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:

- SolaRail[1]: Post and Cap System
- SolaRail[2]: 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

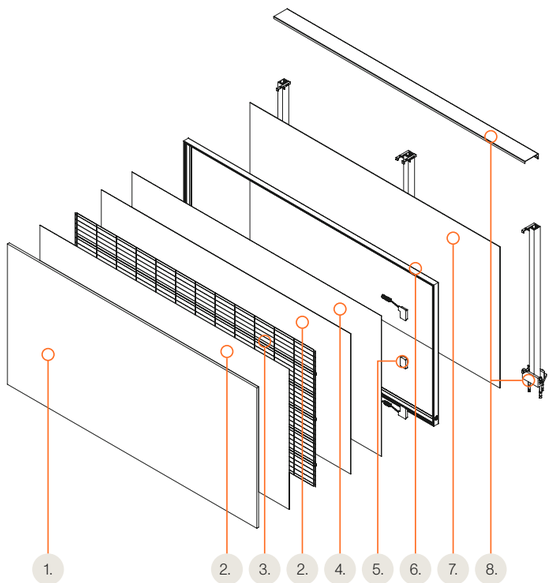
Built with premium materials and tested for extreme weather, UV, and thermal stress—delivering long-lasting durability for high-performance buildings in any climate.

Maintenance

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

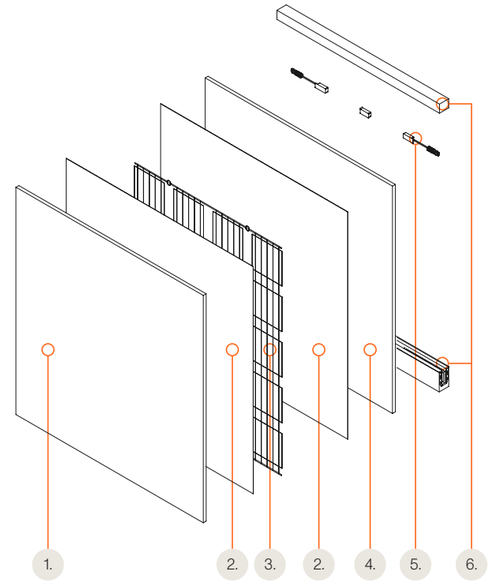
Incentives

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



SolaRail[1] Details

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



SolaRail[2] Details

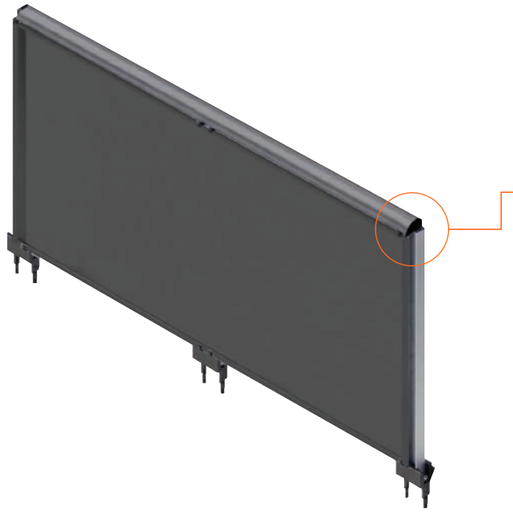
1. Glass / Customizable Facing - See page 6
2. Encapsulant
3. Solar Cells
4. Backing Glass
5. Junction Box
6. Base Shoe & Handrail

SolaRail¹ Post and Cap System

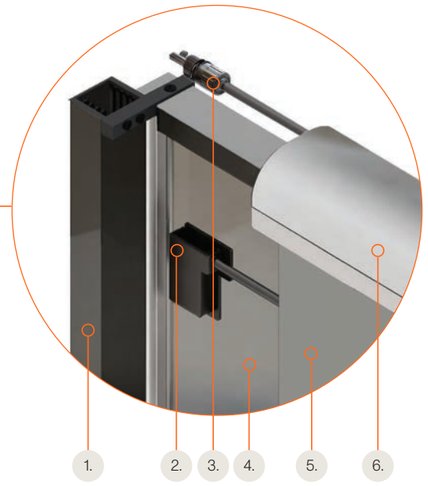
SolaRail¹ is a building-integrated photovoltaic (BIPV) railing system that combines safety, aesthetics, and clean energy generation in one sleek solution. Designed for balconies, terraces, rooftops, and amenity spaces, it transforms traditionally passive railings into power-producing architectural elements, 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

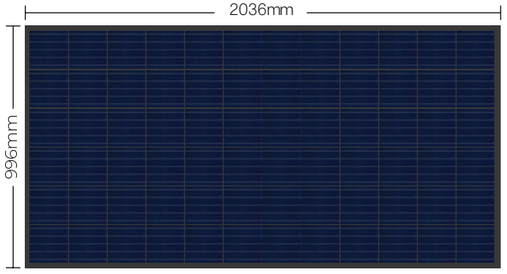


SolaRail¹ Back View Details



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

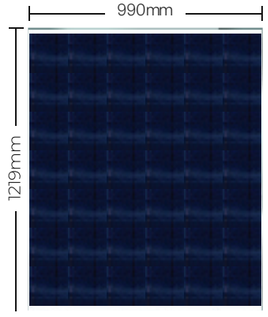
SolaRail² is an advanced building-integrated photovoltaic (BIPV) railing system designed to deliver enhanced performance and a more refined architectural expression. With expanded customization options for colours, cell layouts, transparency, handrail profiles, and base configurations, it supports a 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

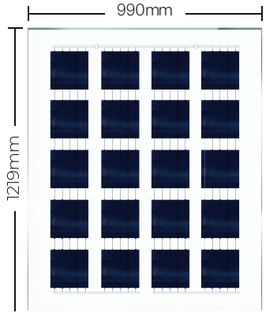
1. Wiring
2. Mitrex Panel
3. Junction Box
4. Top Railing Cap

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

SolaRail[1]: 2036 × 996mm (80 × 39in)
SolaRail[2]: 1219 × 990mm (48 × 39in)

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.


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

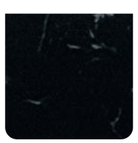

Blackout
16W/SQFT


Arcturus - Limestone
12W/SQFT


Astra - Limestone
11W/SQFT

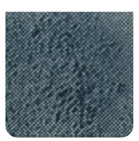

Moonstone - Granite
10W/SQFT


Carbo - Granite
15W/SQFT


Orbit - Marble
16W/SQFT


Rocksalt - Marble
11W/SQFT


Cassia - Metal
14W/SQFT


Cobaltic - Metal
13W/SQFT

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 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.


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

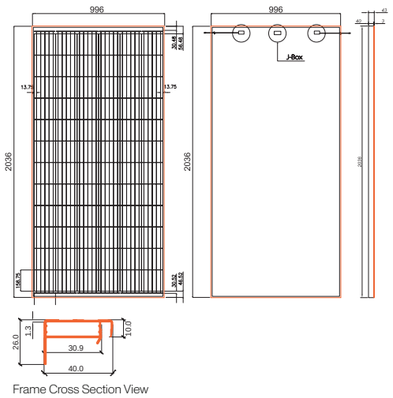
SolaRail[1] 2036 × 996 mm (80 × 39 in)

Test / Specification

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

Engineering Drawing



Frame Cross Section View

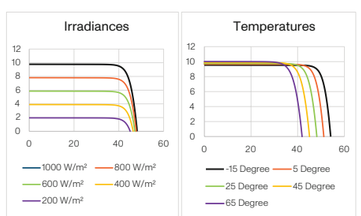
Mechanical Properties / Metric / Imperial

	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

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

I-V Curves



General Electrical And Mechanical Data

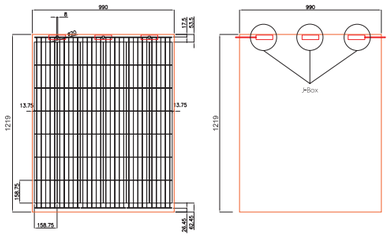
SolaRail[2] Opaque 1219 × 990 mm (48 × 39 in)

Test / Specification

		Bifacial Gain		
Test Conditions	Front Only	10%	20%	30%
Module Power (Pmax)	225W	247W	270W	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

Engineering Drawing



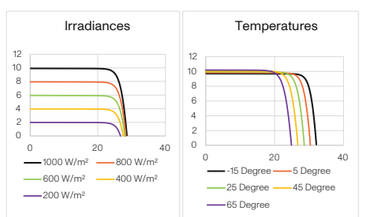
Mechanical Properties / Metric / Imperial

	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

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

I-V Curves



MITREX

General Electrical And Mechanical Data

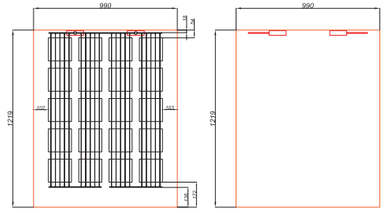
SolaRail² Semi-Opaque 1219 × 990 mm (48 × 39 in)

Test / Specification

		Bifacial Gain		
Test Conditions	Front Only	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

Engineering Drawing



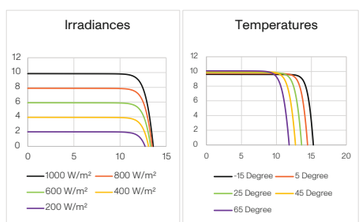
Mechanical Properties / Metric / Imperial

	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

I-V Curves



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 $m^2 \cdot °C/W$ (1.12 $hr \cdot ft^2 \cdot °F/BTU$)
	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

ISO 9001 · ISO 10002 · ISO 10004 · IEC · UL 61730 · UL 61215 · CSA

ANSI Z97.1 · ASTM E136 · ASTM E2353 · ASTM E935-21 · GAIN 40 LEED POINTS

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 SolaRail[1] with Satin Glass.

Solar Glass Mechanical Data

	Imperial	Metric
Thickness (0.13in / 3.2mm) Thickness (0.23in / 6mm)	0.13 ± 0.008in 0.23 ± 0.012in	3.2 ± 0.2mm 6 ± 0.3mm
Dimensional Tolerance	± 0.04in	± 1.0mm
Density	0.09lbs/in^3	2.5gm/cm^3
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

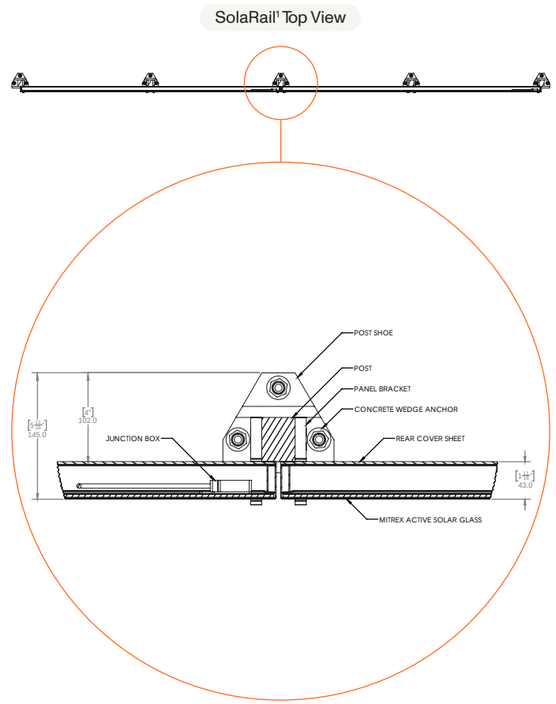
	Certification	Imperial	Metric
Absorption By Wt.	ASTM C373	0%	0%
Compressive Strength	-	150,000psi	1,000MPa
Flexural Strength (Dry)	ASTM C158	8,700psi	60MPa
Modulus Rupture	ASTM C158	5,950psi	41MPa
Hardness	ASTM C730	570KHN	

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

SolaRail[1] Top View



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**

+1 (855) 254 0214

- **Learn More**

mitrex.com

info@mitrex.com

- **Headquarters**

41 Racine Rd, Toronto, ON M9W2Z4, Canada

+1 (416) 497 7120

- **USA Office**

Chrysler Building, 405 Lexington Avenue Floor 26, New York, USA, 10174

+1 (646) 583 4486

Mitrex and Cladify Projects

MITREX™

01/2026 - V2