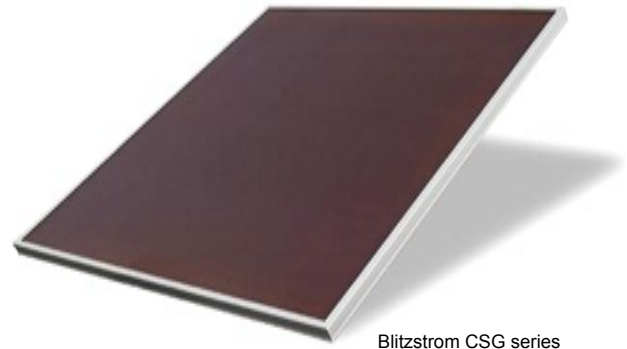


CSG (Crystalline Silicon on Glass) Technology

CSG solar modules are an innovation of manufacturer CSG Solar AG. This technology has been developed to market readiness in cooperation with international research institutions. The result is a crystalline silicon-based thin-film solar module, that is nearly unrivalled in robustness and long-term stability.

Features of CSG solar modules:

- + Proven poly-crystalline technology
- + Positive power tolerance
- + Aesthetically pleasing exterior
- + Low self-weight, easy installation
- + Suitable for transformerless inverters
- + Low resource consumption (silicon usage reduced to about 1/150th of the amount needed for conventional silicon technology)

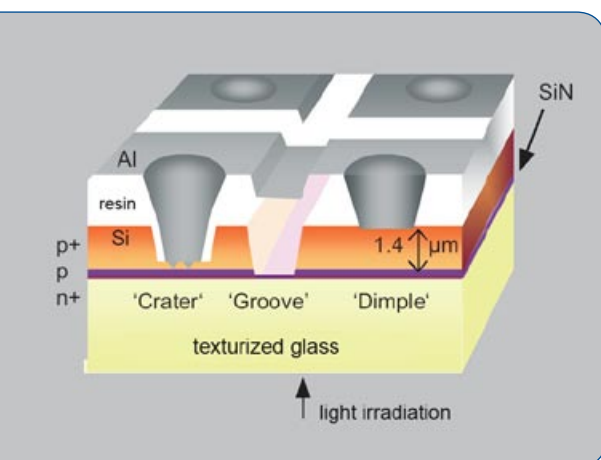


Blitzstrom CSG series

Durable - Almost no degradation is observed in CSG modules after exposure to the equivalent of over 30 years of UV radiation. Conventional wafer-based modules degrade by at least 5-10% after such exposure.

Resistant - CSG modules are highly resistant to water intrusion and other environmental factors. The only electrical materials used in the solar cells are environmentally stable silicon and aluminium.

Stable - CSG modules have demonstrated exceptional stability over the years. Their power output remains practically unchanged after many years of outdoor exposure, demonstrating the best long term stability in performance of any solar module on the market. CSG modules are warranted to retain at least 90% of their rated nominal power for 12 years and 80% of their rated power for 25 years.



Structural layout of a CSG solar module



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In Cooperation with





Automated manufacturing of CSG solar modules at CSG Solar's state-of-the-art production facility in Thalheim, Saxony-Anhalt (Germany).



Electrical Specifications

All Numbers obtained at STC: Immission 1000 W/m² with spectrum AM 1.5 at a cell temperature of 25 °C.

Blitzstrom		Tolerance	CSG-70	CSG-75	CSG-80	CSG-85	CSG-90
Nominal Power	P_{MPP}	-0% /+5%	70 Wp	75 Wp	80 Wp	85 Wp	90 Wp
Voltage at P_{MPP}	U_{MPP}	-5% /+5%	56 V	57 V	59 V	61 V	63 V
Current at P_{MPP}	I_{MPP}	-5% /+5%	1.32 A	1.34 A	1.37 A	1.41 A	1.45 A
Open Circuit Voltage	U_{OC}	-5% /+5%	78 V	79 V	80 V	81 V	82 V
Short Circuit Current	I_{SC}	-5% /+5%	1.56 A	1.57 A	1.59 A	1.62 A	1.65 A



Dimensions and Weight

Dimensions (Tolerance ±1.5mm)	1253 mm x 1103 mm = 1.38m ²
Frame height (Tolerance ±1.5mm)	41 mm
Mechanical Weight	14.5 kg



Key Features

Number of cells	175, monolithically linked
Cell type	Crystalline Silicon on Glass (CSG)
Front cover	Borosilicate glass (3.3mm)
Encapsulant	EVA (Ethylene Vinyl Acetate)
Backsheet	Tedlar-Polyester (TPE)
Frame	Silver anodized aluminium
Output terminals	Solar cables with MC [®] connectors (MC-4), IP65
Bypass diode	1



Temperature Coefficients

Temperature Coefficient of P_{MPP}	$T_K (P_n)$	-0.45% to -0.6% /°C *
Temperature Coefficient of U_{OC}	$T_K (U_{OC})$	- 390 mV / °C
Temperature Coefficient of I_{SC}	$T_K (I_{SC})$	+ 1.5 mA / °C
NOCT (Nominal Operating Cell Temperature)		41°C

(* according to technical progress)



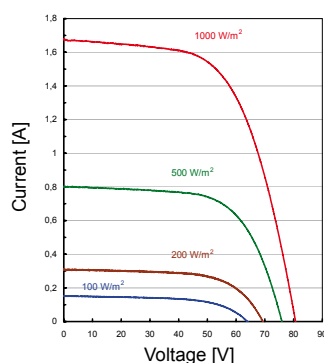
Operational Limits

Maximum system voltage	1000 V _{DC}
Operating temperature	-40°C to +90°C
Tested wind resistance	130 km/h
Hail resistance	25mm at 83 km/h



Certifications

The pv modules Blitzstrom CSG 70 to CSG 90 are manufactured by CSG Solar AG, Germany. IEC 61215, IEC 61646, IEC 61730 and TÜV Safety Class II certification will be issued in 2007.



The following characteristics show the output power for different light immission rates at a cell temperature of 25°C (for CSG-80).

