



The Leader In Flexible, Powerful, Lightweight Thin-Film Solar

MiaSolé leads the paradigm shift from rigid solar panels and all their

MiaSolé is the producer of powerful, lightweight, shatterproof and flexible solar cells. The innovative solar cell is based on the highest efficiency thin-film technology available today, and its flexible cell architecture makes it ideal for a wide variety of solutions ranging from off-grid transportation solutions to commercial roofing solar panels to flexible mobile devices.

■ Why flexible solar?

Flexible lightweight shatterproof solar cells and modules can go where rigid breakable glass modules can't. This makes it possible to add solar energy generation to curved surfaces, vehicles, structures such as carports and storage facilities, floating reservoir covers, landfill membrane covers, low load capacity roofs, as well as mobile devices and many other applications.

■ Why MiaSolé?

MiaSolé's advanced CIGS technology has an aperture efficiency as high as 17%

■ How do we do it?

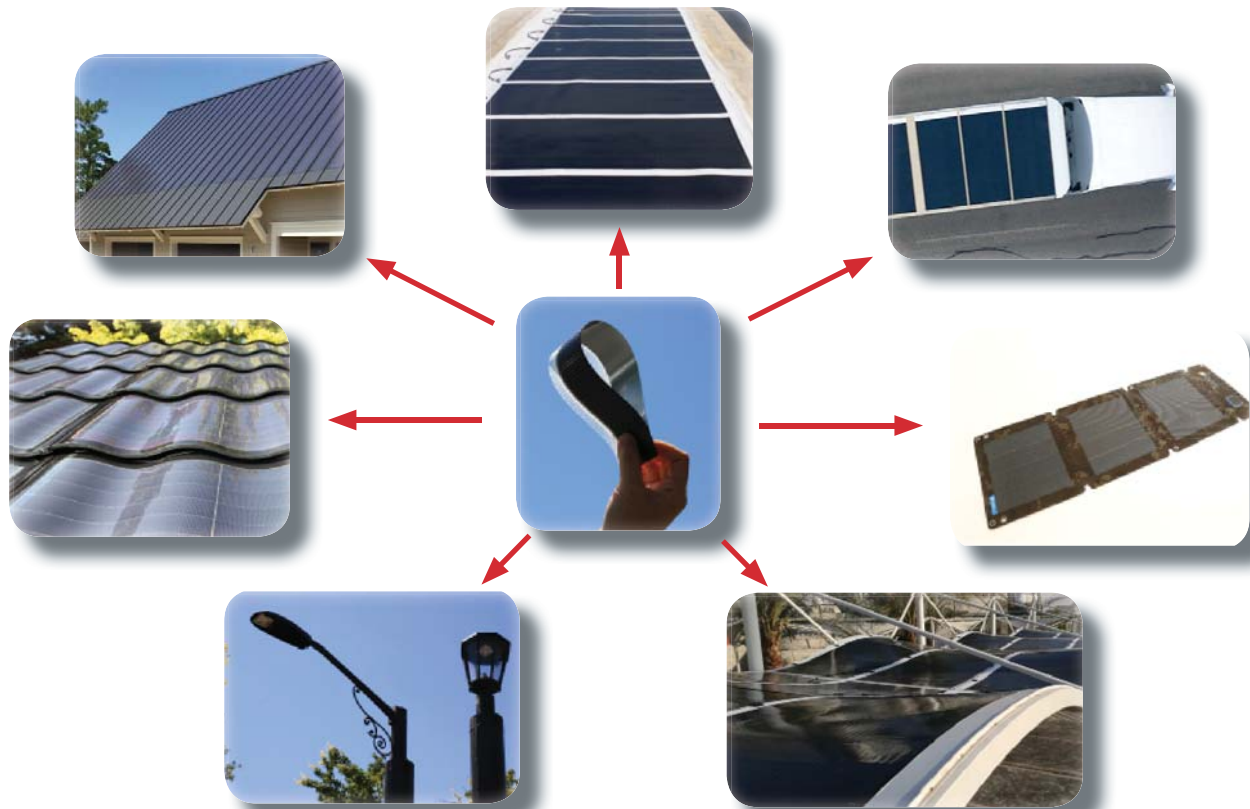
We begin with high-grade stainless steel foil and use an advanced semiconductor deposition process, PVD, to produce the most controlled, stable, and powerful flexible stainless steel CIGS cell in the world. Once the cell structure is deposited on the foil, special transparent conductive oxides are applied, and a specialized plastic-cell interconnect mesh-wire system is laminated to the cell, which is in turn protected by special water barrier plastics. The transparent water barrier is key to the longevity of MiaSolé FLEX modules. The special plastic back sheet has an internal aluminum film to prevent water transmission from eroding the powerful stainless steel CIGS cells.

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MiaSolé Flexible Solar Benefits

MiaSolé unique solar cells and modules are the key to the world's most powerful lightweight flexible thin-film CIGS solar modules. These modules are ideal for a wide variety of applications not suitable for fragile, heavy, rigid silicon modules.



- **Lightweight:** Less than 2.4 kg/m² (<0.5 lb/ft²). Because FLEX-02 modules are so much lighter than heavy rigid silicon panels mounted with racks, they are the best solution for building structures with low dead load and environmental load limitations (such as snow). The modules are also ideal for other structures, such as autos, trucks, and RVs, that are not constructed to support the weight of traditional solar panels.
- **Powerful:** MiaSolé FLEX modules are the highest efficiency flexible thin-film CIGS modules in production today, with aperture efficiencies as high as 17% today, providing over four times the power generation per kilogram of silicon. In the future, efficiencies of up to 20% are expected.
- **Easy to Install:** MiaSolé FLEX modules use peel-and-stick application. This eliminates penetrations into the structure, reducing the chance of leaks. Peel-and-stick application also allows for installation on surfaces such as autos, trucks, and RVs where racks would not be feasible, and lowers the balance-of-systems (BOS) costs and complexity when mounting FLEX modules on rooftops.
- **Flexible:** MiaSolé FLEX modules conform to curved surfaces, enabling solar power generation on surfaces not suited to traditional rigid silicon panels.
- **Resistant to Natural Disasters:** MiaSolé modules are thin (2.5mm) and adhere directly to surfaces, providing excellent wind and seismic resistance. The modules are also shatterproof, and won't break if struck by debris.
- **Reliable:** MiaSolé modules' unique redundant interconnect design enables industry-leading reliability.

SolarRide™ Transportation Solution

The SolarRide™ transportation solution is comprised of solar modules and a proprietary smart charge controller that ensures you receive the maximum benefit from your solar investment.

SolarRide auxiliary power allows you to:

- **Reduce Fuel Consumption.** Use solar energy instead of gas to power auxiliary systems
- **Reduce Maintenance Costs.** Running the truck engine less results in decreased intervals for scheduled maintenance.
- **Reduce Emissions.** Using clean solar power instead of fuel reduces emissions to help truckers comply with environmental regulations
- **Provide Stand-by Power.** Use solar energy for standby power without running the engine.
- **Provide Power to Truck De-icing Systems.** De-ice the truck with solar energy instead of fuel
- **Offload Alternator Loads.** Use solar power to provide offoad electrical power



The SolarRide smart charge controller optimizes solar power

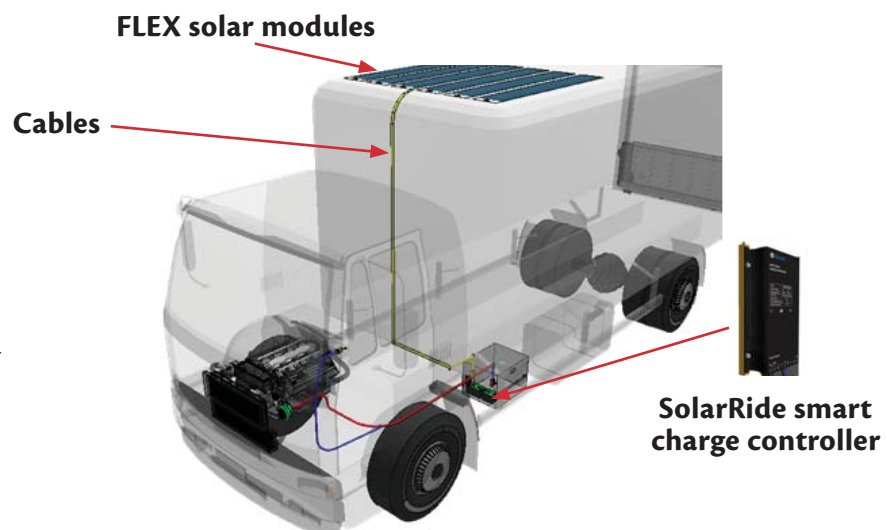
The MiaSolé smart charge controller ensures that all of the power generated by the solar modules is utilized and provides overcharge and undercharge protection.

Key features:

- When the truck engine is on, the charge controller prioritizes solar power over alternator power
- When the engine is off, solar power charges the vehicle battery(s)
- SolarRide smart charge controller reliably manages power delivery from multiple sources

Components:

- FLEX solar modules
- SolarRide smart charge controller
- Cables



Off-Grid Solutions

Many solar applications are considered "off-grid" when the power they generate is self-contained. Following are examples of off-grid applications where MiaSolé FLEX modules provide unique benefits:

Consumer Applications

- Flexible panels work with many types of devices and formats
- Lightweight panels keep overall weight of the device low
- Shatterproof modules are durable
- Dark color is aesthetically appealing
- Most powerful flexible panel on the market today



Off-grid Lighting

- Flexible modules curve around light and charging pole structures for an unobtrusive look
- Modules can withstand 150+ mph winds and are shatterproof, creating a low risk of theft and vandalism
- Generates four times the wattage per kilogram compared to silicon panels
- Powerful enough to charge the battery to power the light for multiple days



photos courtesy of ClearWorld

FLEX Modules for Carports

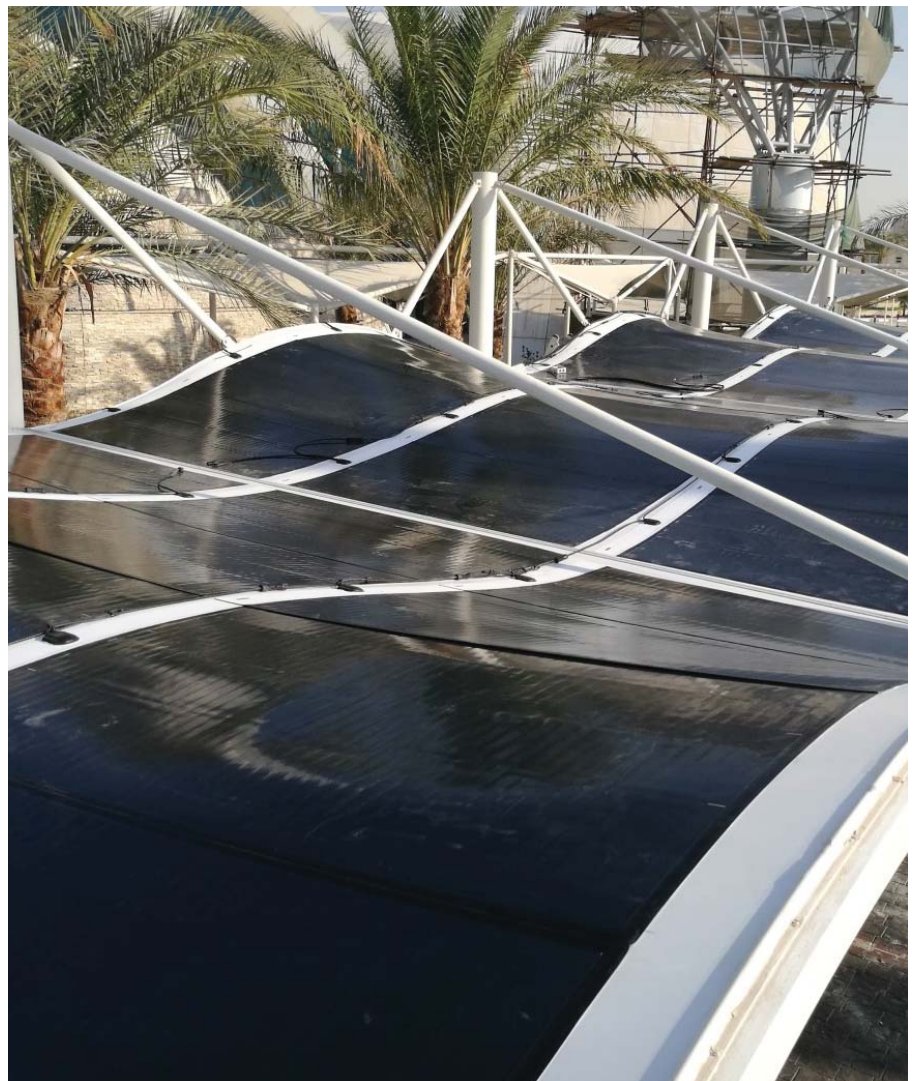
The MiaSolé FLEX-02W Series—the world’s most powerful lightweight and flexible thin-film solar module—is a perfect fit for new and existing carports.

Solar Carport Benefits:

- Provide highly desirable shade for parked cars, delivering increased owner comfort and a lower carbon footprint when the car is started and cooled
- Sun, rain, snow and hail protection
- Reduced parking lot temperatures and a lower heat-island effect
- Large power-generation area when compared to traditional roofs
- Fewer engineering and inspection challenges than traditional rooftop solar installations
- Fewer shading issues than traditional roofs

MiaSolé FLEX for Carport Benefits:

- Lightweight: less than 2.4 kg/m² (<0.5 lb/ft²)—Ideal for today’s cost-optimized carport structures
- Easy to install—simply peel-and-stick
- Bonds directly to 7.2-inch corrugated metal panels and standing-seam metal roofing
- Ideal for retrofitting solar onto existing carports
- Resistant to wind and seismic events; won’t detach or shatter if struck by debris
- Blends into the carport—minimal protrusion above the carport structure
- Theft and vandalism resistant
- Conforms to curved carport surfaces
- Low weight—four times the wattage per kilogram than silicon
- No rails or custom purlins
- No module grounding
- Non-penetrating
- Building-integrated PV module
- Designed for high wind and seismic zones



Solar Engineered for Today's Membrane Roof Systems

MiaSolé FLEX-0W Series – the world's most powerful flexible thin-film solar modules.

High Performance Solar Roofing in a Lightweight Format

The FLEX-02W Series modules are designed for low-slope commercial roofs. The FLEX modules bond directly onto the membrane roof system, eliminating the need for solar racking, concrete ballasts, and roof penetrations. Integration of the low-profile, thin-film modules onto the membrane roof surface protects against seismic movement and high winds. MiaSolé FLEX modules simplify project logistics and reduce labor costs and installation times. The final installed solar solution is lightweight, making it ideal for low weight bearing building structures.

Features and Benefits

- Factory-applied self-adhesive—simple peel-and-stick application
- Aperture efficiency rating of up to 17%
- Lightweight—2.4 kg/m² (0.5 lb/ft²)
- High wind zone performance
- Low labor and balance-of-system (BOS) Costs
- Direct bonding on TPO with some roof manufactures
- Optional: Secondary membrane panel option for older TPO roofs
- Provides four times the wattage per kilogram than silicon panels
- No ballast or racking/No rails or custom purlins
- No module grounding
- Non-penetrating
- Building-integrated PV module
- Designed for high wind & seismic zones



Layout Modules



Clean & Prep TPO



Peel & Stick Modules to TPO

The 3M FLEX module installation in Columbia, Missouri did not require expensive retrofitting—due to the lightweight FLEX modules the building could continue to support the annual snow load in addition to the solar system. The directly adhered modules provide excellent wind resistance and caused no increased risk of roof leakage and damage to valuable equipment in the building. According to Bill Moore, 3M Columbia plant manager, “MiaSolé has been a great partner in helping us establish a solar energy footprint. Their expertise helped us determine how to install a solar array on an older roof section and identify a qualified installer. The installation performs well and creates electricity each day that is essentially maintenance free.” Since the system was installed in December 2013, there have been no reports of problems due to wind damage or roof leakage, and performance is better than expected.

Metal Roofing Systems with High Efficiency Thin Film Solar

MiaSolé FLEX-N series modules are ideal for metal roofs, integration seamlessly between the standing seams for an unobtrusive look.

BlueScope, the leading manufacturer of steel roofing products for the Australian market, installed the first prototype of its Building Integrated PV Thermal (BIPV-T) hybrid roofing system in 2014. This new technology integrates new COLORBOND® Steel roofing with MiaSolé FLEX modules and draws air through the two skins of the roof through a plenum to provide warm or cool fresh air for the home. In BlueScope's BIPV-T design, a patented profile of the metal roof forms both the air plenum and a flat surface for the installation of photovoltaic (PV) modules. The solar modules generate electricity, while the air inside the channels is warmed by the sun, then drawn into the building for heating in the winter months. During clear summer evenings, the steel roof cools below ambient temperature and the air is then drawn into the building for night-time cooling. This roof is billed by ARENA chief executive Ivor Frischknecht as "an exciting new renewable energy solution that combines steel roofing with cutting-edge thin-film solar modules."

High Performance of Thin-film Solar in a Lightweight and Flexible Form Factor

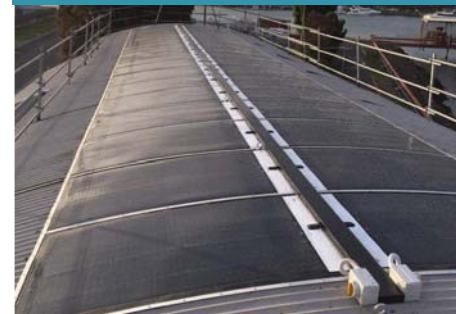
The FLEX Series product is the ideal solar solution for metal roofs. These panels are lightweight and can be directly bonded to the roof—eliminating racking, reducing weight load, and significantly lowering labor and project costs. FLEX modules can be installed over a wide range of standard architectural and specific exposed fastener metal roof panels. For example, the FLEX Series modules can be directly applied to industry-standard 7.2 trapezoid rib corrugated panels to create solar parking and RV canopies.

Features and Benefits

- Factory-applied self-adhesive—simple peel-and-stick application
- Aperture efficiency rating of up to 17%
- Lightweight—2.9 kg/m² (0.6 lb/ft²)
- High wind zone performance
- Lowest solar rooftop installation cost
- Integrated profile for aesthetic appeal
- Low installation cost
- Provides four times the wattage per kilogram than silicon panels
- Superior resistance to wind



Steep-slope Standing Seam



Low-slope Corrugated



Solar Parking Canopies

Geomembrane Covers for Water Reservoirs and Landfills

Placing solar modules on water reservoir and landfill covers is an ideal way to boost power generation capability.

Water Reservoir and Landfill Cover Benefits:

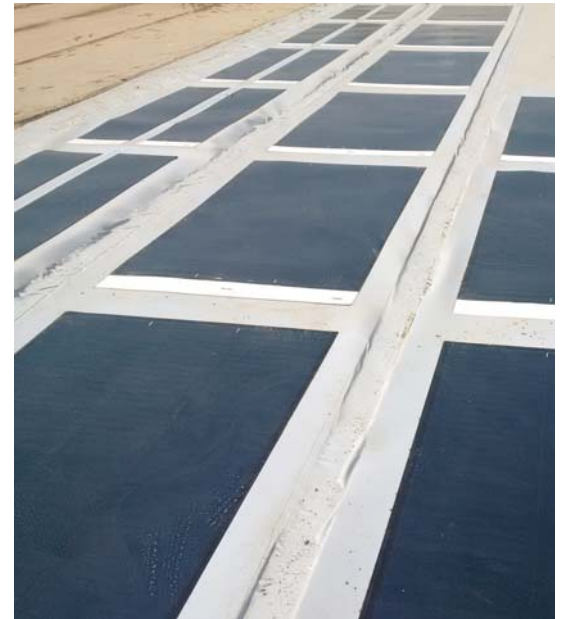
- Both are located on large, open areas with no commercial or agriculture use or value—perfect for solar installations.
- Large power-generation area and fewer shading issues when compared to rooftop solar.
- Excellent complement to landfill gas technology and hydro-based power generation to increase overall energy output.

For Reservoirs:

- Reduced evaporation due to the solar covering—a three-acre storage pond covered with solar panels could save over four million gallons of water each year.
- Less water contamination and algae growth, minimizing water treatment and associated labor costs.
- Modules are naturally cooled by the water for better performance.

For landfills:

- Closing and sealing landfills with a synthetic TPO membrane cover reduces costs compared to conventional standard subtitle D methods. Flexible modules can be bonded directly to the membrane cover.
- Membrane covers and flexible modules are a perfect combination for sloped landfill sites where conventional solar arrays cannot be installed due to slope and live-load limitations.



MiaSolé FLEX offers these benefits when used on geomembrane covers:

- Easy to install—simply peel-and-stick module onto the membrane used to cover the reservoir or landfill
- Non-penetration installation means no increased risk of leakage, protecting the environment
- Flexible—conforms to the contours of the landfill and accommodates differential settlement
- Lightweight: less than 2.4 kg/m² (<0.5 lb/ft²)—Ideal for floating structures
- Provides four times the wattage per kilogram than silicon
- Resistant to theft and vandalism
- Wind- and seismic-resistant
- Shatter-proof—won't break if struck by debris



photos of Dynactiv Power developed by Benecke-Kaliko

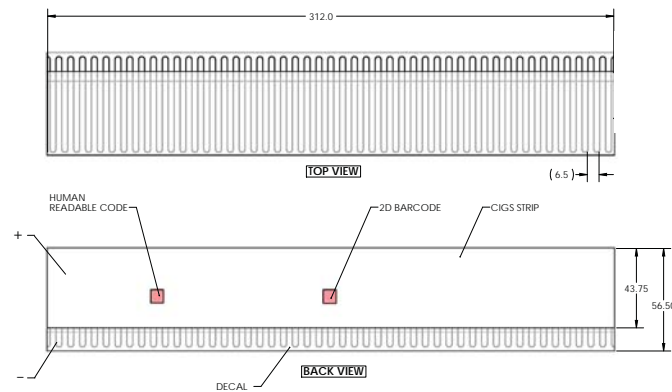
CIGS Solar Cell

MiaSolé thin-film CIGS solar cells on stainless steel substrate have high efficiency levels and provide significant advantages over conventional, rigid solar cells.

KEY FEATURES

- Cell efficiency level of up to 17% in a flexible form factor.
- Thin—0.33mm
- Lightweight—7.5 gm
- Ideal for many specialized uses. Versatile cell architecture means the size can be modified to suit various applications.
- Bendable and shatterproof

CELL DIAGRAM



ELECTRICAL PERFORMANCE BY .5% EFFICIENCY BINS

Cell Efficiency			15.5%	16.0%	16.5%	17.0%
Nominal Power	P_{MPP}	[W]	2.12	2.18	2.25	2.32
Power Output Tolerance		[W]	+0.1/-0	+0.1/-0	+0.1/-0	+0.1/-0
Maximum Power Voltage	V_{MPP}	[V]	0.526	0.531	0.538	0.545
Maximum Power Current		I_{MPP}	[A]	4.04	4.11	4.17
Open Circuit Voltage	V_{OC}	[V]	0.661	0.664	0.670	0.673
Short Circuit Current		I_{SC}	[A]	4.70	4.70	4.70

THERMAL CHARACTERISTICS*

NOCT	[°C]	48
Temperature Coefficient of P_{MPP}	[%/°C]	-0.38
Temperature Coefficient of V_{OC}	[%/°C]	-0.28
Temperature Coefficient of I_{SC}	[%/°C]	0.008

* based on MiaSolé FLEX-02 module measurements

PHYSICAL AND MECHANICAL SPECIFICATIONS

Length	312 mm +2/-4 mm
Width	43.75 mm ± .05 mm
Thickness	.33 mm ± .1 mm
Weight	7.5 gm ± 0.1 gm
Cell Type	Copper Indium Gallium Diselenide (CIGS)



FLEX-02 Series Modules

KEY FEATURES

- Record efficiency levels in a flexible form factor
- Low installed weight at less than 2.4 kg/m² (<0.5lb/ft²)
- No penetrations, ballast or racking required
- Applicable for high wind load and high seismic hazard areas
- Bypass diodes reduce PV system shading losses
- Directly bonds to many approved surfaces

RELIABILITY AND SAFETY

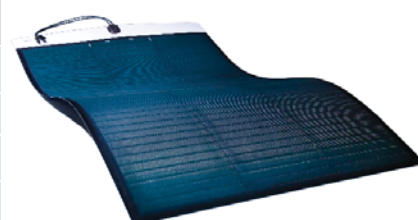
- IEC 61646, IEC 61730, IEC 62716, Australia CEC
- UL 1703, cUL 1703
- UL Class A over TPO – slope up to 2.5"

WARRANTY

- 5-year workmanship
- 10/25 year warranty against power loss

FLEX-02W and FLEX-02WS Specifications

	FLEX-02W Series	FLEX-02WS Series
Length	2597±7 mm (102.2±.3 in)	1722±7 mm (67.8±.3in)
Width	993±13 mm (39.1±.5 in)	
Module Thickness	2.5 mm (0.1 in)	
Weight	5.1 kg (11.1 lb) without adhesive 6.2 kg (13.7 lbs) with adhesive	3.4kg (7.5lb) without adhesive 4.2kg (9.2lb) with adhesive
Weight/Area	2.4 kg/m ² (0.5 lb/ft ²) with adhesive	
Junction Box Type	IP68	
Cable Connections	MC4 Compatible	
Cell Type	Copper Indium Gallium Selenide (CIGS)	
Bend Radius	508 mm (20 in) minimum	
Warranty*	5 year workmanship; 10/25 year power output	
Certifications	UL 1703, ULC ORD C1703, UL 2703, UL Class A over TPO - slope up to 2.5" IEC 61646, IEC 61730-1 & -2, IEC 61701, IEC 62716, Australia CEC, DEWA	



FLEX-02W



FLEX-02N

FLEX-02NS, FLEX-02N and FLEX-02NL Specifications

	FLEX-02NS Series	FLEX-02N Series	FLEX-02NL Series
Length	1722±7 mm (67.8±.3in)	2597±7 mm (102.2±.3 in)	5922±7 mm (233.1±.3 in)
Width	363±13 mm (14.3±.5in)	363±13 mm (14.3±.5 in)	363±13 mm (14.29±.5 in)
Module Thickness	2.5 mm (0.1 in)	2.5 mm (0.1 in)	2.5 mm (0.1 in)
Weight with adhesive	1.9kg (4.1lb)	2.7 kg (5.9 lb)	6.4 kg (14.1 lb)
Weight/Area	2.9 kg/m ² (0.6 lb/ft ²) with adhesive		
Junction Box Type	IP68		
Cable Connections	MC4 Compatible		
Cell Type	Copper Indium Gallium Diselenide (CIGS)		
Warranty*	5 year workmanship, 10/25 year power output		
Certifications	UL 1703, ULC ORD C1703, UL 2703, UL Class A over TPO - slope up to 2.5" IEC 61646, IEC 61730-1 & -2, IEC 61701, IEC 62716, Australia CEC, DEWA		

ELECTRICAL PERFORMANCE AT STC¹

FLEX-02WS SERIES CIGS MODULE

1722±7 mm (67.8±.3in) X 993±13 mm (39.1±.5 in)			FLEX-02 210WS	FLEX-02 220WS	FLEX-02 230WS	FLEX-02 240WS	FLEX-02 250WS
Nominal Power	P _{MPP}	[W]	210	220	230	240	250
Aperture Efficiency	η	[%]	14.2%	14.9%	15.6%	16.3%	17.0%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V _{MPP}	[V]	18.4	18.9	19.5	20.0	20.6
Maximum Power Current	I _{MPP}	[A]	11.43	11.63	11.81	11.98	12.16
Open Circuit Voltage	V _{OC}	[V]	23.8	24.2	24.5	24.9	25.3
Short Circuit Current	I _{SC}	[A]	13.53	13.55	13.56	13.57	13.58
Maximum Series Fuse Rating		[A]	25				
Maximum System Voltage	(IEC/UL)	[V]	1000/600				

FLEX-02W SERIES CIGS MODULE

2597±7 mm (102.2±.3 in) x 993±13 mm (39.1±.5 in)			FLEX-02 340W	FLEX-02 350W	FLEX-02 360W	FLEX-02 370W	FLEX-02 380W
Nominal Power	P _{MPP}	[W]	340	350	360	370	380
Aperture Efficiency	η	[%]	14.8%	15.3%	15.7%	16.1%	16.6%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V _{MPP}	[V]	29.3	29.9	30.4	31.0	31.5
Maximum Power Current	I _{MPP}	[A]	11.61	11.72	11.83	11.94	12.06
Open Circuit Voltage	V _{OC}	[V]	37.5	37.9	38.3	38.6	39.0
Short Circuit Current	I _{SC}	[A]	13.54	13.55	13.56	13.57	13.58
Maximum Series Fuse Rating		[A]	25				
Maximum System Voltage	(IEC/UL)	[V]	1000/600				

FLEX-02NS SERIES CIGS MODULE

1722±7 mm (67.8±.3in) x 363±13 mm (14.3±.5in)			FLEX-02 65NS	FLEX-02 70NS	FLEX-02 75NS	FLEX-02 80NS	FLEX-02 85NS
Nominal Power	P _{MPP}	[W]	65	70	75	80	85
Aperture Efficiency	η	[%]	13.2%	14.2%	15.3%	16.3%	17.3%
Power Output Tolerance		[W]	+5/-0	+5/-0	+5/-0	+5/-0	+5/-0
Maximum Power Voltage	V _{MPP}	[V]	17.7	18.5	19.3	20	20.8
Maximum Power Current	I _{MPP}	[A]	3.67	3.79	3.89	3.99	4.09
Open Circuit Voltage	V _{OC}	[V]	23.2	23.7	24.3	24.8	25.3
Short Circuit Current	I _{SC}	[A]	4.47	4.49	4.52	4.55	4.58
Maximum Series Fuse Rating		[A]	10				
Maximum System Voltage	(IEC/UL)	[V]	1000/600				

FLEX-02N SERIES CIGS MODULE

2597±7 mm (102.2±.3 in) x 363±13 mm (14.3±.5in)			FLEX-02 110N	FLEX-02 115N	FLEX-02 120N	FLEX-02 125N	FLEX-02 130N
Nominal Power	P _{MPP}	[W]	110	115	120	125	130
Aperture Efficiency	η	[%]	14.4%	15.0%	15.7%	16.4%	17.0%
Power Output Tolerance		[W]	+5/-0	+5/-0	+5/-0	+5/-0	+5/-0
Maximum Power Voltage	V _{MPP}	[V]	28.9	29.7	30.5	31.3	32.0
Maximum Power Current	I _{MPP}	[A]	3.81	3.87	3.93	4.00	4.06
Open Circuit Voltage	V _{OC}	[V]	37.1	37.6	38.1	38.6	39.1
Short Circuit Current	I _{SC}	[A]	4.5	4.52	4.53	4.55	4.57
Maximum Series Fuse Rating		[A]	10				
Maximum System Voltage	(IEC/UL)	[V]	1000/600				

FLEX-02NL SERIES CIGS MODULE

5922±7 mm (233.1±.3 in) x 363±13 mm (14.3±.5in)			FLEX-02 265NL	FLEX-02 275NL	FLEX-02 285NL	FLEX-02 295NL	FLEX-02 305NL
Nominal Power	P _{MPP}	[W]	265	275	285	295	305
Nominal Efficiency	η	[%]	14.7%	15.3%	15.8%	16.4%	16.9%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V _{MPP}	[V]	69.0	70.7	72.3	73.8	75.3
Maximum Power Current	I _{MPP}	[A]	3.84	3.89	3.94	4.00	4.05
Open Circuit Voltage	V _{OC}	[V]	87.9	89.0	90.0	91.0	92.1
Short Circuit Current	I _{SC}	[A]	4.51	4.52	4.54	4.55	4.57
Maximum Series Fuse Rating		[A]	10				
Maximum System Voltage	(IEC/UL)	[V]	1000/600				

¹Standard Test Conditions (STC): 1000 W/m², 25°C cell temperature, AM 1.5 spectrum

FLEX-03N & M Series Modules

KEY FEATURES

- Record efficiency levels in a flexible form factor
- Low installed weight at less than 2.4 kg/m² (<0.5lb/ft²)
- No penetrations, ballast or racking required
- Applicable for high wind load and high seismic hazard areas
- Bypass diodes reduce PV system shading losses
- Directly bonds to many approved surfaces

RELIABILITY AND SAFETY

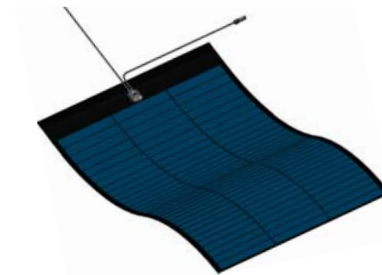
- IEC 61646, IEC 61730, IEC 62716, Australia CEC
- UL 1703, cUL 1703
- UL Class A over TPO – slope up to 2.5"

WARRANTY

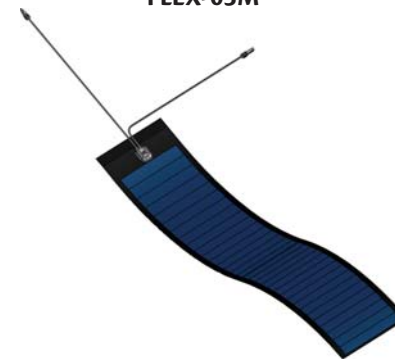
- 5-year workmanship
- 10/25 year warranty against power loss

FLEX-03M Specifications

	FLEX-03M
Length	2580 mm (101.6 in)
Width	1000 mm (39.4 in)
Module Thickness	17 mm (0.7 in), 2.5 mm (0.1 in)
Weight	5.1 kg (11.1 lb) without adhesive 6.2 kg (13.7 lb) with adhesive
Weight/Area	1.7 kg/m ² (0.3 lb/ft ²) w/out adhesive, 2.0 kg/m ² (0.4 lb/ft ²) with adhesive
Junction Box Type	IP68
Cable Connections	Amphenol Technology Shenzhen = (E346053)
Cell Type	Copper Indium Gallium Selenide (CIGS)
Warranty*	5 year workmanship; 10/25 year power output
Certifications	UL 1703, IEC 61646, IEC 61730, cUL 1703, IEC 62716, Australia CEC



FLEX-03M



FLEX-03N

FLEX-03NS, FLEX-03N and FLEX-03NL Specifications

	FLEX-03NS Series	FLEX-03N Series	FLEX-03NL Series
Length	1710 mm (67.3 in)	2585 mm (101.8 in)	5910 mm (232.7 in)
Width	348 mm (13.7 in)	348 mm (13.7 in)	348 mm (13.7 in)
Module Thickness	2.5 mm (0.1 in)	2.5 mm (0.1 in)	2.5 mm (0.1 in)
Weight	1.1 kg (2.4 lb) without adhesive 1.3 kg (2.9 lb) with adhesive	1.6 kg (3.6 lb) without adhesive 1.9 kg (4.3 lb) with adhesive	3.6 kg (7.9 lb) without adhesive 4.3 kg (9.5 lb) with adhesive
Weight/Area	1.8 kg/m ² (0.4 lb/ft ²) without adhesive, 2.2 kg/m ² (0.5 lb/ft ²) with adhesive		
Junction Box Type	IP68		
Cable Connections	MC4 Compatible		
Cell Type	Copper Indium Gallium Diselenide (CIGS)		
Warranty*	5 year workmanship, 10/25 year power output		
Certifications	UL 1703, IEC 61646, IEC 61730, cUL 1703, IEC 62716, Australia CEC		

*Please see full warranty for details.

ELECTRICAL PERFORMANCE AT STC¹

FLEX-03M SERIES CIGS MODULE

2580 mm (101.6 in) x 1000 mm (39.4 in)			FLEX-03 350M	FLEX-03 360M	FLEX-03 370M	FLEX-03 380M	FLEX-03 390M
Nominal Power	P_{MPP}	[W]	350	360	370	380	390
Aperture Efficiency	η	[%]	15.3%	15.7%	16.1%	16.6%	17.0%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V_{MPP}	[V]	29.2	29.5	29.9	30.2	30.5
Maximum Power Current	I_{MPP}	[A]	12.00	12.20	12.39	12.59	12.78
Open Circuit Voltage	V_{OC}	[V]	36.9	37.1	37.3	37.5	37.7
Short Circuit Current	I_{SC}	[A]	14.10	14.10	14.10	14.10	14.10
Maximum Series Fuse Rating		[A]	25				
Maximum System Voltage	(IEC/UL)	[V]	1000/1000				

FLEX-03NS SERIES CIGS MODULE

1710 mm (67.3 in) x 348 mm (13.7 in)			FLEX-03 70NS	FLEX-03 75NS	FLEX-03 80NS	FLEX-03 85NS
Nominal Power	P_{MPP}	[W]	70	75	80	85
Aperture Efficiency	η	[%]	14.3%	15.3%	16.3%	17.3%
Power Output Tolerance		[W]	+5/-0	+5/-0	+5/-0	+5/-0
Maximum Power Voltage	V_{MPP}	[V]	18.3	18.8	19.3	19.8
Maximum Power Current	I_{MPP}	[A]	3.85	4.00	4.15	4.30
Open Circuit Voltage	V_{OC}	[V]	23.5	23.7	24.0	24.3
Short Circuit Current	I_{SC}	[A]	4.70	4.70	4.70	4.70
Maximum Series Fuse Rating		[A]	10			
Maximum System Voltage	(IEC/UL)	[V]	1000/1000			

FLEX-03N SERIES CIGS MODULE

2585 mm (101.8 in) x 348 mm (13.7 in)			FLEX-03 110N	FLEX-03 115N	FLEX-03 120N	FLEX-03 125N	FLEX-03 130N
Nominal Power	P_{MPP}	[W]	110	115	120	125	130
Aperture Efficiency	η	[%]	14.4%	15.0%	15.7%	16.4%	17.0%
Power Output Tolerance		[W]	+5/-0	+5/-0	+5/-0	+5/-0	+5/-0
Maximum Power Voltage	V_{MPP}	[V]	28.5	29.0	29.5	30.0	30.5
Maximum Power Current	I_{MPP}	[A]	3.81	3.87	3.93	4.00	4.06
Open Circuit Voltage	V_{OC}	[V]	36.5	36.8	37.1	37.4	37.7
Short Circuit Current	I_{SC}	[A]	4.70	4.70	4.70	4.70	4.70
Maximum Series Fuse Rating		[A]	10				
Maximum System Voltage	(IEC/UL)	[V]	1000/1000				

FLEX-03NL SERIES CIGS MODULE

5910 mm (232.7 in) x 348 mm (13.7 in)			FLEX-03 270NL	FLEX-03 280NL	FLEX-03 290NL	FLEX-03 300NL	FLEX-03 310NL
Nominal Power	P_{MPP}	[W]	270	280	290	300	310
Nominal Efficiency	η	[%]	15.0%	15.5%	16.1%	16.7%	17.2%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V_{MPP}	[V]	68.3	69.3	70.3	71.3	72.3
Maximum Power Current	I_{MPP}	[A]	3.96	4.04	4.13	4.21	4.29
Open Circuit Voltage	V_{OC}	[V]	86.8	87.3	87.9	88.4	89.0
Short Circuit Current	I_{SC}	[A]	4.70	4.70	4.70	4.70	4.70
Maximum Series Fuse Rating		[A]	10				
Maximum System Voltage	IEC/UL	[V]	1000/1000				

¹Standard Test Conditions (STC): 1000 W/m², 25°C cell temperature, AM 1.5 spectrum

FLEX-03W Series Modules

KEY FEATURES

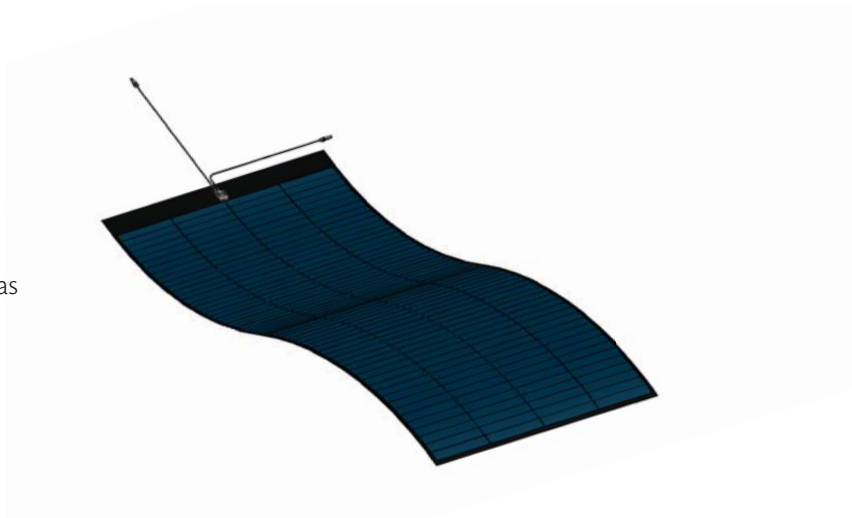
- Record efficiency levels in a flexible form factor
- Low installed weight at less than 2.4 kg/m² (<0.5lb/ft²)
- No penetrations, ballast or racking required
- Applicable for high wind load and high seismic hazard areas
- Bypass diodes reduce PV system shading losses
- Directly bonds to many approved surfaces

RELIABILITY AND SAFETY

- IEC 61646, IEC 61730, IEC 62716, Australia CEC
- UL 1703, cUL 1703
- UL Class A over TPO – slope up to 2.5"

WARRANTY

- 5-year workmanship
- 10/25 year warranty against power loss



FLEX-03W

FLEX-03W and FLEX-03WS Specifications

	FLEX-03W Series	FLEX-03WS Series
Length	2585 mm (101.8 in)	1010 mm (39.8 in)
Width	1293 mm (50.9 in)	1293 mm (50.9 in)
Module Thickness	17 mm (0.7 in), 2.5 mm (0.1 in)	17 mm (0.7 in), 2.5 mm (0.1 in)
Weight	5.5 kg (12.2 lb) without adhesive 6.6 kg (14.6 lb) with adhesive	2.1 kg (4.7 lb) without adhesive 2.5 kg (5.6 lb) with adhesive
Weight/Area	1.7 kg/m ² (0.3 lb/ft ²) w/out adhesive, 2.0 kg/m ² (0.4 lb/ft ²) with adhesive	
Junction Box Type	IP68	
Cable Connections	Amphenol Technology Shenzhen (E346053)	
Cell Type	Copper Indium Gallium Selenide (CIGS)	
Warranty*	5 year workmanship; 10/25 year power output	

ELECTRICAL PERFORMANCE AT STC¹

FLEX-03WS SERIES CIGS MODULE

1010 mm (39.8 in) X 1293 mm (50.9 in)			FLEX-03 160WS	FLEX-03 170WS	FLEX-03 180WS	FLEX-03 190WS
Nominal Power	P_{MPP}	[W]	160	170	180	190
Aperature Efficiency	η	[%]	14.7%	15.6%	16.5%	17.4%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V_{MPP}	[V]	20.5	21.0	21.5	22.0
Maximum Power Current	I_{MPP}	[A]	7.82	8.09	8.37	8.64
Open Circuit Voltage	V_{OC}	[V]	26.2	26.5	26.7	27.0
Short Circuit Current	I_{SC}	[A]	9.40	9.40	9.40	9.40
Maximum Series Fuse Rating		[A]	25			
Maximum System Voltage	(IEC/UL)	[V]	1000/1000			

FLEX-03W SERIES CIGS MODULE

2585 mm (101.8 in) X 1293 mm (50.9 in)			FLEX-03 470W	FLEX-03 480W	FLEX-03 490W	FLEX-03 500W	FLEX-03 510W
Nominal Power	P_{MPP}	[W]	470	480	490	500	510
Aperature Efficiency	η	[%]	15.4%	15.7%	16.0%	16.4%	16.7%
Power Output Tolerance		[W]	+10/-0	+10/-0	+10/-0	+10/-0	+10/-0
Maximum Power Voltage	V_{MPP}	[V]	58.5	59.0	59.5	60.0	60.6
Maximum Power Current	I_{MPP}	[A]	8.04	8.13	8.23	8.33	8.42
Open Circuit Voltage	V_{OC}	[V]	73.9	74.2	74.5	74.8	75.1
Short Circuit Current	I_{SC}	[A]	9.40	9.40	9.40	9.40	9.40
Maximum Series Fuse Rating		[A]	25				
Maximum System Voltage	(IEC/UL)	[V]	1000/1000				

¹Standard Test Conditions (STC): 1000 W/m², 25°C cell temperature, AM 1.5 spectrum



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