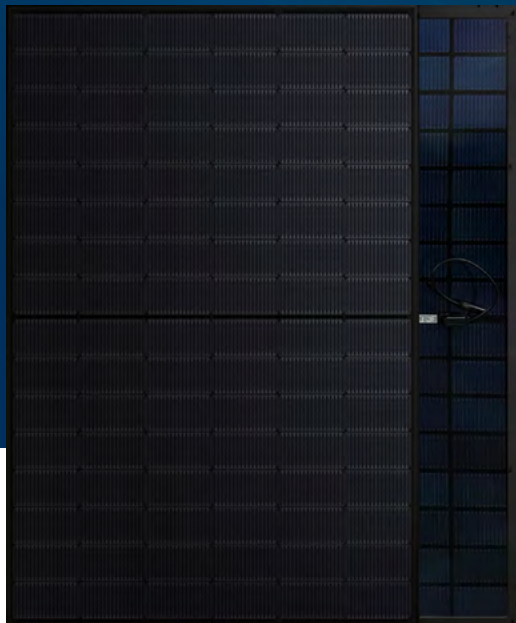


Silk[®] Nova Duetto All Black



n-type

TECHNOLOGY
INSIDE

450 W **22.52 %**

Maximum power

Maximum efficiency

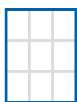
KEY BENEFITS AND FEATURES



Power from **440 to 450 Watt**



96 G12R MBB **n-type bifacial** cells



Black frame and
black-patterned back glass



for buildings with
high aesthetic value



Improved **long-life stability**



1762 x 1134 x 30 mm

Performance guarantee

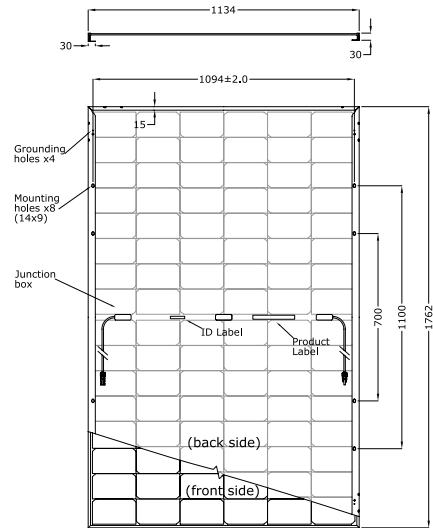
- **30-years** performance warranty with max power decrease from 1st year **0.4%/year**
- **99%** at the end of first year
- **92%** at the end of 20th year
- **87%** at the end of 30th year

Product guarantees

- **15-year** product and performance 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	25.5 kg
Glass	Front - 2.0 mm solar glass with ARC Back - 2.0 mm heat strengthened glass
Cells	96 monocrystalline half-cut MBB n-type bifacial 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
Back glass	black-patterned back-glass
Maximum reverse current (Ir)	35 A
Maximum system voltage	1500 V
Mechanical load (snow)	Design load: 3600 Pa, (5400 Pa including safety factor 1.5)
Mechanical load (wind)	Design load: 1600 Pa, (2400 Pa including safety factor 1.5)



Note: dimensions in mm, tolerance +/- 2 mm

Electrical data

Electrical data		FU 440 M		FU 445 M		FU 450 M	
TEST CONDITIONS		STC*	BNPI**	STC*	BNPI**	STC*	BNPI**
Module power (Pmax)	W	440	488	445	493	450	499
Open circuit voltage (Voc)	V	35.15	35.25	35.31	35.41	35.48	35.58
Short circuit current (Isc)	A	15.84	17.55	15.91	17.63	15.97	17.69
Maximum power voltage (Vmpp)	V	29.63	29.63	29.83	29.83	30.03	30.03
Maximum power current (Impp)	A	14.85	16.45	14.92	16.53	14.99	16.62
Module efficiency	%	22.02	24.40	22.27	24.67	22.52	24.97
Isc at BSI****	A	19.65		19.73		19.80	
Sorting tolerance	W	0/+5					

Electrical data - NOCT***

		FU 440 M	FU 445 M	FU 450 M
Module power (Pmax)	W	330.90	334.60	338.40
Open circuit voltage (Voc)	V	33.39	33.55	33.80
Short circuit current (Isc)	A	12.80	12.85	12.89
Maximum power voltage (Vmpp)	V	27.58	27.77	27.95
Maximum power current (Impp)	A	12.00	12.05	12.11

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 61215, IEC EN 61730, Fire Class C

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%)
**Bifacial Name Plate Irradiance (BNPI): Front side irradiation 1000 W/m² Back side reflection irradiation 135 W/m² Ambient temperature 25 °C
***Nominal Operating Cell Temperature (NOCT): 800 W/m² - T=45 °C - AM 1.5
****Bifacial Stress Irradiance (BSI): Front side irradiation 1000 W/m², Back side reflection irradiation 300 W/m²