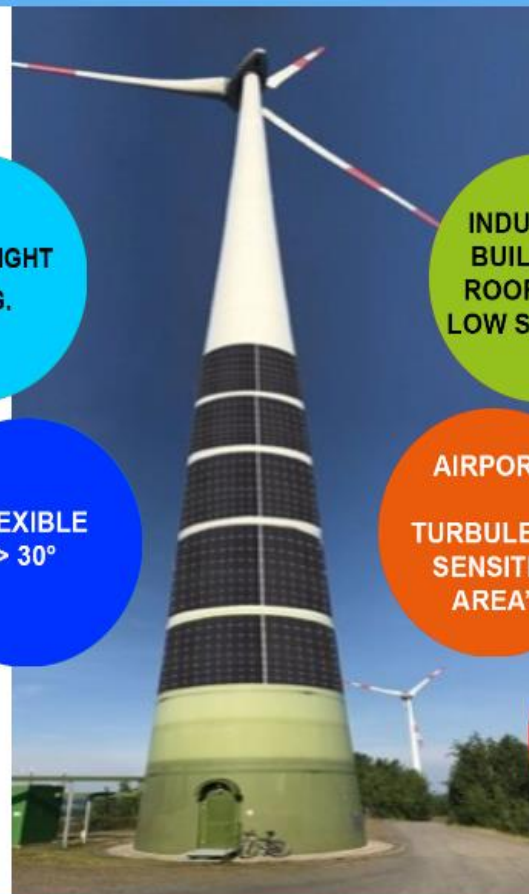




**M.S.I.E.**

# WE DON'T SELL PRICES, WE SELL SOLUTIONS FLEXIBLE THIN SOLAR FILM

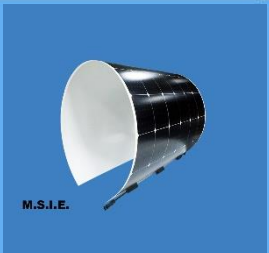


## ADVANTAGES



M.S.I.E.  
Blue Point Building  
August Reyerslaan 80  
1030 Brussels  
BELGIUM

msie@sunportmsie.eu  
☎ +32 466 36 08 88



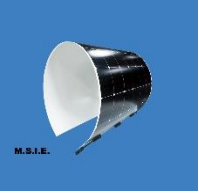
M.S.I.A.  
4 Battery Road,  
Singapore 049908  
SINGAPORE

msie@sunportmsie.eu  
☎ +32 466 36 08 88

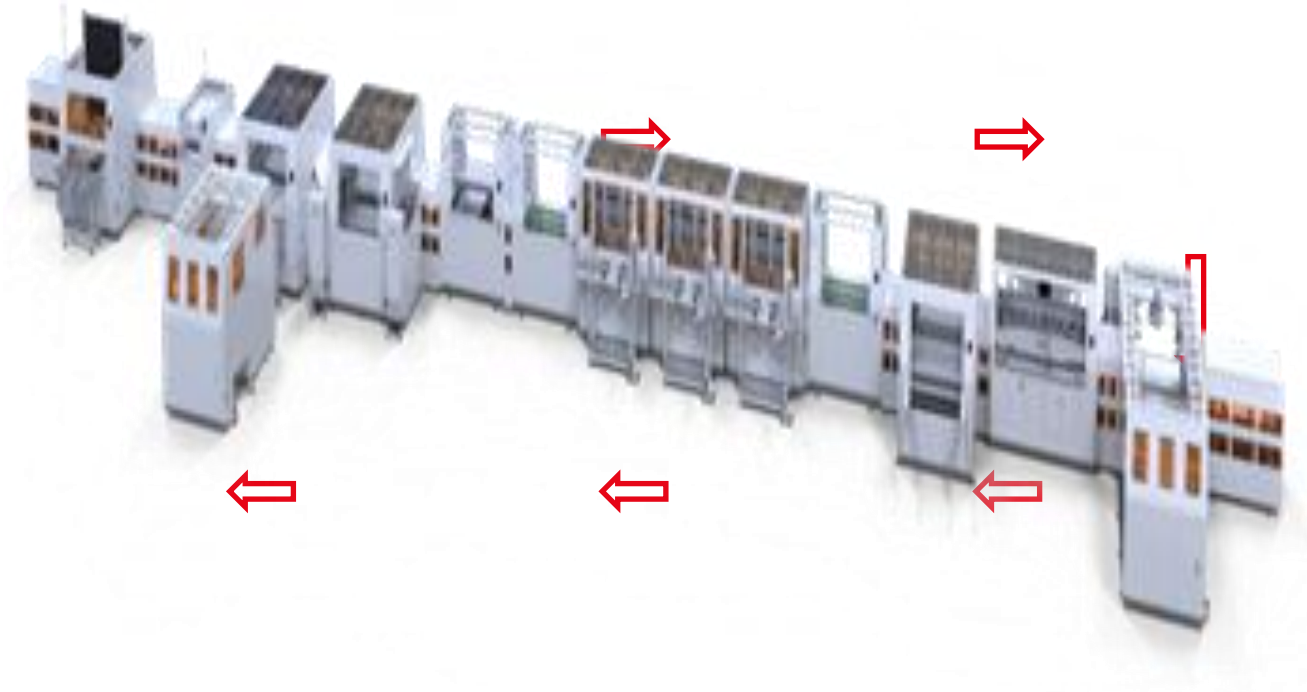


M.S.I.E.  
78 Moo 5 Ban Non-Wai Tai  
Tombol Non Wua So  
Chenwat 41220  
THAILAND

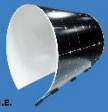
msie@sunportmsie.eu  
☎ +32 466 36 08 88



# Factory 160 MW

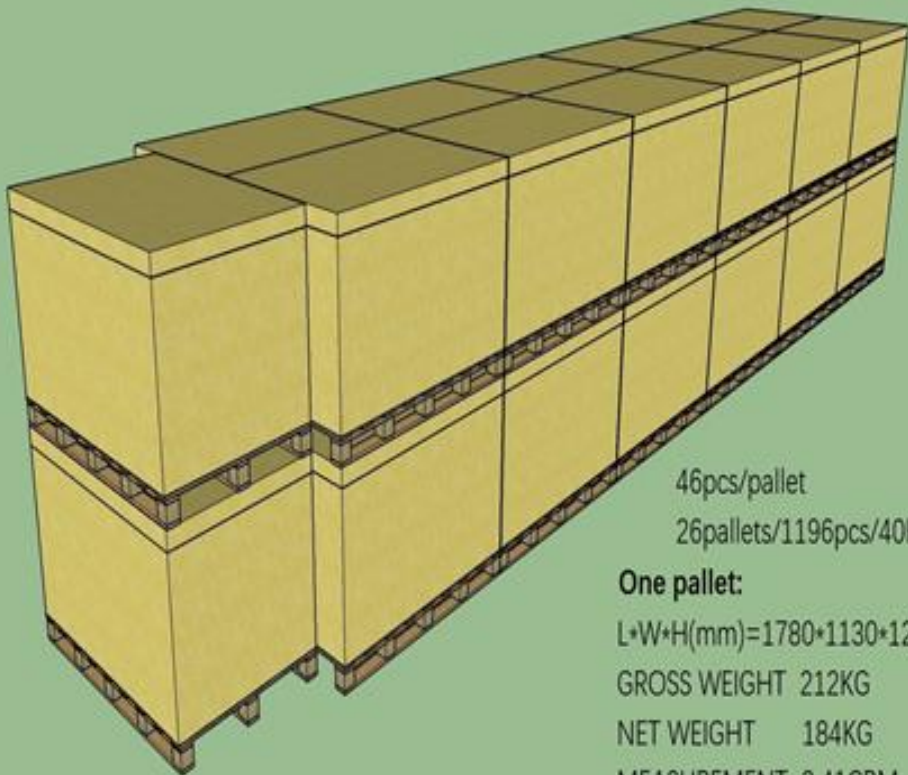
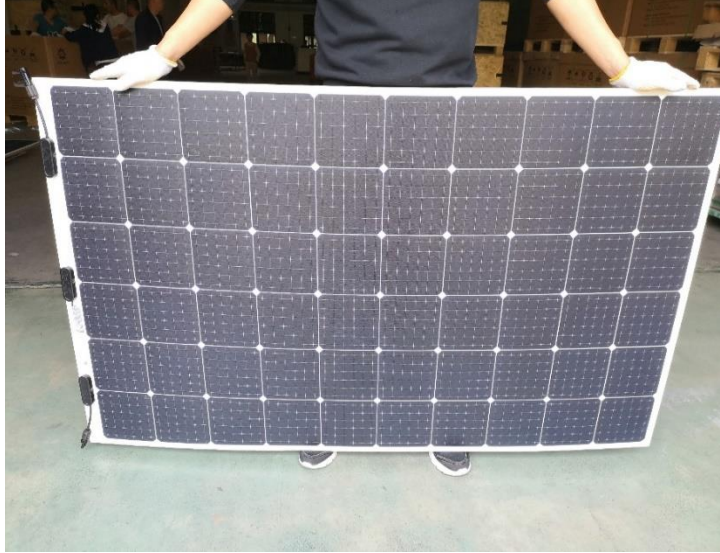


Industry-leading production line



# Company introduction

- Founded 2007 in Asian, 2018 in Belgium,
- coming up Factory Tunisia
- Liaison office in Singapore & New-York
- R & D in Holland O & M in Belgium
- Tunisia: factory 160MW/year production capacity, option to scale to 1,4 GW/year



46pcs/pallet

26pallets/1196pcs/40HQ

**One pallet:**

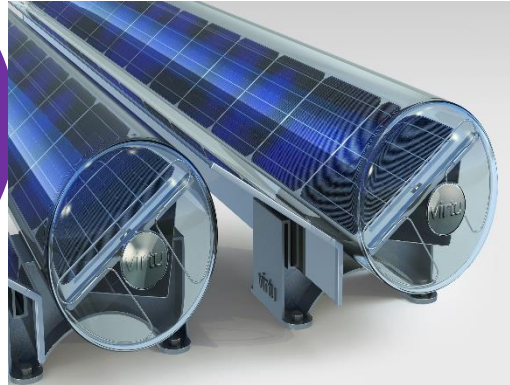
L\*W\*H(mm)=1780\*1130\*1200

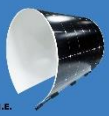
GROSS WEIGHT 212KG

NET WEIGHT 184KG

MEASUREMENT 2.41CBM







# INDUSTRIAL & RETAILERS

# FRIDGE TRUCKS SKYCRAPERS



## PUBLIC BUSES



## SPORTHALL



## HERITAGE BUILDING



## RAILWAY

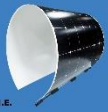


## BARGES



## AIRPORT ROOF

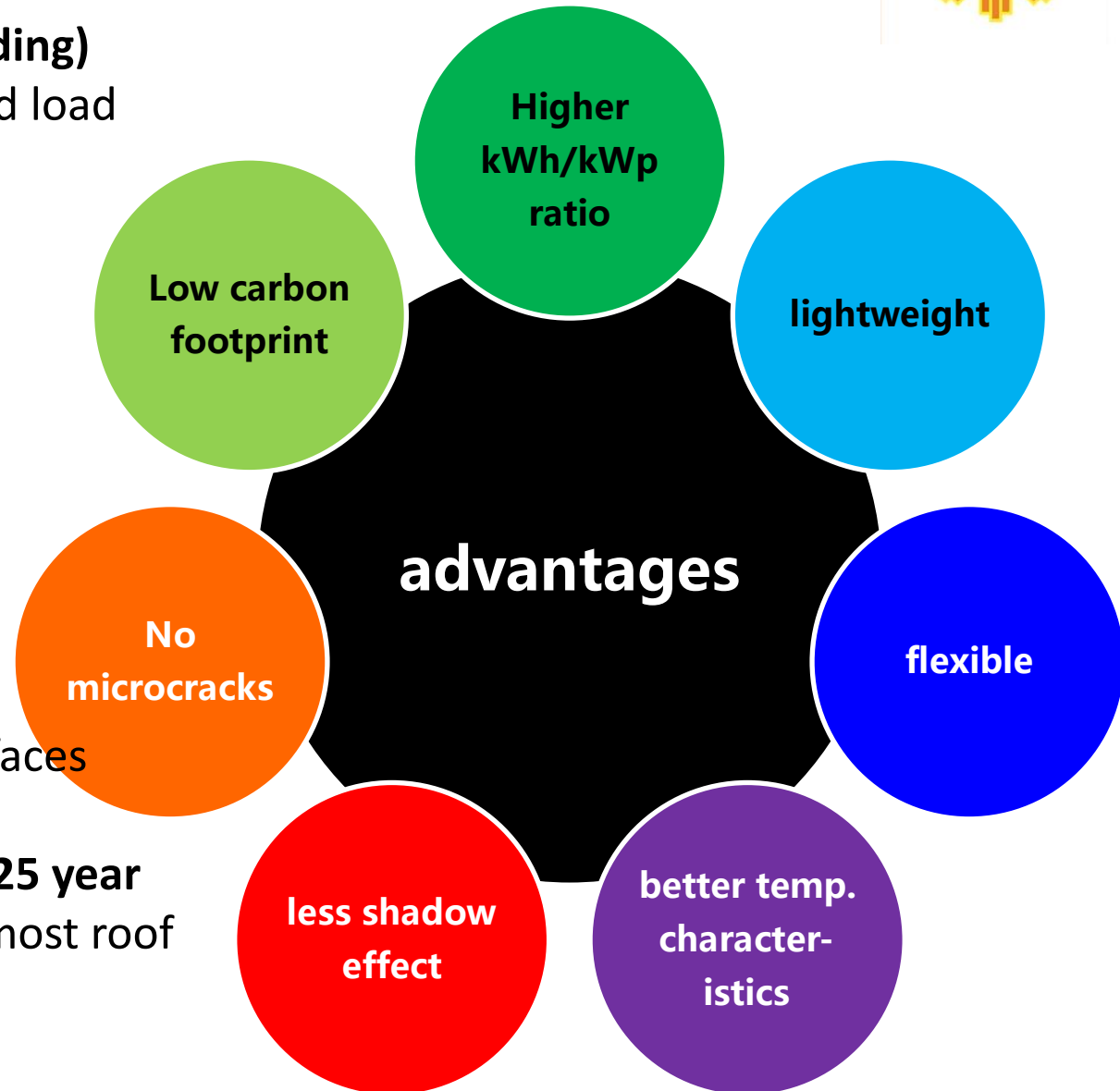


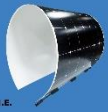


# Specifics flexible MWT modules



- **Lightweight (2,4 kg/m<sup>2</sup> including)**
  - ✓ Constructions with limited load bearing capacity
  - ✓ Low transportation costs
  - ✓ Easy vertical transport
- **Flexible**
  - ✓ No micro cracks
  - ✓ Earthquake proof
  - ✓ Vibration proof
  - ✓ Walkable
  - ✓ Low risk on transport
  - ✓ Applicable on curved surfaces
- **Economic life expectancy of 25 year**
  - ✓ Same life expectance as most roof types

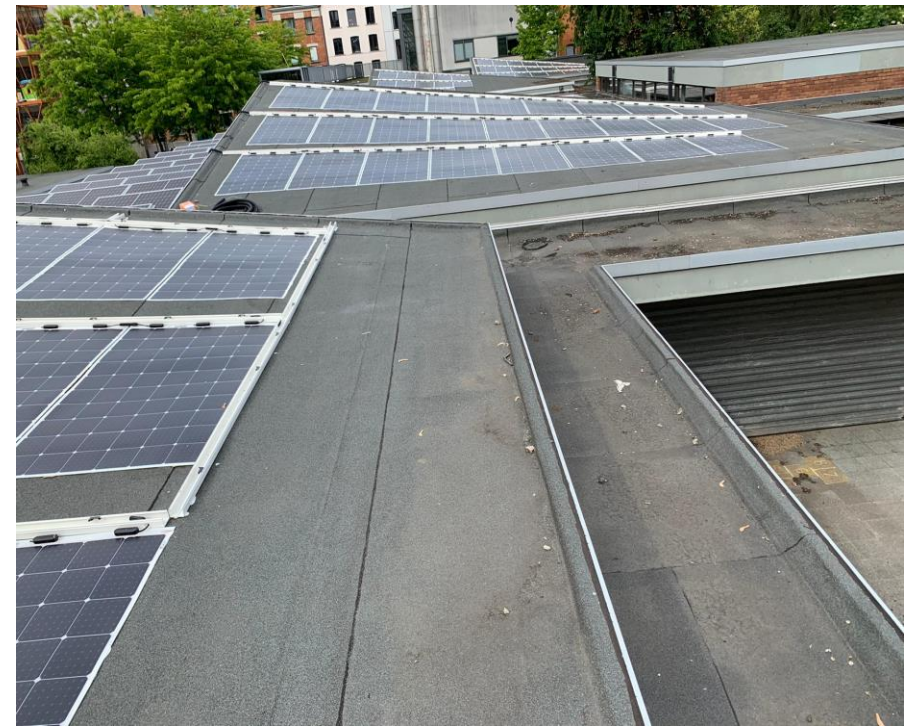




# Specifics flexible MWT modules



- **Compatible with different types of surfaces**
  - ✓ **Flat roofs:** Wide version  
Compatible with TPO/FPO/EPDM/modified bitumen
  - ✓ **Metal roofs:** Narrow version  
Compatible with metal/coated surfaces
- **Instant gluing to the surface**
  - ✓ No extra mounting material
  - ✓ 20% -25% up to 40 % less labour costs
  - ✓ Vandalism/theft proof
  - ✓ No penetrations of the membrane
  - ✓ No extra wind/snow load
  - ✓ No self shading
- **Aesthetics**
  - ✓ Modules fit between metal standing seam roofing elements





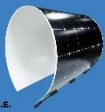
# Specifics flexible MWT modules



- **Good shadow tolerance**
  - ✓ Only the percentage of covered area will affect the output.
  - ✓ Leaves and soiling have hardly any influence
- **High efficiency**
  - ✓ Up to 30 % cell efficiency production
- **Good performance at low irradiation**
  - ✓ Less influence of bad orientation and tilt
  - ✓ Good performance in cloudy weather
  - ✓ Good performance at sunset/sunrise







# Installation



Benchmark II  
SPP290-320M60S



## Benchmark II SPP290--320M60S 290-320W High Efficiency Flexible PV Module Mono 60 Cells



### Flexible PV Module



**Flexible**  
Flexible polymer materials and MWT PCB packaging technology.



**Easy Installation**  
Installation cost is reduced by about 50%.



**High efficiency**  
The highest efficiency of the series is up to 19.5%.



**Attractive design**  
Specially designed grid feature, nice-looking.



**Ultra thin**  
The PV Module thickness is only 1.4mm.



**Heat-Resistant**  
Temperature coefficient is low to  $-0.36\%/^{\circ}\text{C}$ . More power output in hot environment.



**Light weight**  
Weight is reduced by more than 70%.



**Anti-PID**  
With specific treatment, PV module passed strict PID test, no PID risk.

### MWT Back Contact Solar Cell

- New cell structure and different manufacturing process.
- No bus-bar on the front. 3% less shadow and better use of sunlight.
- Effectively avoid the micro crack caused by the pressure between cell edge and ribbon.
- Compatible with other cell types including PERC, HIT, Black Silicon etc.

### Comprehensive System & Product Certification

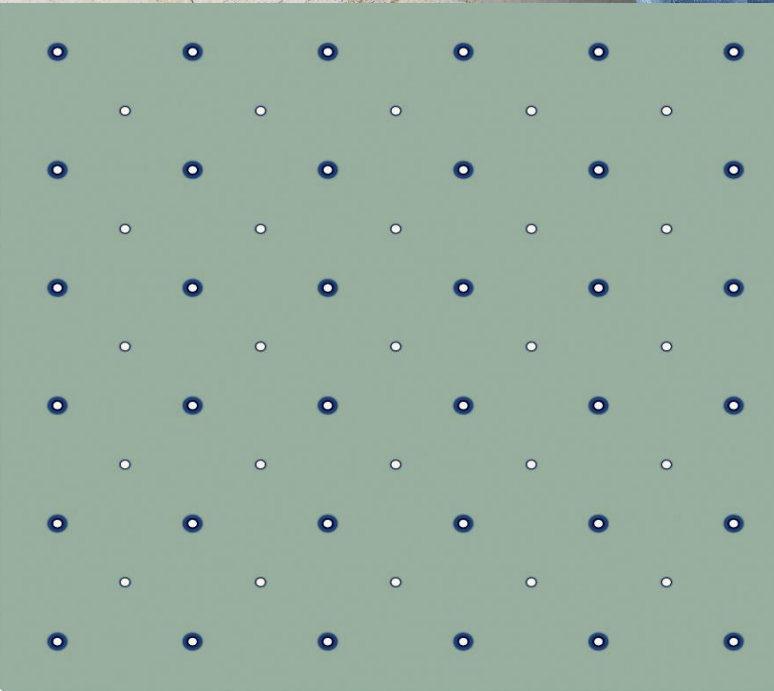
- ★ ISO 9001 : 2015 Quality Management System
- ★ ISO 14001 : 2015 Environment Management System
- ★ OHSAS 18001 : 2007 Occupation Health Safety Management System
- ★ TUV NORD Certification

Insured by PICC  
**PICC**





# Products – M.S.I.E.



Spec / Model	Unit	SPP290M60S	SPP295M60S	SPP300M60S	SPP305M60S	SPP310M60S	SPP315M60S	SPP320M60S
Max-Power(Pm)	W	290	295	300	305	310	315	320
Power Tolerance	%	0~+3%						
Max-Power Voltage(Vm)	V	31.2	31.4	31.6	31.8	32.0	32.2	32.4
Max-Power Current(I <sub>m</sub> )	A	9.30	9.40	9.50	9.60	9.69	9.79	9.88
Open-Circuit Voltage(V <sub>oc</sub> )	V	38.4	38.6	38.8	39.0	39.2	39.4	39.6
Short-Circuit Current(I <sub>sc</sub> )	A	9.50	9.58	9.66	9.74	9.82	9.90	9.98
Module Efficiency(η <sub>m</sub> )	%	17.6	18.0	18.3	18.6	18.9	19.2	19.5

STC:AM=1.5, Irradiance 1000W/m<sup>2</sup>, Module Temperature 25°C

## Typical Eletrical Characteristics at Nominal Module Operating Temperature (NMOT)

Spec / Model	Unit	SPP290M60S	SPP295M60S	SPP300M60S	SPP305M60S	SPP310M60S	SPP315M60S	SPP320M60S
Max-Power(Pm)	W	216	220	224	228	232	236	240
Max-Power Voltage(Vm)	V	28.5	28.7	28.9	29.1	29.3	29.5	29.7
Max-Power Current(I <sub>m</sub> )	A	7.58	7.67	7.76	7.84	7.93	8.01	8.09
Open-Circuit Voltage(V <sub>oc</sub> )	V	35.5	35.6	35.7	35.8	35.9	36.0	36.1
Short-Circuit Current(I <sub>sc</sub> )	A	7.65	7.74	7.85	7.93	8.04	8.12	8.22

NMOT:Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, wind speed 1m/s

## Thermal Characteristics

Nominal Module Operating Temperature	43 ± 2°C
Temperature coefficient of P <sub>max</sub>	-0.36%/°C
Temperature coefficient of V <sub>oc</sub>	-0.28%/°C
Temperature coefficient of I <sub>sc</sub>	0.06%/°C

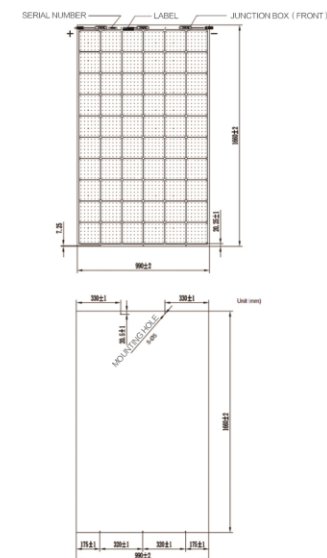
## Operating Conditions

Max. system voltage	DC1000V(IEC)
Max. series fuse rating	15A
Operating temperature range	-40°C ~ +85°C
Bending radius	≥0.20m

## Mechanical Characteristics

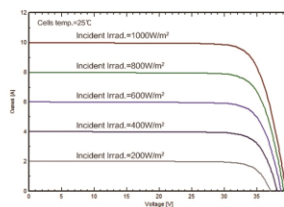
Dimension(L × W × H)	1660mm×990mm×1.4mm
Weight	4.0 kg
Back material	Backplane(white, transparent, black)
Cell (quantity/material/type/dimensions)	60(10x6)/ Monocrystalline-PERC/6 inches
Encapsulant (material)	EVA
Frame	None
Junction box(protecton degree)	IP68
Cable (length/cross-section area)	Customize by customer/4mm <sup>2</sup>
Connector	MC4 Compatible

## Dimensions



## I-V Curves

I-V Curves of SPP310M60S1 at different irradiance



I-V Curves of SPP310M60S1 at different cell temperature

