



SolaRail™

Electrifying skylines with solar railings

Energy Generating Building Materials:
SolaRail™ Product Datasheet

 MITREX™

⚡ SolaRail™ (Mitrex Solar Railings)

Merging innovation and functionality, Mitrex Solar Railing extends energy generation to building balconies. Nestled within its sleek design are high-efficiency solar cells, discreetly placed between layers of robust, heat-tempered glass.

The magic of SolaRail™ lies in its ability to integrate BIPV seamlessly into your balcony's aesthetic, with all wiring artfully concealed. Whether it's a new project or a retrofit, SolaRail™ turns your balcony into a sustainable energy source.

Mitrex offers SolaRail™ in two variations:

- SolaRail¹: Post and Cap System
- SolaRail²: Base Shoe System



Energy

3.5 Solar Railings can generate enough energy to provide the equivalent of one full EV charge (depending on site conditions and charging requirements).



Design Flexibility

Including a wide range of colour and pattern selections, along with multiple handrail profiles and base options to suit different architectural styles and project requirements



Easy Installation

With multiple installation methods available, the process is easy and smooth, while internal circuitry and wiring integrate seamlessly for a clean, finished appearance.



Sustainability

Combines on-site energy generation with recyclable components, low embodied carbon, and efficient material use to reduce the building's environmental footprint.



Certifications

Engineered to international codes and safety standards, including UL 61730 for solar, and ASTM E2353 for railing performance.



Versatile Application

Versatile for both new construction and retrofit projects, with flexible integration options to suit a wide range of building types and site conditions.



Performance

Built with premium materials and tested for extreme weather, UV, and thermal stress—delivering long-lasting durability for high-performance buildings in any climate.



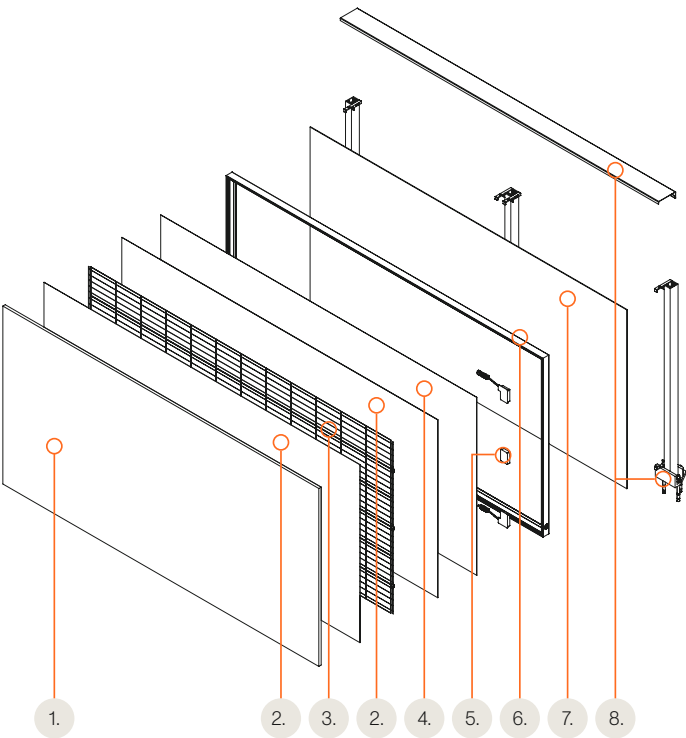
Maintenance

Self-cleaning glass, UV- and corrosion-resistant materials, and a lifetime warranty ensure long-lasting performance with minimal upkeep.



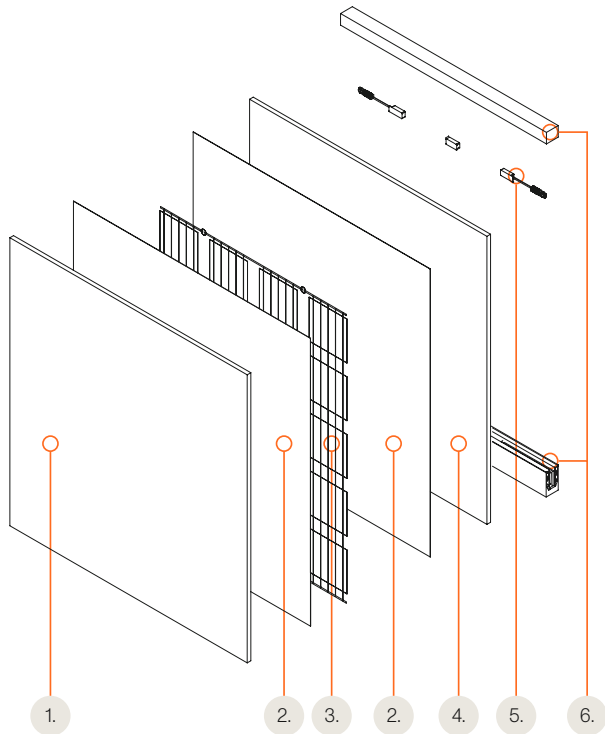
Incentives

Projects may qualify for sustainability incentives such as government rebates, green energy grants, and low-cost financing across North America.



SolaRail¹ Details

- | | |
|---|------------------------------|
| 1. Glass / Customizable Facing - See page 6 | 5. Junction Box |
| 2. Encapsulant | 6. Aluminum Extruded Profile |
| 3. ⚡ Solar Cells | 7. ACM Backing |
| 4. Backsheet | 8. Post and Handrail |



SolaRail² Details

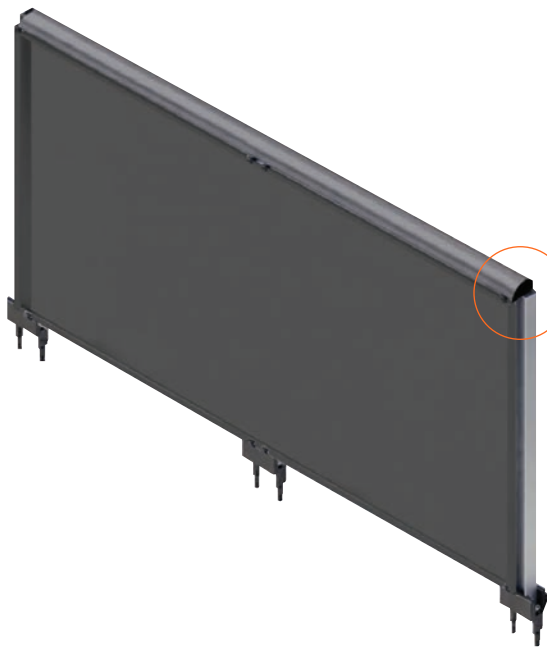
- | | |
|---|-------------------------|
| 1. Glass / Customizable Facing - See page 6 | 5. Junction Box |
| 2. Encapsulant | 6. Base Shoe & Handrail |
| 3. ⚡ Solar Cells | |
| 4. Backing Glass | |

⚡ SolaRail¹ Post and Cap System

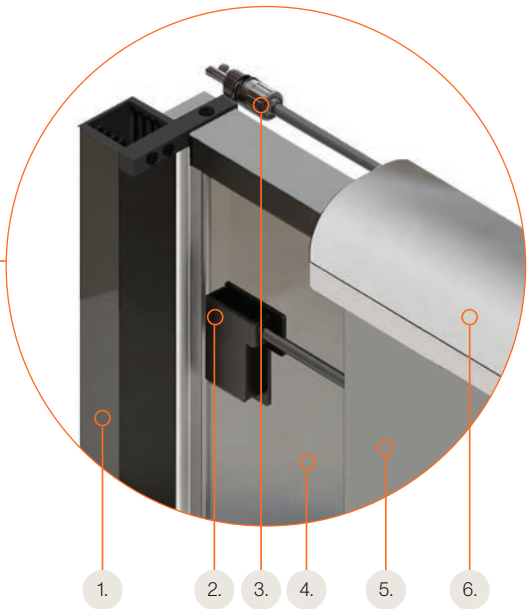
SolaRail¹ is a building-integrated photovoltaic (BIPV) railing system that combines safety, aesthetics, and clean energy generation in one sleek solution. Designed for balconies, terraces, rooftops, and amenity spaces, it transforms traditionally passive railings into power-producing architectural elements, without compromising design intent.

With an easy installation method available, SolaRail¹ enables an easy, smooth installation process while keeping internal circuitry and wiring concealed for a clean, finished appearance.

SolaRail¹ Render



SolaRail¹ Back View Details



1. Metal Post
2. Junction Box
3. Wiring
4. Mitrex Panel
5. ACM Backing
6. Railing Handrail

SolaRail¹ Cell Layout Details



CELL TYPE:
G1 158.75 × 158.75mm (6.25 x 6.25in)
NUMBER OF CELLS:
72 Cells
GAP BETWEEN CELLS:
2mm (0.07in)
TRANSPARENCY:
~0%

⚡ SolaRail² Base Shoe System

SolaRail² is an advanced building-integrated photovoltaic (BIPV) railing system designed to deliver enhanced performance and a more refined architectural expression. With expanded customization options for colours, cell layouts, transparency, handrail profiles, and base configurations, it supports a wide range of architectural visions while maintaining a clean, contemporary aesthetic. Internal circuitry and wiring are fully integrated and concealed within the system, preserving a seamless appearance while supporting reliable energy generation.

SolaRail² Render

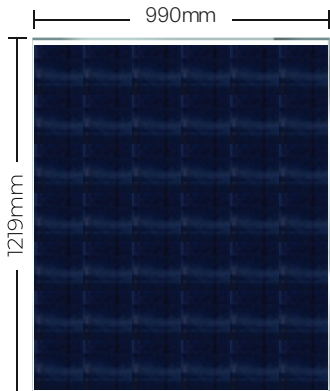


SolaRail² Back View Details



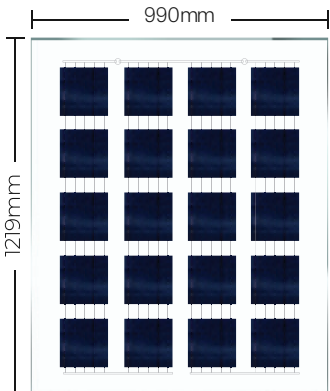
1. Wiring
2. Mitrex Panel
3. Junction Box
4. Top Railing Cap

SolaRail² Opaque Cell Layout Details



CELL TYPE:
G1 158.75 × 158.75mm (6.25 x 6.25in)
NUMBER OF CELLS:
42 Cells
GAP BETWEEN CELLS:
2mm (0.07in)
TRANSPARENCY:
~0%

SolaRail² Semi-Opaque Cell Layout Details



CELL TYPE:
G1 158.75 × 158.75mm (6.25 x 6.25in)
NUMBER OF CELLS:
20 Cells
GAP BETWEEN CELLS:
50mm (2in)
TRANSPARENCY:
~60%

Colors and Patterns

**Finish**

Modules feature satin glass, providing a smooth, low-reflective finish that enhances both aesthetics and performance.

**Color Variety**

Available in 48 colors and patterns, organized into two distinct solar series: Genesis and Exodus.

**Design Flexibility**

SolaRail¹: 2036 × 996mm (80 × 39in)
SolaRail²: 1219 × 990mm (48 × 39in)



ORDER A FREE SAMPLE!

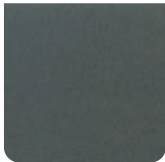
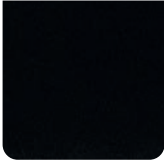
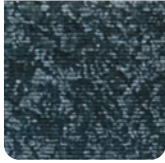
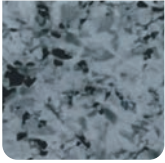
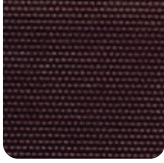
Experience the look and feel of our solar cladding. Scan the QR code or visit www.mitrex.com to order your free Mitrex sample today.

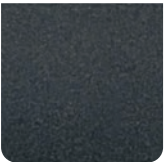
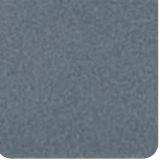
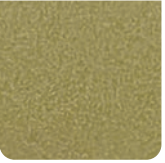
Mitrex Genesis Series

Mitrex Genesis Solar Series seamlessly blends aesthetics with innovation, offering a diverse range of color options that can be optimized to meet any design vision. These advanced solar facings provide both energy generation and architectural versatility, redefining the possibilities of sustainable building design.

Mitrex Exodus Series

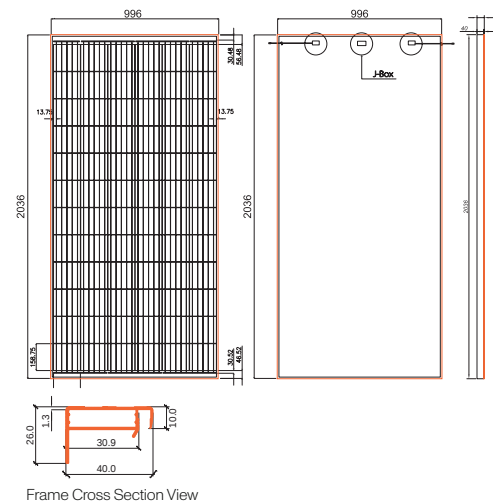
Delivers a sleek, uniform aesthetic with a single-color design per module, ensuring a consistent and sophisticated look. While the color options are fixed, these high-performance solar facings seamlessly integrate renewable energy into any architectural project.

						
Icy White ⚡5W/SQFT	Polaris ⚡9W/SQFT	Ash Beige ⚡11W/SQFT	Gravel Grey ⚡11W/SQFT	Smokey Grey ⚡10W/SQFT	Charcoal Grey ⚡10W/SQFT	Navy Blue ⚡11W/SQFT
						
Turquoise ⚡7W/SQFT	Peridot ⚡5W/SQFT	Dull Yellow ⚡6W/SQFT	Dull Orange ⚡5W/SQFT	Brown ⚡9W/SQFT	Red ⚡9W/SQFT	Pale Rose ⚡7W/SQFT
						
Beige ⚡5W/SQFT	Core Black ⚡18W/SQFT	Blackout ⚡16W/SQFT	Arcturus - Limestone ⚡12W/SQFT	Astra - Limestone ⚡11W/SQFT	Moonstone - Granite ⚡10W/SQFT	Carbo - Granite ⚡15W/SQFT
						
Orbit - Marble ⚡16W/SQFT	Rocksalt - Marble ⚡11W/SQFT	Cassia - Metal ⚡14W/SQFT	Cobaltic - Metal ⚡13W/SQFT			

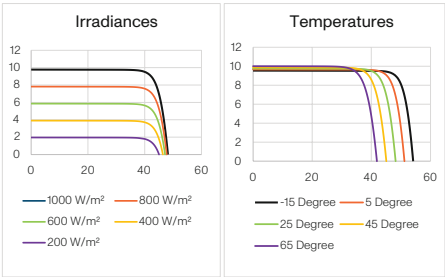
						
Nobel Grey ⚡10W/SQFT	Silver Grey ⚡10W/SQFT	Ironside Grey ⚡13W/SQFT	Monsoon ⚡13W/SQFT	Boulder ⚡13W/SQFT	Natural Grey ⚡13W/SQFT	Iron Filings ⚡14W/SQFT
						
Storm Grey ⚡13W/SQFT	Gun Smoke ⚡13W/SQFT	Ebony Grey ⚡13W/SQFT	Ocean ⚡15W/SQFT	Deep Ocean ⚡15W/SQFT	Blue Jay ⚡14W/SQFT	Sea ⚡14W/SQFT
						
Purple ⚡13W/SQFT	Apple Blossom ⚡8W/SQFT	Irish Coffee ⚡12W/SQFT	Cocoa Bean ⚡9W/SQFT	Wet Sand ⚡12W/SQFT	Gold ⚡11W/SQFT	Espresso Martini ⚡10W/SQFT
						
					Storm Dust ⚡8W/SQFT	Pine Cone ⚡13W/SQFT

General Electrical And Mechanical Data

SolaRail¹ 2036 × 996 mm (80 × 39 in)

Test	Specification	Engineering Drawing
Test Conditions	STC	
Module Power (Pmax)	390W	
Maximum Power Voltage (Vpmax)	41.9V	
Maximum Power Current (Ipmax)	9.31A	
Open Circuit Voltage (Voc)	48.2V	
Short Circuit Current (Isc)	9.77A	
Module Efficiency	19.2%	
Cell Efficiency	22.5% - Monocrystalline Solar Cell	
Maximum System Voltage (VDC)	1000V (IEC/UL)	
Series Fuse Rating	20A	
Power & Other Electrical Specification Tolerance	5%	
Application Classification	Class A	
Measurement Conditions: STC 1000 W/m² - AM 1.5 - Temperature 25°C		
Mechanical Properties	Metric	Imperial
Module Weight	29 kg	64 lbs
Dimensions (H x L x D)	2036 × 996 × 43mm	80.2 × 39.2 × 1.7in
Maximum Surface Load (Wind / Snow)	2400Pa front load / 2400Pa rear load	50.1psf front load / 50.1psf rear load
Design Load	1600Pa front load / 1600Pa rear load	33.4psf front load / 33.4psf rear load
Hail Impact Resistance	ø 25mm at 83 km/h	ø 1in at 51.6 mph
Cells	72 [12×6] Mono-crystalline (158.75 × 158.75mm)	72 [12×6] Mono-crystalline (6.25 × 6.25in)
Glass	3.2mm tempered glass, high transmittance, anti-reflective coating	0.126in tempered glass, high transmittance, anti-reflective coating
Cables & Connectors (Refer to Installation Manual)	1000mm, 1200mm - 4mm², 12 AWG (UL) MC4 from Staubli	39.4in, 47.2in - 0.16in², 12 AWG (UL) MC4 from Staubli
Backsheet	High durability, UV resistant, PV backsheet	
Back Cover	Aluminum Composite Material (ACM)	
Frame	Black extruded aluminum profile	
Bypass Diodes	3 diodes- 30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box	IP68 rated, TUV and UL certified	
Fire Rating	Type II	

Temperature Ratings	I-V Curves
Temperature Coefficient Isc	0.036% /°C
Temperature Coefficient Voc	-0.27% /°C
Temperature Coefficient Pmax	-0.36% /°C
Nominal Module Operating Temperature	42 ± 3°C
Operating Temperature	-40°C ~ +85°C

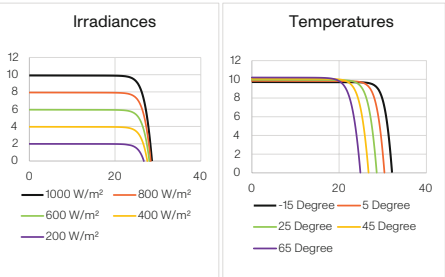


General Electrical And Mechanical Data

SolaRail² Opaque 1219 × 990 mm (48 × 39 in)

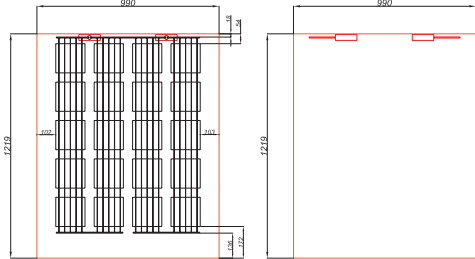
Test	Specification	Engineering Drawing
Test Conditions	Front Only	Bifacial Gain
Module Power (Pmax)	225W	10% 247W 20% 270W 30% 292W
Maximum Power Voltage (Vpmax)	24.3V	24.3V 24.3V 24.3V
Maximum Power Current (Ipmax)	9.26A	10.19A 11.11A 12.04A
Open Circuit Voltage (Voc)	28.6V	28.6V 28.6V 28.6V
Short Circuit Current (Isc)	9.91A	10.90A 11.89A 12.88A
Module Efficiency	18.6%	
Cell Efficiency	22.5% - Monocrystalline Solar Cell	
Maximum System Voltage (VDC)	1000V (IEC/UL)	
Series Fuse Rating	20A	
Power & Other Electrical Specification Tolerance	5%	
Application Classification	Class A	
Measurement Conditions: STC 1000 W/m² - AM 1.5 - Temperature 25°C		
Mechanical Properties	Metric	Imperial
Module Weight	38 kg	84 lbs
Dimensions (H x L x D)	1219 × 990 × 12.5mm	48 × 39 × 0.5in
Maximum Surface Load (Wind / Snow)	2400Pa front load / 2400Pa rear load*	50.1psf front load / 50.1psf rear load*
Design Load	1600Pa front load / 1600Pa rear load*	33.4psf front load / 33.4psf rear load*
Hail Impact Resistance	ø 25mm at 83 km/h	ø 1in at 51.6 mph
Cells	42 [7×6] Mono-crystalline (158.75 × 158.75mm)	42 [7×6] Mono-crystalline (6.25 × 6.25in)
Glass	6 mm tempered glass, high transmittance, anti-reflective coating	0.24 in tempered glass, high transmittance, anti-reflective coating
Cables & Connectors (Refer to Installation Manual)	500mm, 1000mm, 1200mm - 4mm², 12 AWG (UL) MC4 from Staubli	19.6in, 39.4in, 47.2in - 0.16in², 12 AWG (UL) MC4 from Staubli
Backing Glass	6 mm tempered glass	0.24 in tempered glass
Bypass Diodes	3 diodes- 30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box	IP68 rated, TUV and UL certified	
Fire Rating	Spread of flame A, burning brand class C	

Temperature Ratings	I-V Curves
Temperature Coefficient Isc	0.046% /°C
Temperature Coefficient Voc	-0.30% /°C
Temperature Coefficient Pmax	-0.36% /°C
Nominal Module Operating Temperature	42 ± 3°C
Operating Temperature	-40°C ~ +85°C



General Electrical And Mechanical Data

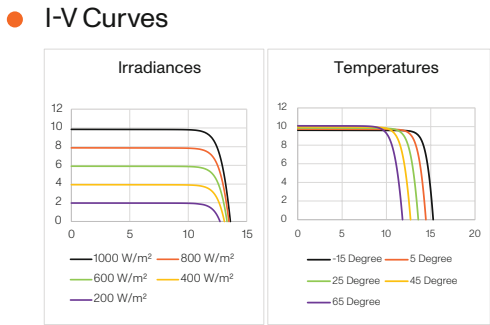
SolaRail² Semi-Opaque 1219 × 990 mm (48 × 39 in)

● Test	● Specification				● Engineering Drawing
Test Conditions	Front Only	Bifacial Gain			
		10%	20%	30%	
Module Power (Pmax)	105W	115W	126W	137W	
Maximum Power Voltage (Vpmax)	11.5V	11.5V	11.5V	11.5V	
Maximum Power Current (Ipmax)	9.13A	10.0A	10.9A	11.9A	
Open Circuit Voltage (Voc)	13.6V	13.6V	13.6V	13.6V	
Short Circuit Current (Isc)	9.85A	10.8A	11.8A	12.8A	
Module Efficiency	8.7%				
Cell Efficiency	22.5% - Monocrystalline Solar Cell				
Maximum System Voltage (VDC)	1000V (IEC/UL)				
Series Fuse Rating	20A				
Power & Other Electrical Specification Tolerance	5%				
Application Classification	Class A				

Measurement Conditions: STC 1000 W/m² - AM 1.5 - Temperature 25°C

● Mechanical Properties	● Metric	● Imperial
Module Weight	38 kg	84 lbs
Dimensions (H x L x D)	1219 × 990 × 12.5mm	48 × 39 × 0.5in
Maximum Surface Load (Wind / Snow)	2400Pa front load / 2400Pa rear load*	50.1psf front load / 50.1psf rear load*
Design Load	1600Pa front load / 1600Pa rear load*	33.4psf front load / 33.4psf rear load*
Hail Impact Resistance	ø 25mm at 83 km/h	ø 1in at 51.6 mph
Cells	20 [5 × 4] Mono-crystalline (158.75 × 158.75mm)	20 [5 × 4] Mono-crystalline (6.25 × 6.25in)
Glass	6 mm tempered glass, high transmittance, anti-reflective coating	0.24 in tempered glass, high transmittance, anti-reflective coating
Cables & Connectors (Refer to Installation Manual)	500mm, 1000mm, 1200mm - 4mm², 12 AWG (UL) MC4 from Staubli	19.6in, 39.4in, 47.2in - 0.16in², 12 AWG (UL) MC4 from Staubli
Backing Glass	6 mm tempered glass	0.24 in tempered glass
Bypass Diodes	2 diodes- 30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box	IP68 rated, TUV and UL certified	
Fire Rating	Spread of flame A, burning brand class C	

● Temperature Ratings	
Temperature Coefficient Isc	0.036% /°C
Temperature Coefficient Voc	-0.27% /°C
Temperature Coefficient Pmax	-0.36% /°C
Nominal Module Operating Temperature	42 ± 3°C
Operating Temperature	-40°C ~ +85°C



Testing and Certifications

● Category	● Test Name	● Test Specification	● Result
Environmental	Salt Spray Resistance	ASTM B117-16	No deleterious effects.
	Resistance to Rapid Freezing and Thawing	ASTM C666/C666M-15	No visible change to panel
	Fluorescent UV Exposure	ASTM G154 -16	No visible change
Fire Safety	Tunnel Test	ASTM E84	FSI = 10; SDI = 200; Class A
	Non-Combustibility (ASTM E136)	ASTM E136	Passed
	Surface Burning Characteristics	CAN/ULC S102	FSR = 0; Class A
	Non-Combustibility (CAN/ULC S114)	CAN/ULC S114	Passed
	Combustibility Parameters (Cone Calorimeter)	CAN/ULC S135	Passed NBCC 2015 requirements
Thermal	Thermal Resistance	ASTM 1363-11	0.20 m²·°C/W (1.12 hr·ft²·°F/BTU)
	Linear Thermal Expansion	ISO 10545-8	11.28 × 10!⁶ /°C
PV Quality	Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval	IEC/UL 61215	Passed
PV Safety	Standard for Photovoltaic (PV) Module Safety	IEC/UL 61730	Passed
Glass Safety	Safety performance of glazing materials used in buildings	ANSI Z97.1	Passed
Railing Safety	Railing Load	ASTM E935-21	Passed
	Railing Impact	ASTM E2353	Passed
Compliance	National Building Code of Canada	NBC 4.1.5.14	Passed
	Ontario Building Code	OBC 4.1.5.14	Passed
	International Building Code	IBC 1607.8.1	Passed
	Building Guards	CSA A500-16	Passed





DEVELOPER:
Tenblock Development
OWNER:
DIS Wilson
GENERAL CONTRACTOR:
KingsGate Restoration Inc
ENGINEER:
NoVi Engineering
BUILDING TYPE:
Residential Building
PROJECT SIZE:
4,000 LF
POWER OUTCOME:
162 KW

Toronto - ON, Canada

Module Details

Solar Glass Type

Mitrex offers SolaRail¹ with Satin Glass.

Solar Glass Mechanical Data

	Imperial	Metric
Thickness (0.13in / 3.2mm)	0.13 ± 0.008in	3.2 ± 0.2mm
Thickness (0.23in / 6mm)	0.23 ± 0.012in	6 ± 0.3mm
Dimensional Tolerance	± 0.04in	± 1.0mm
Density	0.09lbs/in³	2.5gm/cm³
Corner	Radius, Chamfer or cut (0.04-0.16in)	Radius, Chamfer or cut (1.0-4.0mm)
Overall Bow / Warp (EN 12150-1:2015)	0.16in / 39.37in	4.0mm/M / 990mm/M
Local Warp (EN 12150-1:2015)	0.002in / 11.81in	0.5mm / 300mm/M
Bending Strength (EN 12150-1:2015) (0.13in / 3.2mm)	516.06lbs/in	90N/mm
Iron Content (ASS)	<120ppm	
Edge	At least seamed	
Scratch Hardness (Mohs)	5	
Fragmented Particles in 50×50mm (If Tempered) (EN 12150-1:2015)	Min 40 pcs	

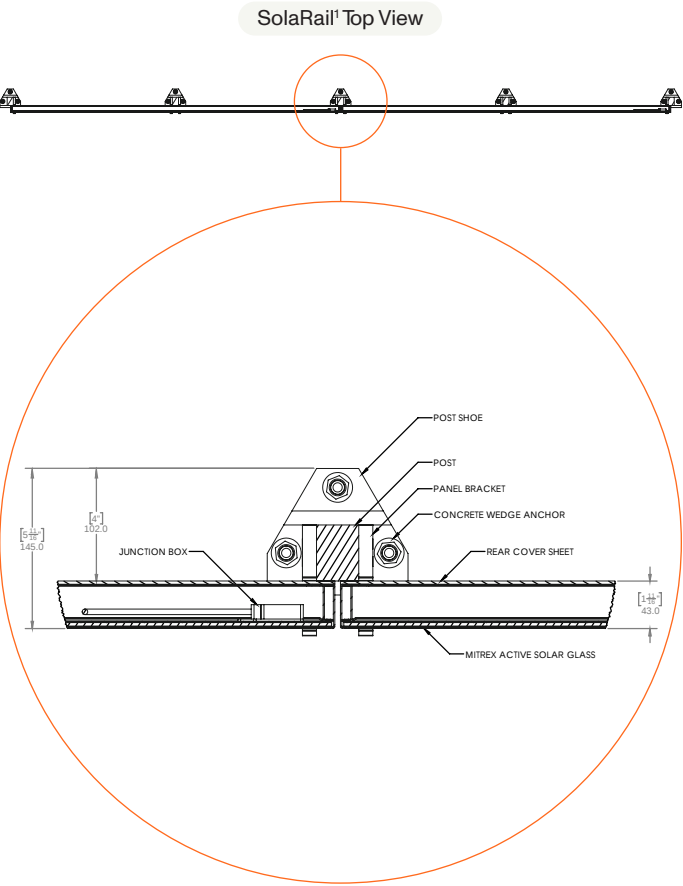
Solar Glass Facing Certifications

	Certification	Imperial	Metric
Absorption By Wt.	ASTM C373	0%	0%
Compressive Strength	-	150,000psi	1,000MPa
Flexural Strength (Dry)	ASTM C158	8,700psi	60MPa
Modulus Rupture	ASTM C158	5,950psi	41MPa
Hardness	ASTM C730	570KHN	

For further mechanical information about solar glass, please check Mitrex solar glass datasheet.

Test	Rating
Smoke And Flame Spread (ASTM E84)	Class A

Two Modules Assembly



Lifetime Warranty

- Mitrex SolaRail™ products physically last the lifetime of the building and beyond as a building product.
- The warranty guarantees that the energy generation will have a minimum energy output of 80% by year 25. However, energy generation will continue after the warranty period ends for as long as the panels are on the wall.
- Our lifetime warranty ensures reliable, durable solar railing as the panels require minimal maintenance and there is zero panel replacement needed for the building lifetime.

- Toll Free

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- Learn More

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Mitrex and Cladify Projects

