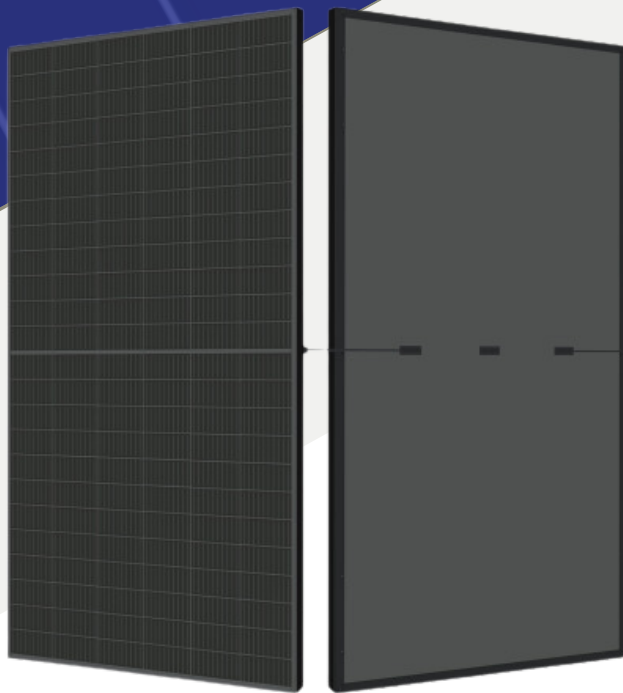


TOPSUN

# ALL BLACK

HIGH PERFORMANCE  
MONOCRYSTALLINE  
N- TYPE TECHNOLOGY

120



## TOP - 470/490M-120AB

**120 CELL**  
Mono N - Type Module

**470 - 490Wp**  
Power Output Range

**1500VDC**  
Maximum System Voltage

**22.70%**  
Maximum Efficiency

### KEY SALIENT FEATURES



Industry leading lowest thermal co-efficient of power



Industry leading 15 years product warranty



Excellent low irradiance performance



Excellent PID resistance



Positive power tolerance of 0~+3%



Fully automated production at all stages



Fully Reduced power loss by minimizing the effect of shadow shading ( 9 - 18 Busbar)



European Warranty & After - Sales Service



### TAMESOL BUILDING A GREEN FUTURE S.L

TAMESOL is a global provider of high-efficiency PV panels with a 10GW annual production capacity and a 100% automated production line, innovating state-of-the-art products for over 15 years. Our panels have been installed in more than 50 countries, with over 20 million panels already connected to the grid.

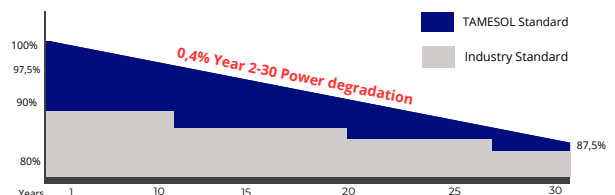
Tel : +34 872 222 388

E - mail: [info@tamesol.com](mailto:info@tamesol.com) Website: [www.tamesol.com](http://www.tamesol.com)

**TAMESOL**  
Energia para vivir

### LINEAR PERFORMANCE WARRANTY

15 year Product Warranty / 30-Year Linear Power Warranty



*Since 2007, building a green future*

<b>22,70%</b> MAX MODULE EFFICIENCY	<b>0 - 3%</b> POWER TOLERANCE	<b>2,0%</b> FIRST YEAR POWER DEGRADATION	<b>0,50%</b> YEAR 2-30 POWER DEGRADATION	<b>N-TYPE CELL</b> Lower operating temperature
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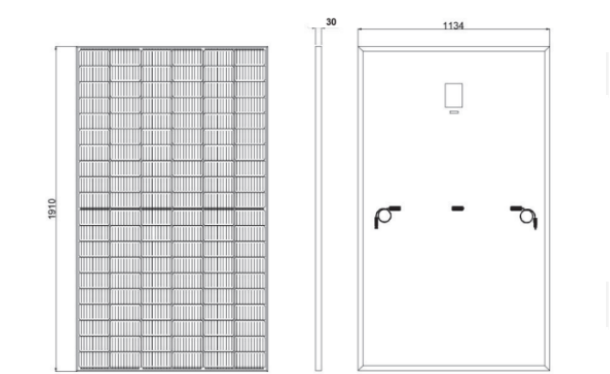
**ELECTRICAL CHARACTERISTICS**      STC: AM1.5 1.000W/m2    NOTC: AM1.5 800W/m2 20° 1 m/s    Test uncertainty for Pmax 0 - +3%

Module type	TOP - 470M-120AB		TOP - 475M-120AB		TOP - 480M-120AB		TOP - 485M-120AB		TOP - 490M-120AB	
	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Maximum Power (Pmax/w)	470	353	475	357	480	361	485	365	490	369
Open Circuit Voltage (Voc/V)	42.38	40.25	42.54	40.41	42.71	40.57	42.86	40.73	43.03	40.89
Short Circuit Current (Isc/A)	14,15	11,42	14,23	11,49	14,31	11,55	14,39	11,63	14,47	11,70
Voltage at Maximum Power (Vmp/V)	35.05	32.21	32.21	33.10	35.38	33.27	35.53	33.42	35.70	33.58
Current at maximum Power (Imp/A)	13,41	10,73	13,49	10,79	13,57	10,85	13,65	10,91	13,73	10,99
Module Efficiency (%)	21.78%		22.01%		22.24%		22.47%		22.70%	

**MECHANICAL PARAMETERS**

Cell Orientation	single crystal N-Topcon 182x91mm (120 pieces)
Junction Box	IP68, three diodes
Output Cable	1000mm (can be customized)
Glass	3.2mm high transparency, tempered glass
Frame	Anodized aluminum alloy frame
Weight	23.8 kg
Dimensión	1903*1134*30mm
Packaging	37 pcs*pallet / 888 pcs*40HC

**PHYSICAL CHARACTERISTICS**



**OPERATING PARAMETERS**

Operational Temperature	-40°C - +85°C
Power Output Tolerance	(0, +3%)
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	25 A
Nominal Operating Cell Temperature	45±2°C
Protection Glass	Class II
Fire Rating	Class C

**MECHANICAL LOADING**

Front Side Maximum Static Loading	5400 PA
Rear Side Maximum Static Loading	2400 PA

**TEMPERATURA RATINGS (STC)**

Temperature Coefficient of Isc	+0.046%/°C
Temperature Coefficient of Voc	-0.25%/°C
Temperature Coefficient of Pmax	-0.30%/°C

**PACKING MANNER**

Container	40ft(HQ)
Number of modules per container	888
Number of modules per pallet	37
Number of pallets per container	24

TAMESOL Authorized Solar Dealer

**Note:** The specifications are obtained under the Standard Test Conditions (STCs): 1000 W/m2 solar irradiance, 1.5 Air Mass, and cell temperature of 25°C. The NOCT is obtained under the Test Conditions: 800 W/m2, 20°C ambient temperature, 1m/s wind speed, AM 1.5 spectrum. Please contact [info@tamesol.com](mailto:info@tamesol.com) for technical support. The actual transactions will be subject to the contracts. This parameter is for reference only and it is not a part of the contracts. The specifications are subject to change without prior notice.