power current. UPSOLAR proposes this service by sorting every module during the 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 table here-under for the 2 main product families identified in UPSOLAR catalogue: monocrystalline and polycrystalline.

Current class	Alpha (α)	Beta (β)	Gamma (γ)	Delta (δ)	Epsilon (ε)
Label	Iα	Iβ	Iγ	Iδ	Iε
Ref. UP-MXXXM Monocrystalline (5-inch cells)	Iα < 5.45A	5.45A ≤ Iβ < 5.55A	5.55A ≤ Iγ < 5.65A	5.65A ≤ Iδ< 5.75A	**Iε ≥ 5.75A**
Ref. UP-MXXXM Monocrystalline (6-inch cells)	Iα < 8.75A	8.75A ≤ Iβ < 8.85A	8.85A ≤ Iγ < 8.95A	8.95A ≤ Iδ< 9.05A	**Iε ≥ 9.05A**
Ref. UP-MXXXP Polycrystalline	**Iα < 8.45A**	**8.45A ≤ Iβ < 8.55A**	**8.55A ≤ Iγ < 8.65A**	**8.65A ≤ Iδ< 8.75A**	**Iε ≥ 8.75A**

C. Integration into the Manufacturing Process

During the flash test in the 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 ± 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 will only content modules of the same current class as a default, while one pallet can be mixed with different current classes in one container.
- A label indicating the current class is stuck on each module frame (see label format here-above)

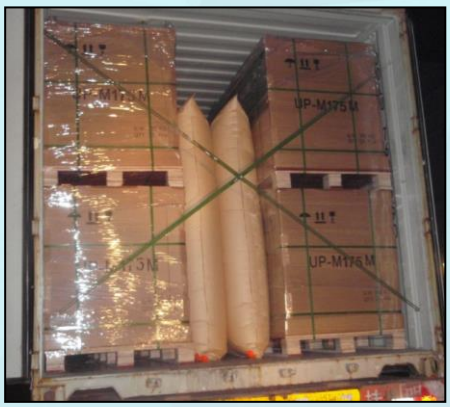
N.B: The values given in this document are defined as standard and are subject to change in the future, due to continuous technology improvement.

6. Flash Reports

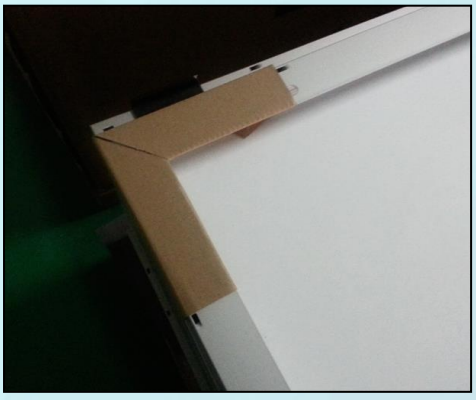
A flash report is available for each container shipped. It contains the following information: container number, lead sealing number, pallet code, module type, module serial numbers, electrical parameters, flash test date and current classification

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	Iγ
	…	…	…	…	…	…	…	…	…	…	…
	23	UP-M185M	UP0120281008220083	187.8	45.47	5.615	35.83	5.242	0 .734	24-08-2010	Iγ

7. Upsolar Packing Process

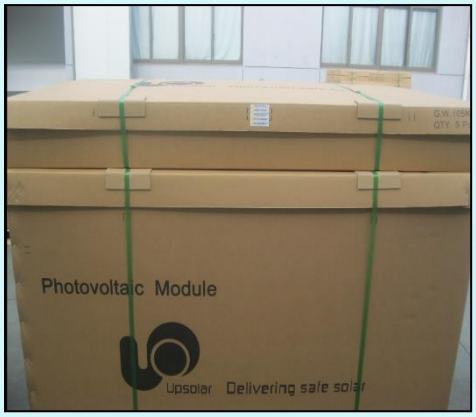


Each finished pallet is wrapped in plastic film to ensure the pallet integrity



Step one: Four paper corners are fixed to each frame to avoid any contact

Step two: Twenty-six modules are vertically placed into the carton for each pallet



Step three: Stack additional carton onto the top of pallet.

Step four: Each finished pallet is wrapped in plastic film to ensure pallet integrity

Step five: Loading into container and fixing with PE belt