

## Features

- Breaking the 20 % Efficiency barrier  
Q.ANTUM Technology combined with zero gap cell layout boosts module efficiency up to 20.9 % absolute.
- Low Electricity generation costs  
Higher yield per surface area, lower BOS costs and up to 30 watts more power per module.
- Enduring High Performance  
Long-term yield security with Anti LID Technology, Anti PID Technology, Hot-Spot Protect and Traceable Quality Tra.Q™.
- Extreme weather Rating  
High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (2400 Pa).
- A Reliable Investment  
Inclusive 12-year product warranty and 25-year linear performance warranty.
- State of the art Module Technology  
Q.ANTUM DUO combines cutting edge cell separation and innovative 12-busbar design with Q.ANTUM Technology.

## Applications

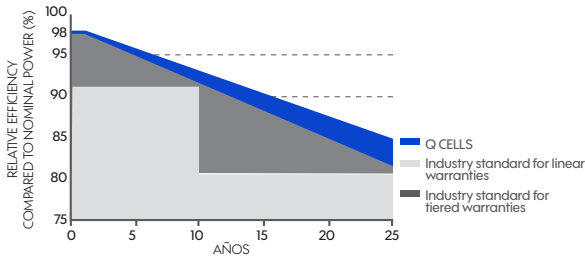
- Educational Centers
- Industry
- Pig farm
- Residence
- Restaurant
- Gymnasium





# Q CELLS 460 W Specs

## Q CELLS Performance Warranty



At least 98 % of nominal power during first year. Thereafter max. 0.54 % degradation per year. At least 93.1 % of nominal power up to 10 years. At least 85 % of nominal power up to 25 years.

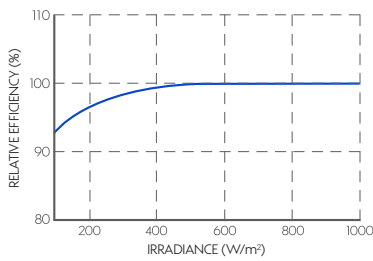
All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

\* Standard terms of guarantee for the 10 PV companies with the highest production capacity in 2014 (as at: September 2014)

## Packaging Information

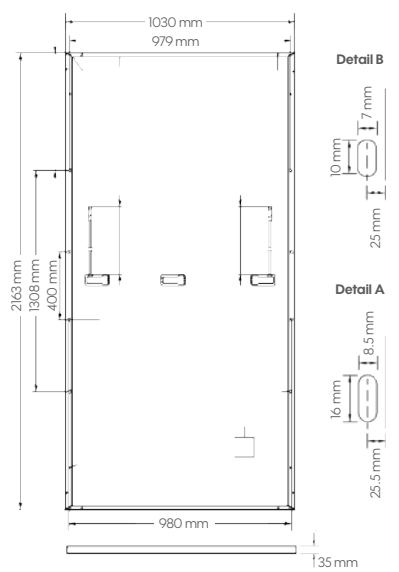
Number of Modules per Pallet	29
Number of Pallets per 40' HC-Container (26 t)	22
Pallet Dimensions (L × W × H) (mm)	2230 x 1080 x 1196
Pallet Weight (kg)	781

## Performance at low Irradiance



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m2).

## 460W Solar panel dimensions



Model		460 W Solar Panel
<b>Mechanical Specifications</b>		
Format	2163 mm × 1030 mm × 35 mm (including frame)	
Weight (kg)	25.5	
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology	
Back Cover	Composite film	
Frame	Anodised aluminium	
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells	
Junction box	53-101 mm × 32-60 mm × 15-18 mm, Protection class IP67, with bypass diodes	
Cable	4 mm² Solar cable; (+) ≥ 1450 mm, (-) ≥ 1450 mm	
Connector	Stäubli MC4-Evo2, Hanwha Q CELLS HQC4; IP68	
<b>Power Class</b>		
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STCI (POWER TOLERANCE +5 W / -0 W)		
Power at MPP <sup>1</sup>	P <sub>MPP</sub> (W)	460
Short Circuit Current <sup>1</sup>		10.70
Open Circuit Voltage <sup>1</sup>	V <sub>OC</sub> (V)	53.25
Current at MPP	I <sub>MPP</sub> (A)	10.25
Voltage at MPP	V <sub>MPP</sub> (V)	44.89
Efficiency <sup>1</sup>	η (%)	≥ 20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT <sup>2</sup>		
Power at MPP	P <sub>MPP</sub> (W)	344.5
Short Circuit Current		8.62
Open Circuit Voltage	V <sub>OC</sub> (V)	50.22
Current at MPP	I <sub>MPP</sub> (A)	8.08
Voltage at MPP	V <sub>MPP</sub> (V)	42.64
<b>Temperature Coefficients</b>		
Temperature Coefficient of I <sub>sc</sub>	α (%/K)	+ 0.04
Temperature Coefficient of P <sub>MPP</sub>	γ (%/K)	- 0.35
Temperature Coefficient of V <sub>OC</sub>	β (%/K)	- 0.27
Nominal Module Operating Temperature	NMOT (°C)	43 ± 3
<b>Propiedades para el diseño del sistema</b>		
Maximum System Voltage	V <sub>sys</sub> (V)	1500 (IEC) / 1500 (UL)
Maximum Reverse Current	(A DC)	20
Max. Design Load, Push / Pull	(lbs/ft²)	75 (3600 Pa) / 33 (1600 Pa)
Max. Test Load, Push / Pull	(lbs/ft²)	113 (5400 Pa) / 50 (2400 Pa)
PV module classification		II
Fire Rating based on ANSI / UL 1703		C / TIPO I
Permitted Module Temperature on continuous duty		-40 - +85 °C
<b>Qualifications and Certificates</b>		
Certificates	UL 61730, complies with CE, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215	

<sup>1</sup> Measurement tolerances PMPP ± 3 %; ISC; VOC ± 5 % at STC: 1000 W/m2, 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • 2 800 W/m², NMOT, spectrum AM 1.5  
The specifications are subject to changes and modifications without prior notice, due to our commitment of continuous improvement of reliability, design and functionality of our products