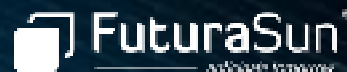


# Silk<sup>®</sup> Rhino All Black



n-type

TECHNOLOGY  
INSIDE

**450 W 22.52 %**

Maximum power

Maximum efficiency

## KEY BENEFITS AND FEATURES



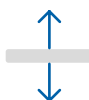
Power from **440 to 450 Watt**



96 G12R **n-type** half-cut cells



**High Hail resistance**, up to 50 mm  
hailstones diameter at 111 km/h



Increased **glass thickness**



Up to **7800 Pa snow load** resistance  
thanks to **two extra aluminum bars**



1762 x 1134 x 30 mm

### Performance guarantee

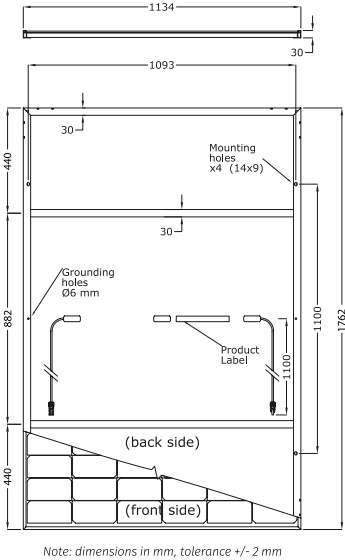
- **25-years** performance warranty with max power decrease from 2<sup>nd</sup> year **0.4%/year**
- **99%** at the end of first year
- **92%** at the end of 20<sup>th</sup> year
- **89%** at the end of 25<sup>th</sup> year

### Product guarantees

- **15-year** product warranty
- Third-party product **liability** insurance
- All FuturaSun's modules are designed and guaranteed by the **Italian** headquarters

Mechanical Specifications

Dimensions	1762 x 1134 x 30 mm
Weight	26.6 kg
Glass	High transmission, Low iron, Tempered, ARC, Thickness 4 mm
Cells	96 monocrystalline half-cut MBB n-type cells 182 x 105 mm
Frame	Black anodized aluminium frame with mounting and drainage holes
Junction boxes	Certified according to IEC 62790, IP 68 approved, 3 bypass diodes
Cables	Solar cable, length 1100 mm or customized assembled with 4mm² compatible connectors
Backsheet	Composite Multilayer film - black
Maximum reverse current (Ir)	25 A
Maximum system voltage	1000 V (1500 V on request)
Mechanical load (snow)	Design load: 7800 Pa, (11700 Pa including safety factor 1.5)
Mechanical load (wind)	Design load: 5400 Pa, (8100 Pa including safety factor 1.5)



Electrical data - STC\*

		FU 440 M	FU 445 M	FU 450 M
Sorting tolerance	W	0/+5		
Module power (Pmax)	W	440	445	450
Open circuit voltage (Voc)	V	35.14	35.30	35.47
Short circuit current (Isc)	A	15.85	15.91	15.97
Maximum power voltage (Vmpp)	V	29.62	29.81	30.01
Maximum power current (Impp)	A	14.86	14.93	15.00
Module efficiency	%	22.02	22.27	22.52

Electrical data - NOCT\*\*

		FU 440 M	FU 445 M	FU 450 M
Module power (Pmax)	W	331	334.60	338.40
Open circuit voltage (Voc)	V	33.40	33.56	33.72
Short circuit current (Isc)	A	12.80	12.84	12.90
Maximum power voltage (Vmpp)	V	27.58	27.75	27.89
Maximum power current (Impp)	A	12.00	12.06	12.12

Temperature ratings

Temperature coefficient Isc	%/°C	0.045
Temperature coefficient Voc	%/°C	-0.25
Temperature coefficient Pmax	%/°C	-0.29
NOCT**	°C	45 ± 2
Operating temperature	°C	from -40 to +85

Certifications

Factory	ISO 9001 - 14001 - 45001
Product	IEC EN 61730, IEC EN 61215, Fire Class C, HW5 hail resistance class

Packaging

Quantity / Pallet	36 pcs
Container 40' HC	936 pcs / 26 pallets

The information included in this module datasheet is subject to change without notice and is provided for informational purposes only. No contractual rights are established or should be inferred because of user's reliance on the information contained in this module datasheet. Please refer to the appropriate module user guide and module product specification document for more detailed technical information regarding module performance, installation and use.

\*Standard Test Conditions STC: 1000 W/m² - AM 1.5 - 25 °C - tolerance: Pmax (±3%), Voc (±4%), Isc (±5%)  
\*\*Nominal Operating Cell Temperature NOCT: 800 W/m² - T=45 °C - AM 1.5

EN\_01