

# TP SOLAR LTD

A **TATA** Enterprise



**4.3 GW**  
**SOLAR CELL & MODULE**  
**MANUFACTURING PLANT**

TECHNICAL BOOKLET

# ABOUT US

TP Solar Limited, Tata Power's Solar Manufacturing Arm and a wholly owned subsidiary of Tata Power Renewable Energy Ltd. is India's largest single – location cell & module manufacturing plant located in Gangaikondan, Tamil Nadu. It is contributing towards India's solar energy and net-zero goals. The state-of-the-art facility is equipped with advanced TOPCon and Mono Perc technology, enabling high-efficiency production of solar cells and modules. TPREL's investment in this cutting-edge technology aligns with its vision of fostering innovation and self-reliance in the renewable energy sector.

The company has committed nearly ₹4300 crore towards the establishment of this facility. It is a cornerstone of Tata Power's strategy to lead India's renewable energy transition. The modules produced from this factory are a part of the Government's Approved List of Models and Manufacturers (ALMM).

The solar cells and modules produced at the Tamil Nadu facility will initially cater to the company's ongoing projects, further strengthening its supply chain. With an eye on future expansion, Tata Power also plans to explore opportunities for wider market distribution. In addition to the Tirunelveli plant, the company also operates a world-class manufacturing facility established in 1992 in Bengaluru, Karnataka. This facility, has a production capacity of 682 MW for solar modules and 530 MW for solar cells.

Catering to a plethora of customer segments, our unrivalled manufacturing expertise opens the door to tailor-made, cutting-edge solar solutions. Embrace the epitome of solar panel performance and dependability, as our products undergo rigorous quality checks and comprehensive material characterization, ensuring a superior Tier-1 bankable solar panel and module generation.

As a foremost solar PV module creator, TP Solar Ltd. is committed to delivering top-notch efficiency and durability throughout our wide array of configurations, power outputs, and module sizes. Proudly collaborated with prestigious organizations such as TUV and UL, our international recognition is testament to our relentless pursuit of excellence.

TP SOLAR LTD, SIPCOT Industrial Park, Gangaikondan, Tirunelveli, Tamil Nadu.  
tpsolarltd@tatapower.com



## MODULE MANUFACTURING

Tata Power Renewable Energy's module manufacturing process follows a highly automated and precision driven approach to ensure high quality and good efficiency.

- The module manufacturing process begins with plating copper (Cu) round ribbons with solder and connecting the silver bushbars in a process known as Tabbing and Stringing. (*Tabbing and Stringing refers to the process of connecting the silver bushbars on the front surface of one cell and to the rear surface of the adjacent cell.*)
- These interconnected set of cells are then arranged face-down on a sheet of glass covered with a sheet of polymer encapsulant.
- A second sheet of encapsulant is placed on the top, followed by a tough polymer back sheet (G2BS design) or another piece of glass (G2G Design).
- This stack of material is then laminated in an oven to make the module waterproof.
- It is then fitted with an aluminum frame, edge sealant, and a junction box in which the ribbons are connected to diodes that prevent any backward flow of electricity.
- These modules are then tested at Standard Test conditions (STC) of Temperature and Irradiance using Class A+A+A+ Sun Simulator and sorted according to Panel output Power.



## CELL MANUFACTURING

Solar cells are the heart of a solar module. The manufacturing of Mono PERC (Passivated Emitter and Rear Contact) solar cells involves a series of highly precise and controlled steps to enhance efficiency and performance.

TPREL Cell manufacturing processes are supported by 100% AGV (Automatic Guided Vehicle) based wafer handling through MES.

Tata Power Renewable Energy's cell manufacturing process involves -

- Crystalline Silicon wafer preparation
- Texturing
- Cleaning
- Emitter diffusion
- Oxide deposition
- Rear passivation layer deposition (SiNx),
- Aluminum back surface field (BSF) deposition,
- Laser based Contact Opening,
- Screen printing of front contacts and
- Sintering.

Every solar cell then undergoes rigorous quality testing, before they are classified on their performance.

A key feature of TPREL's Mono PERC Cell Technology is the addition of a rear passivation layer on the back of the cell. This significantly improves light absorption and reduces electron recombination, leading to higher efficiency, as compared to standard monocrystalline solar cells.

<b>Mono Facial: Glass-white back sheet</b>					<b>Certifications</b>				
S.No	Cell matrix	Product tech	Module power rage	Product model	BIS	IEC	UL	CEC	PVEL
1	72	P-Mono PERC	500-555	TP500HG10-TP555HG10	✓	✓	✓		
2	78	P-Mono PERC	500-600	TP555LG10 -TP600LG10	✓	✓	✓		
<b>Bifacial: Glass-Transparent back sheet</b>					BIS	IEC	UL	CEC	PVEL
1	72	P-Mono PERC	500-555	TP500HG10TB-TP555HG10TB	✓	✓	✓	✓	
2	78	P-Mono PERC	500-600	TP555LG10TB-TP600LG10TB	✓	✓	✓	✓	
<b>Dual Glass Bifacial : Glass-Glass</b>					BIS	IEC	UL	CEC	PVEL
1	72	P-Mono PERC	500-555	TP500HG10B-TP555HG10B	✓	✓	✓	✓	✓
2	78	P-Mono PERC	500-600	TP555LG10B-TP600LG10B	✓	✓	✓	✓	
<b>Dual Glass Bifacial : Glass-Glass</b>					BIS	IEC	UL	CEC	PVEL
1	72	n-TOPCon	570-590	TP500HG10B-TP555HG10B	✓	✓	✓	✓	
2	78	n-TOPCon	590-620	TP555LG10B-TP600LG10B	✓	✓	✓	✓	
<b>Dual Glass Bifacial : Glass-Glass (Rectangular Wafer Type: UP COMING)</b>					BIS	IEC	UL	CEC	PVEL
1	66	n-TOPCon	580-600	TP580RG10B-TP600RG10B					

**Legends:**

BIS: Indian Standard

IEC: International Certification

UL: US Certification

CEC: California (US) Certification



# Best In Class Bifacial Modules

## 4 GW Modules & 4 GW Cells

TP540HG10B



Glass - Glass

182 mm, Half - Cut  
144 Nos, 530W - 550W  
(2278 x 1134) mm

TP540HG10TB



Glass - Transparent  
Backsheet

182 mm, Half - Cut  
144 Nos, 530W - 550W  
(2278 x 1134) mm

TP580HG10NB



Glass - Glass  
TOPCon

182 mm, half - Cut  
144 Nos, 560 - 580 W  
(2278 x 1134) mm

TP600LG10B



Glass - Glass

182 mm, Half - Cut  
156 Nos, 570W - 600W  
(2456 x 1134) mm

With over three decades of state-of-the-art manufacturing expertise, Tata Power Solar shines as a trailblazing global solar manufacturer with an unwavering commitment towards fostering robust supply chain practices.

# Illuminating A Sustainable Future



Trust



Reliability



Longevity



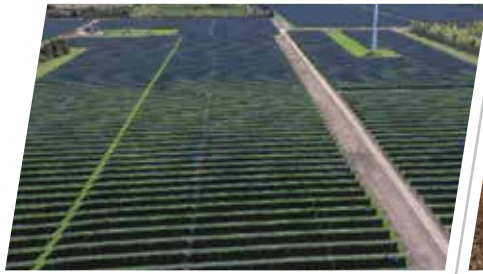
**Embracing Diversity and Inclusivity**

1<sup>st</sup> solar manufacturing plant in India  
with **80%** women operators

**Spanning  
Worldwide and  
National Horizons**

100 MW, NTPC Anantapur

400 MW, Pavagada Solar Plant

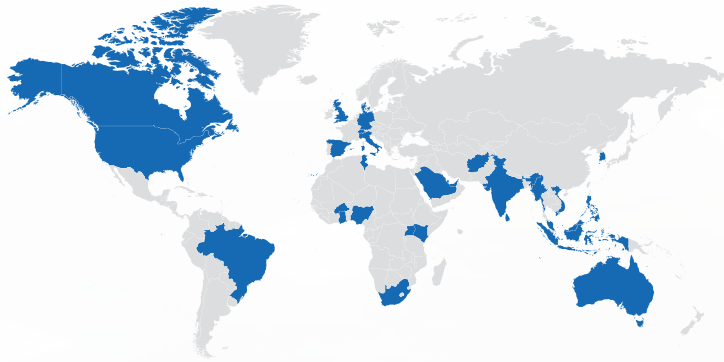


59MWp, Nees, Denmark

3.8MWp, Herzogenrath, Germany

5MWp, Lagness, Chichester, UK

**Over 3 GW  
Modules Installed**



### Aalingana: Embracing Sustainability

Aalingana, 'embrace' in Sanskrit, embodies over 150 years of the Tata group's vision for a greener, cleaner, more sustainable and equitable future for the planet.



Touched over **55 million** lives



Carbon offset by **30 million** tons



Zero liquid discharge plant with **70 acres** of green space

**SUSTAINABLE  
DEVELOPMENT  
GOALS**



**International certifications :**

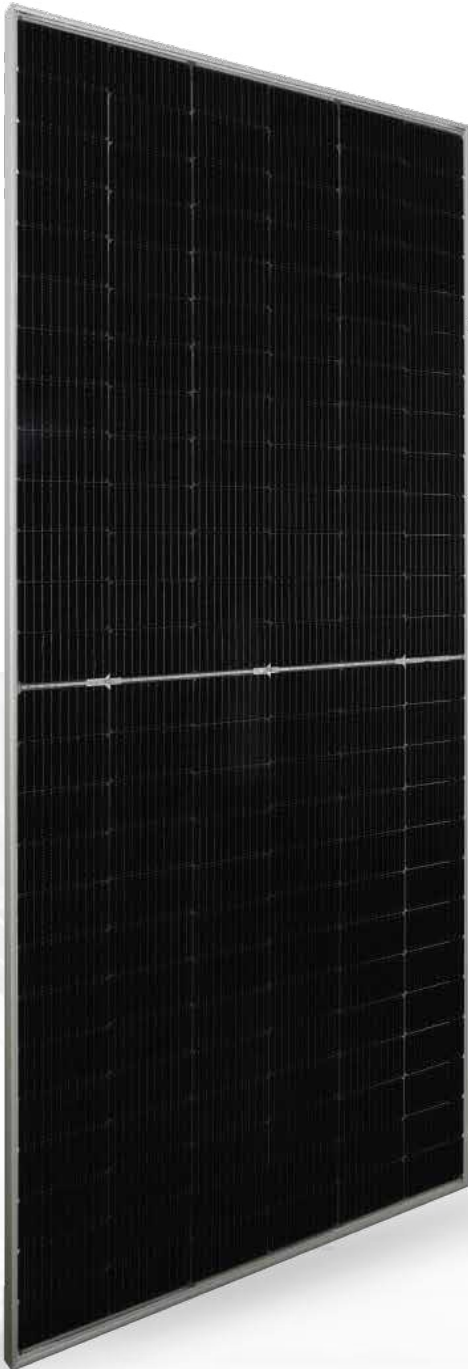
ISO 9001, ISO 14001 & ISO 45001

IEC 61215, 61730, 61701, 62716, 60068, UL61730



# TP540HG10B (Glass - Glass)

## MONO PERC BIFACIAL SOLAR MODULE



**Made in India** within a state-of-the-art module production facility.



Low risk of failure - A warranty claim rate of under **0.07%**.



Certified to withstand snow loads of up to **5400Pa**.



Industry leading heavy-duty frame **6005-T6** grade.



**PID** resistant module.



**IP68** rated junction box.



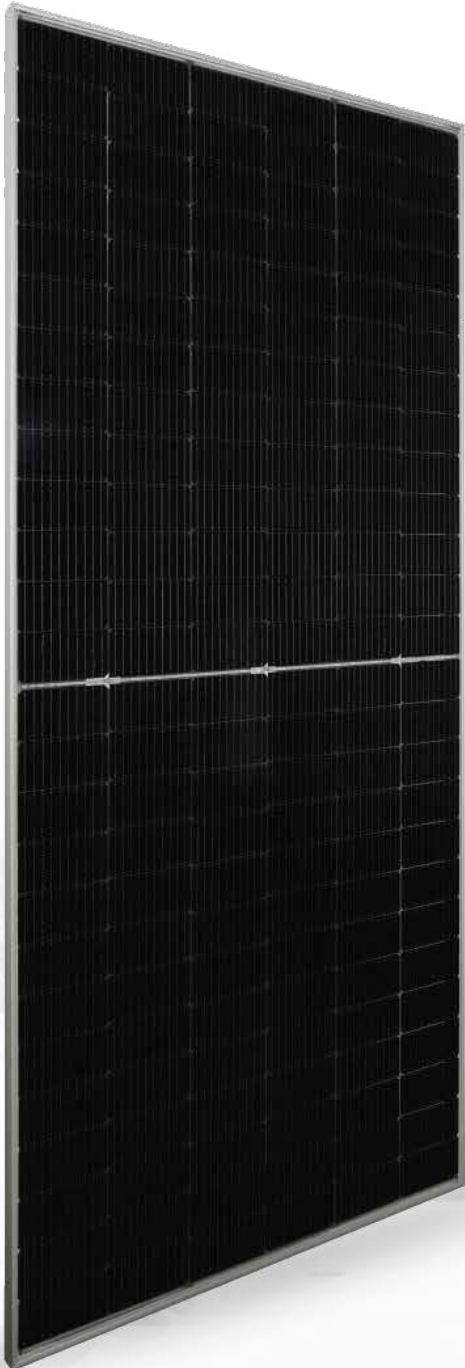
Warranties are subject to the terms and conditions as per the TP Solar warranty document. Certification may vary by module type.





# TP580H G10NB (Glass – Glass)

## TOPCon BIFACIAL SOLAR MODULE



### Illuminating a Sustainable Future



**Made in India** within a state-of-the-art module production facility.



Low risk of failure - A warranty claim rate of under **0.07%**.



\* Certified to withstand snow loads of up to **5400Pa**.



Industry leading heavy-duty frame **6005-T6** grade.



\* **PID** resistant module.



**IP68** rated junction box.

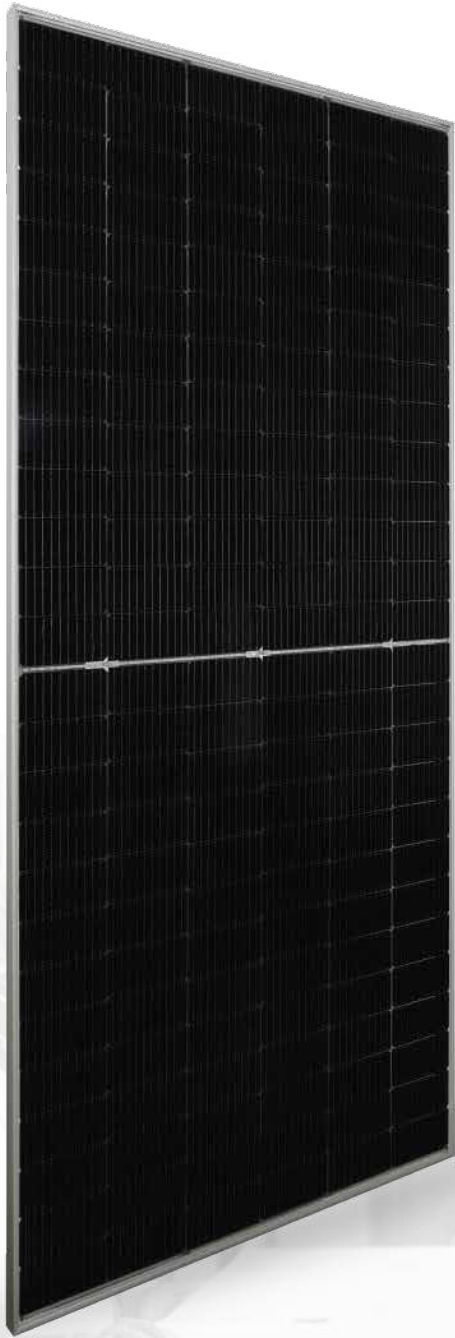


Warranties are subject to the terms and conditions as per the TP Solar warranty document. Certification may vary by module type.

\* Under testing



# TP600LG10B (Glass – Glass) MONO PERC BIFACIAL SOLAR MODULE



## Illuminating a Sustainable Future



**Made in India** within a state-of-the-art module production facility.



Low risk of failure - A warranty claim rate of under **0.07%**.



Certified to withstand snow loads of up to **5400Pa**.



Industry leading heavy-duty frame **6005-T6** grade.



**PID** resistant module.



**IP68** rated junction box.



Warranties are subject to the terms and conditions as per the TP Solar warranty document. Certification may vary by module type.



# TP SOLAR LTD

A **TATA** Enterprise

Plot No. A104-A109, SIPCOT Industrial Park, SIPCOT Road,  
Gangaikondan, Tirunelveli, TamilNadu 627352

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