

SINCE  
**2016**

# PAHAL

SOLAR

Solar PV Module Manufacturer



**Indo - Japanese Partnership**





## ABOUT US

We are a leading Solar Module Manufacturer and installation firm having JVC with multinational Japanese/Spanish Corporation "UNIVERGY". We offer turnkey services and the latest in technology. We have established ourselves in the domestic as well as international market, providing the best in value and service to our esteem customers. We are also an OEM Company delivering an unmatched quality at a competitive price.

We are the producer of the range of Solar PV Modules starting from 3Wp to 740Wp. We have a fully automatic production line with an annual production capacity of 800MW and aggressively expanding to 1.6 GW



### OUR VISION

Climate change is a "crisis multiplier" that has profound implications for international peace and stability, we have pledged to embark on the journey of saving our endangered planet. Our vision is to add to the effort of channelizing the abundantly available sunlight by producing high-quality and durable solar panels and installing them to harness solar energy.

### OUR VALUES

Educate and empower the end-user is our values. Within this process, we meet our clients to help them define their goals, evaluate their options and make firm and confident decisions. We take care of the entire process from the designing to installation, commissioning, and maintenance so that going solar is a becomes seamless and hassle-free process.

### OUR MISSION

Our mission is to make Solar Installation affordable and sustainable; by doing so its reach can be extended towards the capacity of an ordinary human being, in turn creating a win-win situation and limiting global warming to 1.5°C.



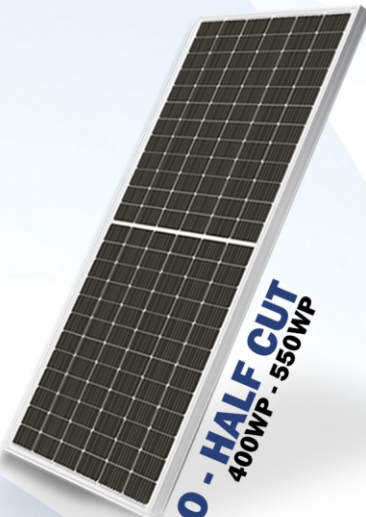
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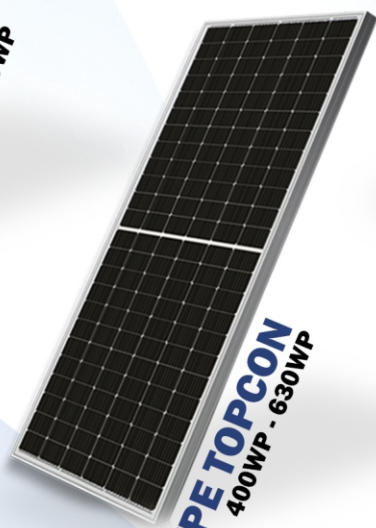
PAHAL SOLAR is Solar PV Module Manufacturer using Monocrystalline and Polycrystalline solar cells



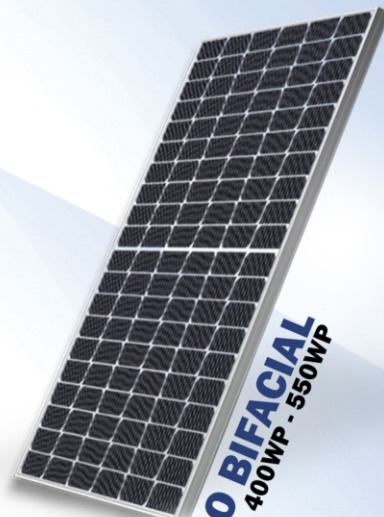
# EXPERT OF SOLAR MODULES



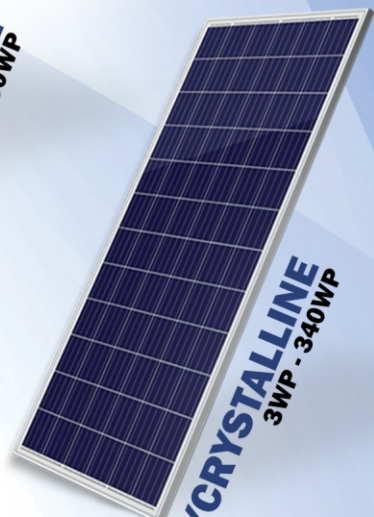
**MONO - HALF CUT**  
400WP - 550WP



**N-TYPE TOPCON**  
400WP - 630WP



**MONO BIFACIAL**  
400WP - 550WP



**POLYCRYSTALLINE**  
3WP - 340WP

## SALIENT FEATURES



SMBB Technology



Pre & Post EL checking to ensure defect free modules.



PID Resistance



High salt mist and ammonia resistance.



IP68 High Quality Junction Box.



Enhanced Mechanical Load

## QUALITY STARS & CERTIFICATIONS



CERTIFICATIONS

LISTED WITH



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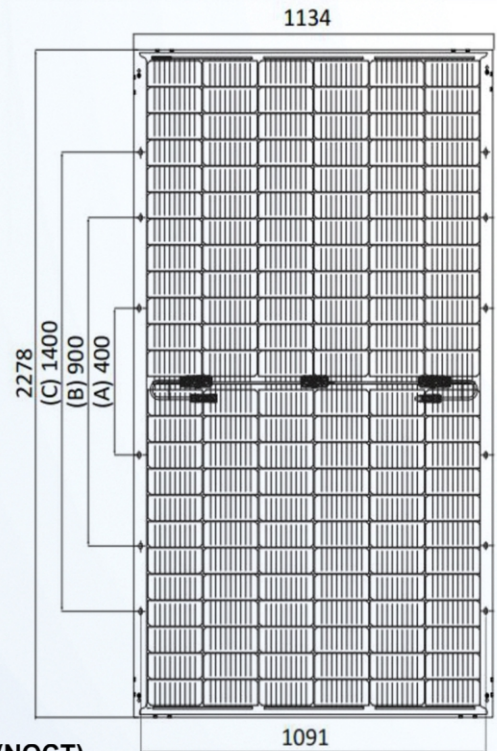
# MONOFACIAL DATASHEET ( 525Wp - 550Wp )

## Electrical Parameters

### ● PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

( Irradiance of 1000 W/m<sup>2</sup>, Spectrum AM 1.5 and Cell Temperature of 25°C )

Model Number	PS_525	PS_530	PS_535	PS_540	PS_545	PS_550
Capacity Rating - Pmax (Wp)	525	530	535	540	545	550
+Ve Power Tolerance (W)	0-5	0-5	0-5	0-5	0-5	0-5
Rated Voltage - Vmp (V)	40.80	40.94	41.10	41.36	41.62	41.87
Rated Current - Imp (A)	12.87	12.95	13.03	13.07	13.10	13.14
Open Circuit Voltage (Voc)	48.87	49.04	49.21	49.41	49.61	49.81
Short Circuit Current (Isc)	13.63	13.76	13.83	13.89	13.94	14.00
Module Efficiency (%)	20.35	20.53	20.73	20.92	21.11	21.30



### ● PERFORMANCE UNDER NOMINAL OPERATING CELL TEMPERATURE (NOCT)

( NOCT Irradiance of 800 W/m<sup>2</sup>, Ambient Temperature of 20°C, Wind speed 1m/s, Average NOCT = 45 ± 2°C )

Capacity Rating - Pmax (Wp)	389	393	396	400	404	407
Rated Voltage - Vmp (V)	38.65	38.81	38.96	39.20	39.45	39.69
Rated Current - Imp (A)	10.05	10.12	10.17	10.20	10.23	10.26
Open Circuit Voltage (Voc)	46.32	46.49	46.65	46.84	47.03	47.22
Short Circuit Current (Isc)	10.64	10.75	10.80	10.84	10.89	10.93

## Temperature Co-efficients

- Tk Isc %/°C 0.0264
- Tk Voc %/°C -0.2316
- Tk Pmax%/°C -0.3106

## Mechanical Specifications

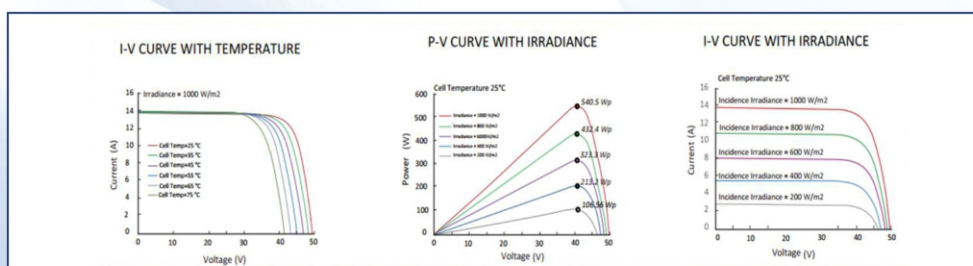
Matrix / No. of Cells	2X12X6/144
Cell Size (mm)	182X91
Cell Busbar	10
Dimensions (LXWXT) (mm)	2278X1134X40
Weight (kg)	28
Frame	Silver Anodized Aluminium Alloy
Glass	ARC Coated Low Iron Tempered
Encapsulant	EVA Sheet (PID free and UV Resistant)
Backsheet	PVDF Based Composite Film
Junction Box	Split JB - IP68, MC4 Compatible
Application Class Rating	Class A
Safety Class Rating	Class II
Mechanical Load Test	5400 Pa - Front / 2400 Pa - Back
X-Pitch (mm)	1091
Y-Pitch (mm)	(A) 400 (B) 900 (C) 1400

## Max. Operating Conditions

- Operating Temperature -40°C to +85°C
- Max.System Voltage 1500 V
- Max.Series Fuse Rating 25 A
- NOCT Temperature 45° ± 2

## Packing Standard

Frame Size	40 mm	
Vehicle	19 ft	32 ft
No. of Modules	192	432
No. of Pallets	8	16
Module per Pallet/Weight	24/672	27/756



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# BIFACIAL DATASHEET ( 525Wp - 550Wp )

## ELECTRICAL PARAMETERS

### PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

( Irradiance of 1000 W/m<sup>2</sup>, Spectrum AM 1.5 and Cell Temperature of 25°C )

Model Number	PS_525	PS_530	PS_535	PS_540	PS_545	PS_550
Capacity Rating - Pmax (Wp)	525	530	535	540	545	550
+Ve Power Tolerance (W)	0-5	0-5	0-5	0-5	0-5	0-5
Rated Voltage - Vmp (V)	40.80	40.94	41.10	41.36	41.62	41.87
Rated Current - Imp (A)	12.87	12.95	13.03	13.07	13.10	13.14
Open Circuit Voltage (Voc)	48.87	49.04	49.21	49.41	49.61	49.81
Short Circuit Current (Isc)	13.63	13.76	13.83	13.89	13.94	14.00
Module Efficiency (%)	20.35	20.53	20.73	20.92	21.11	21.30

### PERFORMANCE UNDER NOMINAL OPERATING CELL TEMPERATURE (NOCT)

( NOCT Irradiance of 800 W/m<sup>2</sup>, Ambient Temperature of 20°C, Wind speed 1m/s, Average NOCT = 45 ± 2°C )

Capacity Rating - Pmax (Wp)	389	393	396	400	404	407
Rated Voltage - Vmp (V)	38.65	38.81	38.96	39.20	39.45	39.69
Rated Current - Imp (A)	10.05	10.12	10.17	10.20	10.23	10.26
Open Circuit Voltage (Voc)	46.32	46.49	46.65	46.84	47.03	47.22
Short Circuit Current (Isc)	10.64	10.75	10.80	10.84	10.89	10.93

## BI-FACIAL : Pmax WITH REAR SIDE POWER GAIN

# Additional power gain from rear side compared to power of front side at STC depends on mounting structure (height, tilt angle, etc) and reflectivity of ground.

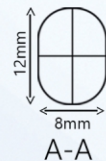
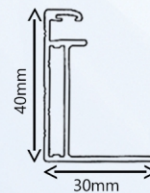
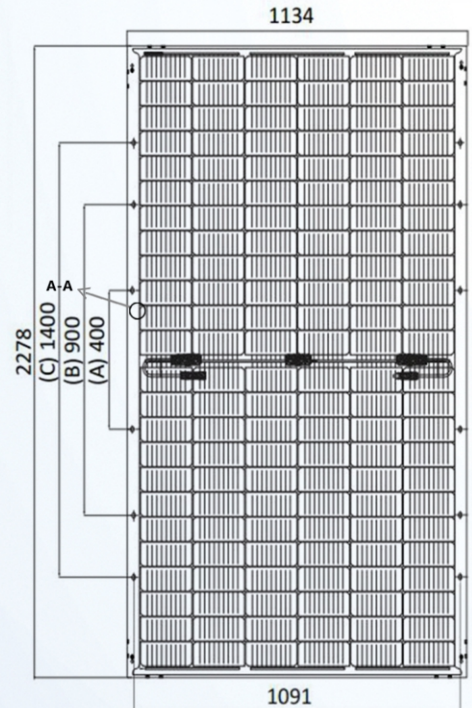
Bi-facial Factor : 70±5%

		PS_525	PS_530	PS_535	PS_540	PS_545	PS_550
5%	Power Output (W)	551	557	562	567	572	578
	Module Efficiency (%)	21.36	21.58	21.78	21.97	22.16	22.38
10%	Power Output (W)	578	583	589	594	600	605
	Module Efficiency (%)	22.40	22.58	22.82	23.01	23.24	23.43
15%	Power Output (W)	604	610	615	621	627	633
	Module Efficiency (%)	23.41	23.63	23.83	24.06	24.29	24.51
20%	Power Output (W)	630	636	642	648	654	660
	Module Efficiency (%)	24.42	24.64	24.88	25.10	25.33	25.56
25%	Power Output (W)	656	663	669	675	681	688
	Module Efficiency (%)	25.43	25.68	25.92	26.15	26.38	26.64
30%	Power Output (W)	683	689	696	702	709	715
	Module Efficiency (%)	26.47	26.69	26.97	27.20	27.46	27.69

## MECHANICAL SPECIFICATIONS

Matrix / No. of Cells	144cell 2(12*6)
Cell Size (mm)	182*91
Cell Busbar	10
Dimensions (LXWXT) (mm)	2278*1134*40
Weight (kg)	28
Frame	Silver Anodized Aluminium Alloy
Glass	ARC Coated Low Iron Tempered
Encapsulant	EVA Sheet (PID free and UV Resistant)
Backsheet	Transparent Backsheet
Junction Box	Split JB - IP68, MC4 Compatible
Application Class Rating	Class A
Safety Class Rating	Class II
Mechanical Load Test	5400 Pa - Front / 2400 Pa - Back
X-Pitch (mm)	1091
Y-Pitch (mm)	(A) 400 (B) 900 (C) 1400

## DRAWING (MEASUREMENTS ARE IN MM)



## TEMPERATURE CO-EFFICIENTS

- Tk Isc %/°c 0.0264
- Tk Voc %/°c -0.2316
- Tk Pmax%/°c -0.3106

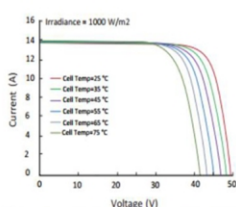
## MAX. OPERATING CONDITIONS

- Operating Temperature -40 °c to +85 °c
- Max.System Voltage 1500 V
- Max.Series Fuse Rating 25 A
- NOCT Temperature 45 ° + 2

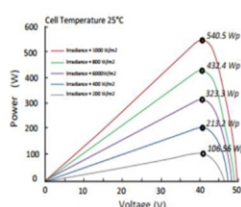
## PACKING STANDARD

Frame Size	40 mm	
Vehicle	19 ft	32 ft
No. of Modules	192	432
No. of Pallets	8	16
Module per Pallet/Weight	24/672	27/756

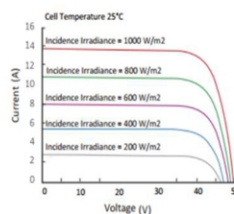
I-V CURVE WITH TEMPERATURE



P-V CURVE WITH IRRADIANCE



I-V CURVE WITH IRRADIANCE



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# TOPCON DATASHEET ( 605Wp - 630Wp )

## ELECTRICAL PARAMETERS

### PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

( Irradiance of 1000 W/m<sup>2</sup>, Spectrum AM 1.5 and Cell Temperature of 25°C )

Model Number	PSN_605	PSN_610	PSN_615	PSN_620	PSN_625	PSN_630
Capacity Rating - Pmax (Wp)	605	610	615	620	625	630
+Ve Power Tolerance (W)	0-5	0-5	0-5	0-5	0-5	0-5
Rated Voltage - Vmp (V)	45.45	45.55	45.65	45.75	45.85	45.90
Rated Current - Imp (A)	13.32	13.40	13.48	13.56	13.64	13.72
Open Circuit Voltage (Voc)	55.04	55.19	55.34	55.49	55.64	55.79
Short Circuit Current (Isc)	14.04	14.11	14.18	14.25	14.32	14.39
Module Efficiency (%)	21.63	21.81	21.99	22.17	22.35	22.53

### PERFORMANCE UNDER NOMINAL OPERATING CELL TEMPERATURE (NOCT)

( NOCT Irradiance of 800 W/m<sup>2</sup>, Ambient Temperature of 20°C, Wind speed 1m/s, Average NOCT = 45 ± 2°C )

Capacity Rating - Pmax (Wp)	455	459	463	466	470	474
Rated Voltage - Vmp (V)	43.01	43.10	43.20	43.29	43.39	43.48
Rated Current - Imp (A)	10.59	10.65	10.71	10.78	10.84	10.90
Open Circuit Voltage (Voc)	52.08	52.23	52.37	52.51	52.65	52.79
Short Circuit Current (Isc)	11.16	11.21	11.27	11.32	11.38	11.44

## TOPCON : Pmax WITH REAR SIDE POWER GAIN

# Additional power gain from rear side compared to power of front side at STC depends on mounting structure (height, tilt angle, etc) and reflectivity of ground.

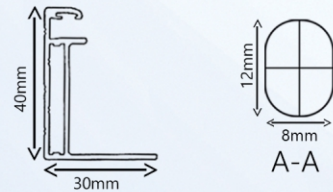
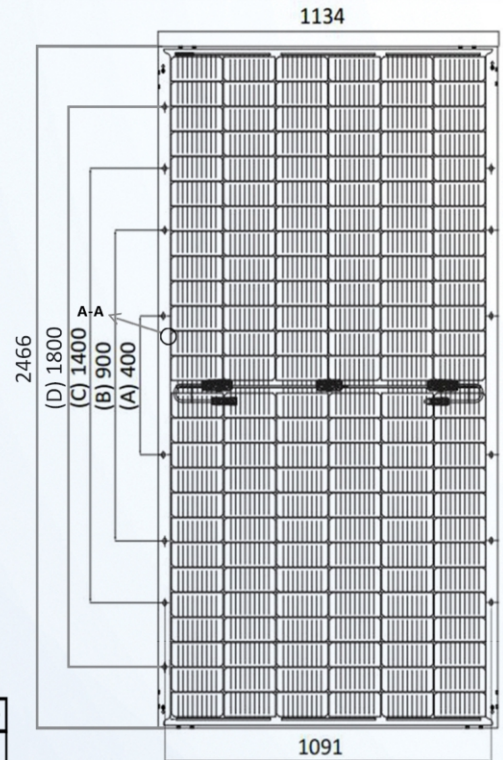
**Bi-facial Factor : 70±5%**

		PSN_605	PSN_610	PSN_615	PSN_620	PSN_625	PSN_630
<b>5%</b>	Power Output (W)	635	641	646	651	656	662
	Module Efficiency (%)	22.71	22.90	23.09	23.28	23.47	23.66
<b>10%</b>	Power Output (W)	666	661	671	682	688	693
	Module Efficiency (%)	23.79	23.99	24.19	24.39	24.59	24.78
<b>15%</b>	Power Output (W)	696	702	707	713	719	725
	Module Efficiency (%)	24.87	25.08	25.29	25.50	25.70	25.91
<b>20%</b>	Power Output (W)	726	732	738	744	750	756
	Module Efficiency (%)	25.96	26.17	26.39	26.60	26.82	27.04
<b>25%</b>	Power Output (W)	756	763	769	775	781	788
	Module Efficiency (%)	27.04	27.26	27.49	27.71	27.94	28.16
<b>30%</b>	Power Output (W)	787	793	800	806	813	819
	Module Efficiency (%)	28.12	28.35	28.59	28.82	29.06	29.29

## MECHANICAL SPECIFICATIONS

Matrix / No. of Cells	156 cell 2(13*6) / N-type (Topcon)
Cell Size (mm)	182*91
Cell Busbar	10
Dimensions (LXWXT) (mm)	2466*1134*40
Weight (kg)	30
Frame	Silver Anodized Aluminium Alloy
Glass	ARC Coated Low Iron Tempered
Encapsulant	EVA (POE) (PID free and UV Resistant)
Backsheet	Transparent Backsheet
Junction Box	Split JB - IP68, MC4 Compatible
Application Class Rating	Class A
Safety Class Rating	Class II
Mechanical Load Test	5400 Pa - Front / 2400 Pa - Back
X-Pitch (mm)	1091
Y-Pitch (mm)	(A) 400 (B) 790 (C) 1400 (D) 1800

## DRAWING (MEASUREMENTS ARE IN MM)



## TEMPERATURE CO-EFFICIENTS

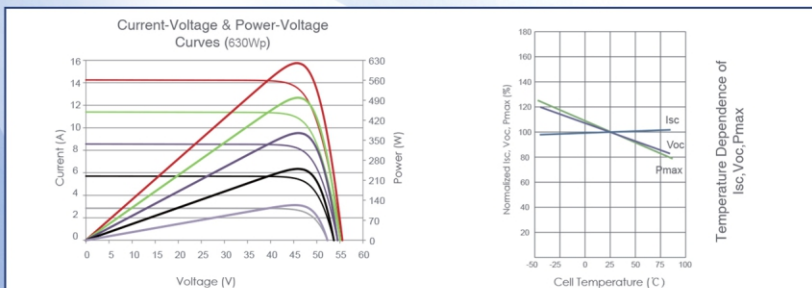
- Tk Isc %/°c 0.045
- Tk Voc %/°c -0.25
- Tk Pmax%/°c -0.29

## MAX. OPERATING CONDITIONS

- Operating Temperature -40 °c to +85 °c
- Max.System Voltage 1500 V
- Max.Series Fuse Rating 25 A
- NOCT Temperature 45 ° + 2

## PACKING STANDARD

Frame Size	40 mm	
Vehicle	19 ft	32 ft
No. of Modules	192	432
No. of Pallets	8	16
Module per Pallet/Weight	24/672	27/756

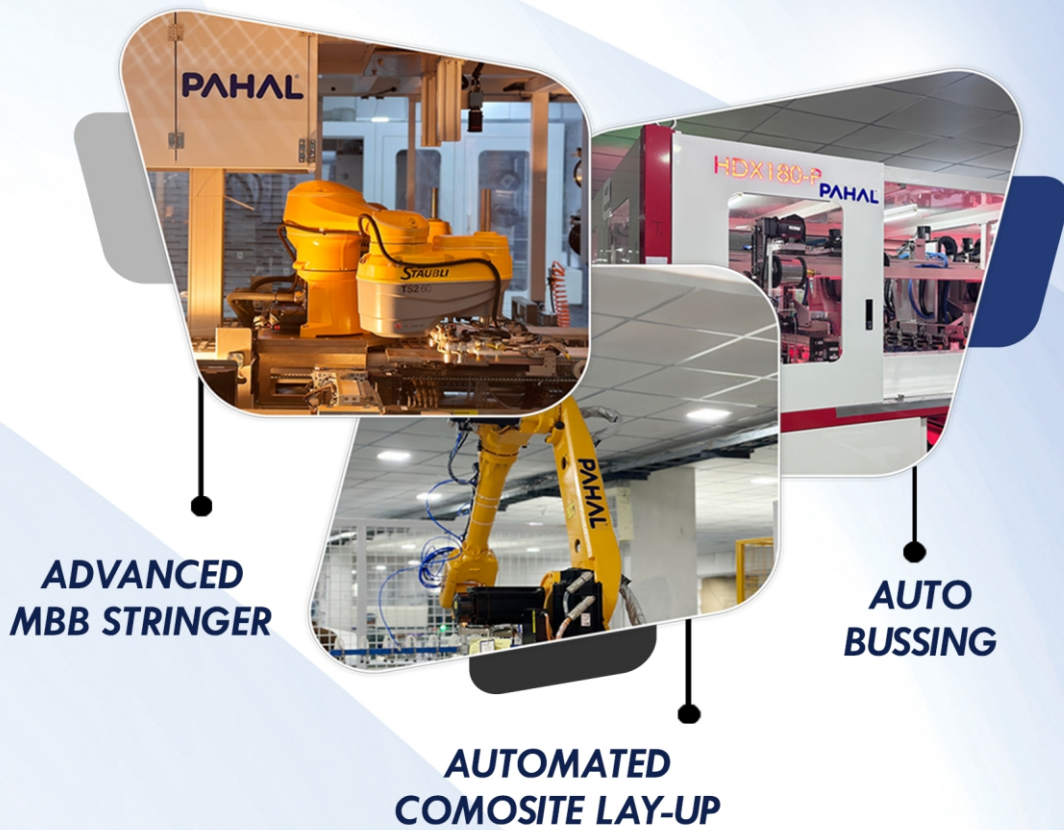


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# COMPANY FEATURES



**ADVANCED  
MBB STRINGER**

**AUTO  
BUSSING**

**AUTOMATED  
COMPOSITE LAY-UP**



**Indo - Japanese Partnership**





# OUR REACH

## GLOBAL

JAPAN | SPAIN | ZIMBABWE | USA | AFRICA



### OVERSEAS PARTNERS



### FACTORY

BLOCK - 71 , OLPAD-SAYAN ROAD, OPP. SHIV SHAKTI ESTATE,  
ATODARA, OLPAD, SURAT - 394540 GUJARAT , INDIA

#### OFFICE (JAPAN)

HALIFAX BIDG., 6F, 3-16-26, ROPPONGI MINATO KI,  
TOKYO-106-0032 JAPAN

#### OFFICE (SPAIN)

C/SERRANO 41, 70 DCHA, 28001, MADRID,  
SPAIN

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 90816 13100

 [www.pahalsolar.com](http://www.pahalsolar.com)

 [info@pahalsolar.com](mailto:info@pahalsolar.com)