



midsummer **WAVE**

The world's first solar panel for roof tiles

Midsummer WAVE is a unique wave-shaped solar panel designed for two-barrel roof tiles, where the end product becomes a discreet solar roof. The solar panel is only 2 mm thin, consists of 20 thin-film solar cells, covers five roof tiles in width and fits Sweden's most popular roof tiles Palema from Benders, Jönåker from Monier and Mjögback and Ekeby from S: t Eriks.

Today, Midsummer WAVE is installed on both villas and apartment buildings throughout Sweden. During installation, the solar panels are placed on top of roof tiles and fastened under the row of tiles above, then the panels are connected in series row by row and the wiring is discreetly hidden under the roof tiles.

Thanks to the simple installation method, Midsummer WAVE can either be retrofitted to existing roof tiles or in the event of a complete roof replacement, without drilling holes in the roof sealing layer or damaging the roof tiles. This provides security for our customers and ensures that the facility lasts for a long time.



Minimalist and elegant Scandinavian design – Adapted for private homes as well as commercial and historic buildings, without changing the original architectural design.

Made in Sweden – We at Midsummer owns the entire value chain from production to installation and have the entire production in Järfälla outside Stockholm. This means low climate footprints and decent working conditions.

Safe and complete installation throughout Sweden – Midsummer guides their customers through the entire process and offers turnkey installations - ready to go.

Superior shading performance
The bypass technology between each cell ensures that shading on one or more solar cells only affects the current cells instead of the entire panel.

Minimum weight allows easy and safe installation without penetrating the waterproofing layer of the roof.

Flexible solar panels allow installation on curved surfaces and roofs. The panels can also be walked on during maintenance.

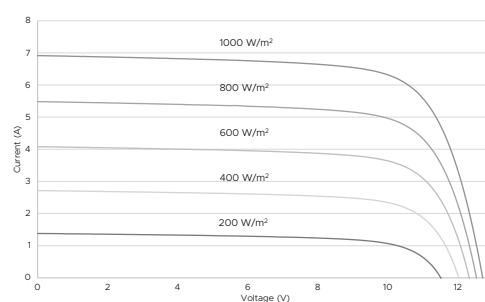
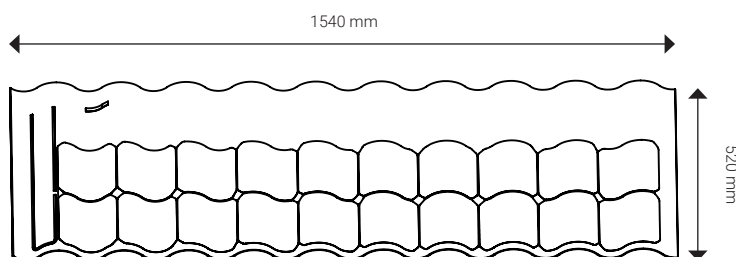
Highly efficient CIGS cells without toxic cadmium thanks to our unique Midsummer DUO system.



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Technical characteristics



ARTICLE INFORMATION

Number of cells (1 bypass diode between each cell)	20
Weight	2,3 kg/panel
Width	1 540 mm
Construction width	1 500 mm
Length	520 mm
Construction length	340-375 mm
Thickness	2 mm
Roof pitch	min 22°
Minimum bend radius	0,50 m
Cell type thin film	IGS (Cu (In, Ga) Se₂)
Product warranty	10 years
Linear power guarantee after 10 years	90 %
Linear power guarantee after 25 years	80 %
Certifications	(TÜV Rheinland certifierad) IEC 61730, IEC 61215
Color of the panel	Black

TECHNICAL DATA

Nominal Power, P _{MAX} *	55 W	60 W
Power/m ²	110 W	120 W
Power/kg	24 W	26 W
Maximum Power Voltage, V _{MPP}	9,8 V	10,3 V
Maximum Power Current, I _{MPP}	6,1 A	6,1 A
Open Circuit Voltage, V _{OC} *	12,4 V	12,6 V
Short Circuit Current, I _{SC} *	6,9 A	6,9 A
Maximum Series Fuse Rating	10 A	
Maximum System Voltage, V _{DC}	1000 V	
Protection class against electrical shock	II	
Design Load**	± 1600 Pa	
Module operating range	-40 to +85 °C	
Temperature coefficient, P _{MAX} (W), γ	-0,408 % / °C	
Temperature coefficient, V _{OC} (V), β	-0,328 % / °C	
Temperature coefficient, I _{SC} (A), α	0,0006 % / °C	

* Testing performed at STC (Standard test conditions): solar radiation of 1000 W/m² with perpendicular incidence towards the module surface, module temperature 25°C, Air mass 1.5 (AM 1.5 spectrum). The tolerance for the value is ±10%, positive-sorted modules +5W /- 0W .

**Test load ± 2400 Pa, Max altitude: 2000 m



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Consult Midsummer for a technical assessment of your roof.