energía aeterna

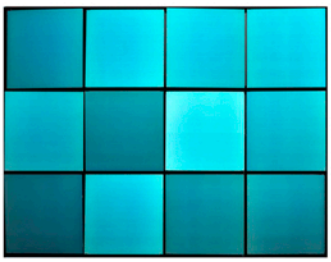
BIPV

NUEVO CONCEPTO DE FOTOVOLTAICA EN FACHADA

SOLUCIONES DE FACHADA

GAMA CROMÁTICA

Dorado, Bronce, Turquesa, Azul, Gris



Descripción

Fotovoltaica en paneles cromáticos para integración arquitectónica. Su diseño en vidrio opaco y su amplia gama de colores permiten infinitas modulaciones de fachada. Tecnología de vanguardia que ofrece nuevas oportunidades estéticas, combinando un diseño arquitectónico flexible con una alta eficiencia solar.

Características

Módulo SI monocristalino de alto rendimiento.
Tratamiento en superficie con tecnología altamente eficiente; sin pinturas, sin tintes.

Es un proceso de sedimentación que colorea el vidrio solar y otorga al material durabilidad y resistencia.
El vidrio está certificado por IFT.

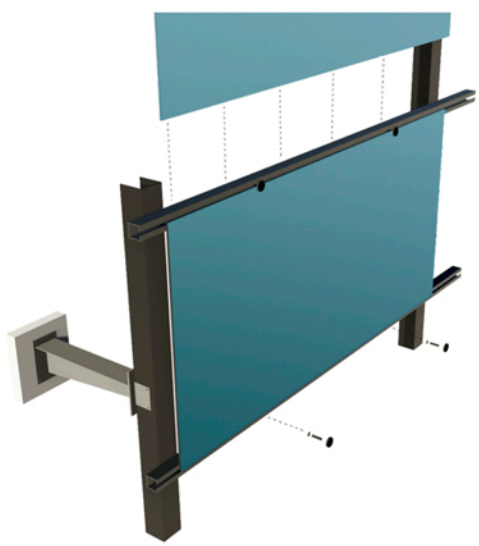
Especificaciones

- Medidas personalizables para modulación de fachadas.
>>> hasta 3800 x 2400
- Se suministra con marco o sin marco.
- Módulos con diferentes grosores y acabados.

Gama de colores

Color	Transmitancia solar
Gris	90 +/- 1%
Azul	88 +/- 1%
Turquesa	88 +/- 1%
Bronce	89 +/- 1%
Dorado	86 +/- 1%

Detalle de montaje

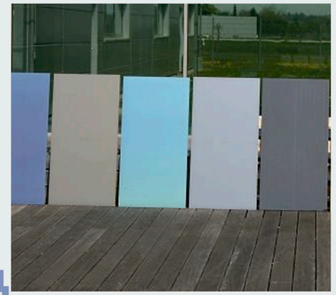


APPLICATIONS

New opportunities for architectural design and energy savings

Copenhagen Project, Switzerland

Satteins Project, Austria



PV Modules produced with Kromatix Solar Glass

KEY BENEFITS

- Attractive opaque colored solar glass with mat finish and excellent performance
- Relevant for photovoltaic modules, solar thermal collectors and cladding elements

With Kromatix™ technology, the solar panels are no longer architectural intruders. They can be harmoniously integrated into the building envelope. Roofs, facades and balconies are now fully available to collect the sun radiation and maximize the solar energy production.

- Maximum use of the building envelope to collect solar energy
- Overcomes legal restrictions in protected areas as there is no visual pollution. Particularly relevant in restricted usage areas in close proximity to airports as there is no glare effect.

انسوليير الإمارات
EMIRATES INSOLAIRE
إحدى شركات دبي للاستثمار
A Subsidiary of Dubai Investments

www.emiratesinsolaire.com

Kromatix™ glass and modules are produced and distributed by Emirates Insolaire LLC. Established in 2013 and headquartered in Dubai, Emirates Insolaire is part of Glass LLC, the glass pioneers in the Middle East. Emirates Insolaire is a joint venture of Dubai Investments PJSC – a leading investment company in the UAE with 40 subsidiaries & joint ventures operating across a diverse range of sectors, and Swissinso Inc., a R&D company pioneering in the development and application of new solar technologies.

دبي للاستثمار
DUBAI INVESTMENTS

www.dubaiinvestments.com

Incorporated in 1995, Dubai Investments PJSC is a leading investment company listed on Dubai Financial Market and owns over 40 subsidiaries and joint ventures across sectors including manufacturing, financial investments, real estate development and mergers and acquisitions. One of its subsidiaries is Glass LLC, the first glass holding company in the Middle East, dedicated to meeting the growing needs of the regional glass industry.
Glass LLC incorporates five companies: Emirates Glass LLC, Emirates Float Glass, Lumiglass Industries, Saudi American Glass Company and Emirates Insolaire.

SWISS INSO
innovative solar solutions

www.swissinso.com

Swissinso Inc. is a R&D company pioneering in the development and application of new solar technologies. Over the last decade it developed the Kromatix™technology in close cooperation with the leading Swiss Federal Institute of Technology [EPFL]. This sustainable technology allows solar solutions to be completely integrated into the architectural design of all types of buildings, the first-of-its-kind.

Emirates Insolaire LLC

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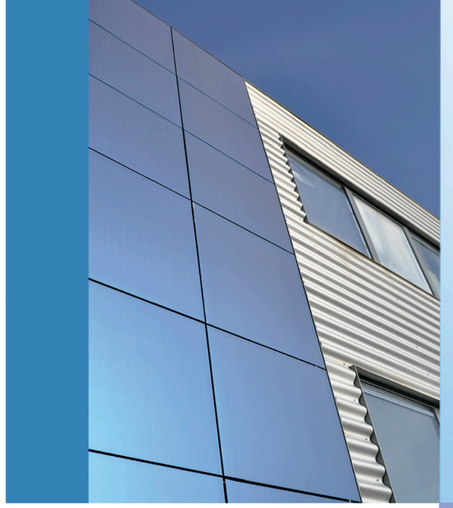

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Kromatix™
by swissinso

Adding Color to the Solar Industry

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INTRODUCTION

Solar energy is the cleanest and most abundant renewable energy source available on the Earth. Modern technology can harness the solar energy for a variety of uses, including generating electricity, providing light or a comfortable interior environment, and heating water for domestic, commercial or industrial use.

Some interesting comparisons to grasp the massive potential of solar energy include:

- One year's worth of solar energy reaching the surface of the Earth would be twice the amount of all non-renewable resources, including fossil fuels and nuclear uranium.
- The solar energy that hits the Earth every second is equivalent to 4 trillion 100-watt light bulbs.
- The solar energy that hits one square mile in a year is equivalent to 4 million barrels of oil.

There are no doubts on the potential of the solar energy. Over the years, the acceptance of solar energy systems as integrated elements of the building's envelope was mainly limited by their unpleasant aesthetic aspects.

This is, however, a thing of the past!

A NEW REVOLUTION

Emirates Insolaire, a UAE-based pioneering company dealing in the development and application of new solar technologies and products, has revolutionized the industry with the first-of-its-kind technology which allows solar solutions to be integrated completely with any type of architectural designs in buildings across the globe.

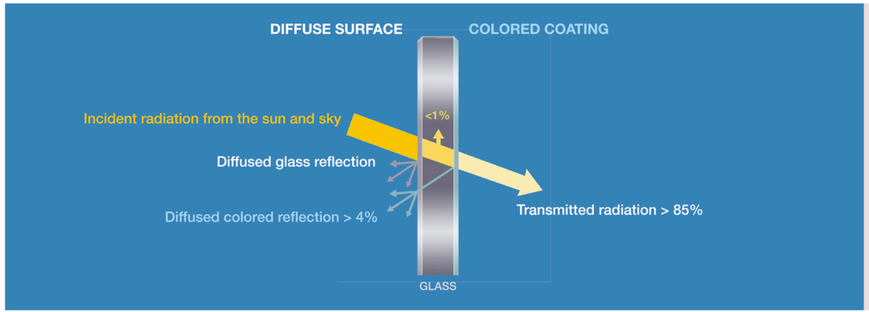
The innovative technology opens a whole new world of opportunities in terms of harnessing solar power without compromising the aesthetic design and façade of buildings, thus leading to enhanced energy savings and a sustainable future!

Kromatix™ Technology

Kromatix™ BY SWISSINSO

Emirates Insolaire uses the Kromatix™ patented technology which provides finished, colored solar glass on both Photovoltaic and Thermal solar panels.

The Kromatix™ technology has been developed in close collaboration with the Swiss Federal Institute of Technology [EPFL] and offers the only attractive alternative to the Black and Dark Blue Panels, without compromising on the performance, efficiency or architectural designs.

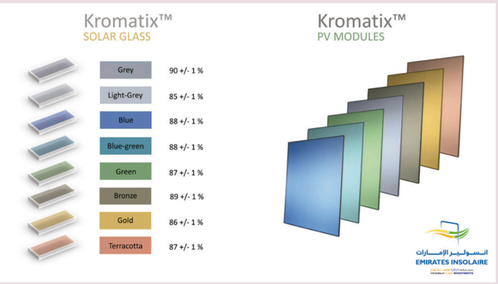


A multi-layered coating is deposited on the inner glass surface by low pressure plasma processes. Its constitutive materials are exclusively characterised by high solar transmittance, minimal absorption and high durability. No pigments or dyes are used so that the color does not fade out with the passage of time or due to Sun exposure.

The color appearance results from the reflection of a narrow spectral band in the visible part of the solar spectrum. The rest of the solar radiation is transmitted to the solar panel to be converted into energy. The colored coating stacks are optimized to offer the best compromise between color intensity and solar panel efficiency.

Kromatix™ GLASS

The CE Certified Kromatix™ Glass is available in various colors and has a beautiful opaque finish, making the inner workings of the solar panels invisible and thus enhancing the overall aesthetics of the solar panels and avoiding glare effects. Kromatix™ Glass can be applied on all available PV technologies.



Color remains stable with time and sun exposure and thanks to the unique technology, average transmittance is above 85%.

The colored solar glass is produced in various thicknesses [from 3mm to 12mm], can be processed in the same way as standard solar glass in order to fit the customer production process.

Kromatix™ MODULES

Kromatix™ Modules are OEM manufactured using Kromatix™ solar glass to the highest industry standards and having all required certification specifications.

The Kromatix™ modules are available as poly or mono-crystalline modules, framed (including colored frames), unframed and as glass/glass modules.

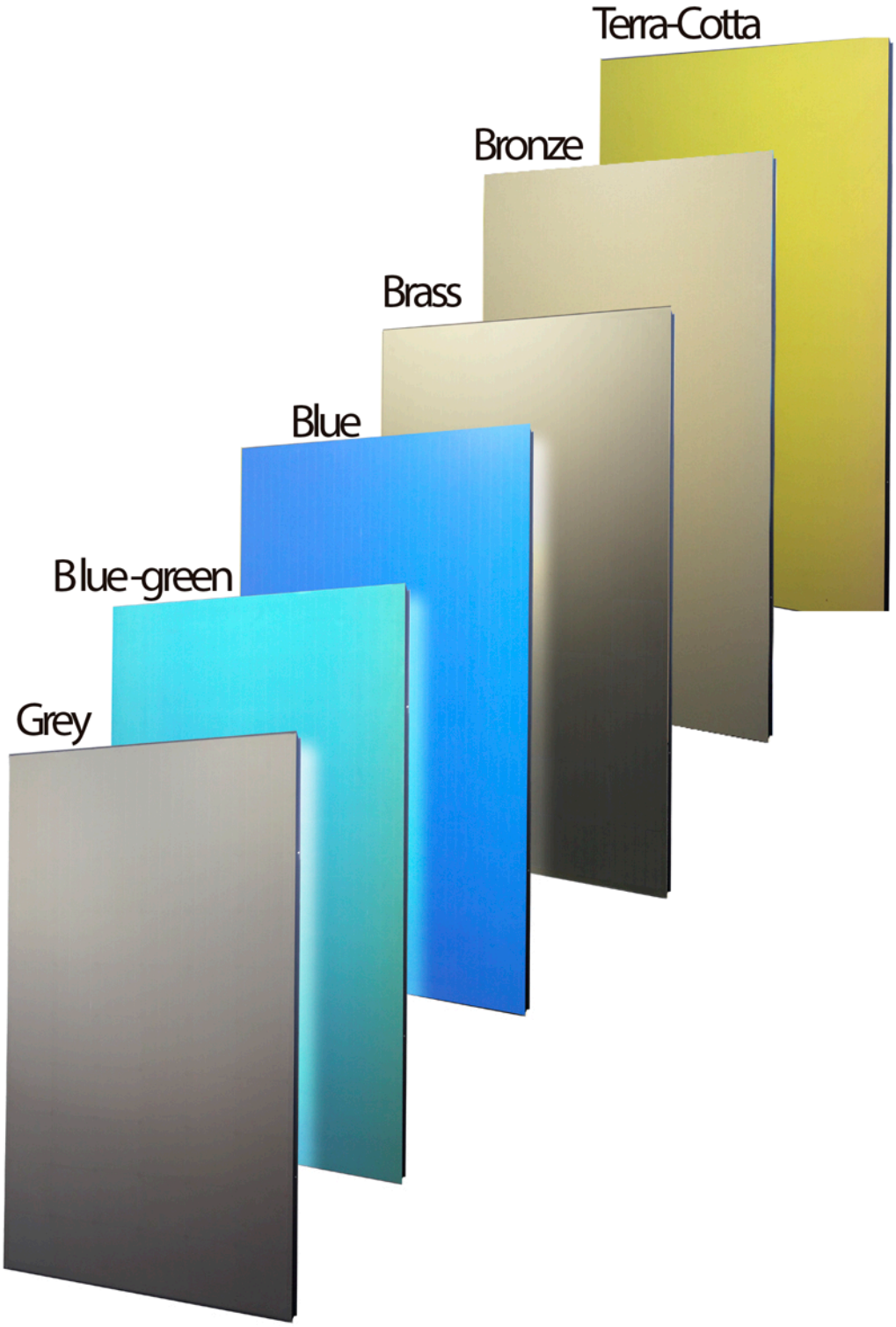
The modules efficiency varies depending on the color used but in average is above 15%.

The modules carry industry standard guarantees.

energía aeterna PV

Kromatix *architectual PV modules*

- Premium quality
- Power output range 255-260 Wp
- 100% EL testing
- Mechanical load up to 5400 Pa
- Low weight
- Positive power tolerance -0/+4,9 W
- Made in Europe
- IEC EN 61215 in progress
- IEC EN 61730 -1 in progress
- IEC EN 61730 - 2 in progress
- PID test passed



Warranty:

- **10** years manufacturing defects
- **12** years limited, 90% output power
- **25** years limited, 80% output power

Electrical parameters at Standard Test Conditions (STC)

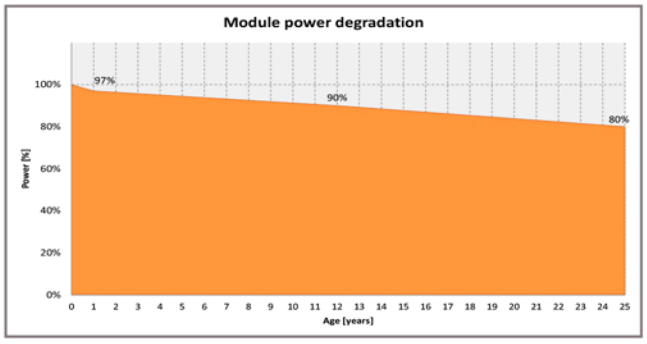
-		Kromatix Grey	Kromatix Grey	Kromatix Blue	Kromatix Brass	Kromatix Bronze	Kromatix TerraCotta
Peak power P_{MPP}	[W]	260	260	260	255	255	260
Peak power tolerance	[W]	-0/+4,9					
Short circuit current I_{SC}	[A]	8,35	8,32	8,36	8,19	8,19	8,37
Open circuit voltage V_{OC}	[V]	39,7	39,8	39,7	39,8	39,8	39,7
Rated current I_{MPP}	[A]	7,98	7,96	7,99	7,83	7,83	8,00
Rated voltage V_{MPP}	[V]	32,6	32,7	32,6	32,7	32,7	32,6
Current and voltage tolerance	[%]	± 3					
Module efficiency	[%]	15,98	15,98	15,98	15,67	15,67	15,98

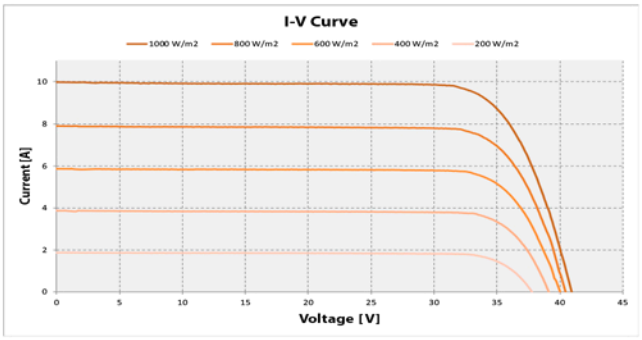
STC: 1000W/m² irradiance, 25 °C cell temperature, AM1,5 g spectrum according to EN 60904-3. Average relative efficiency reduction of 3,4 % at 200 W/m² according to EN 60904-1

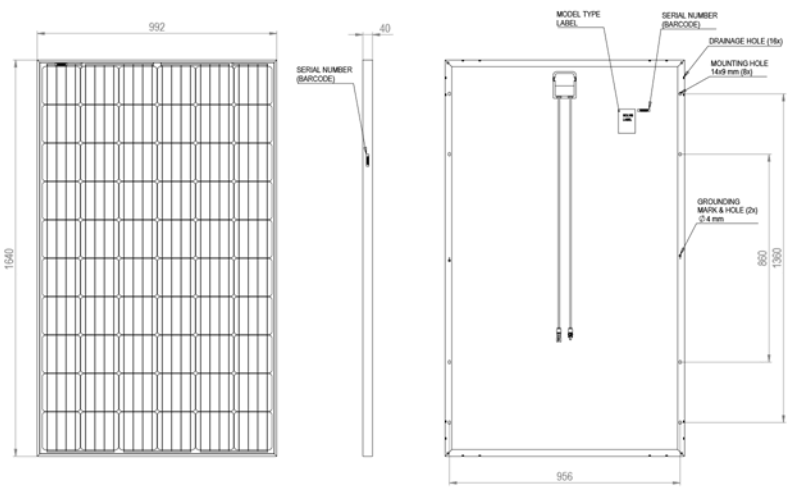
OPERATING CONDITIONS		
Temperature range	[°C]	-40 to +85
Maximum system voltage	[V]	1000
Max. series fuse rating		15A
Limiting reverse current		15A
Maximum surface load capacity		5400 Pa (Snow load)
Resistance against hail		Maximum diameter of 25 mm with impact speed 23 m/s

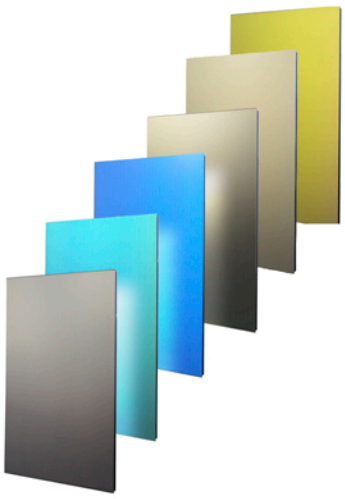
THERMAL CHARACTERISTICS		
Temperature coefficient of P_{MPP}	[%/K]	-0,42
Temperature coeffcient of I_{SC}	[%/K]	0,05
Temperature coeffcient of V_{OC}	[%/K]	-0,33

MECHANICAL DATA		
Dimensions (H x W x D)	[mm]	1640 x 992 x 40
Weight	[kg]	18,3
Solar cells		60 cells, monocrystalline Si, 156 x 156 mm +/- 1mm
Cells encapsulation		Ethylene vinyl acetate (EVA)
Front		Kromatix solar glass, 3,2 mm
Back		Triple layer polymer composite laminated film, black
Frame		Anodized aluminium frame with twin-wall profile and drainage holes
Junction box		IP65 with 3 Bypass diodes
Cable and connectors		Solar cable 4 mm², length 1000 mm, PV4 connectors





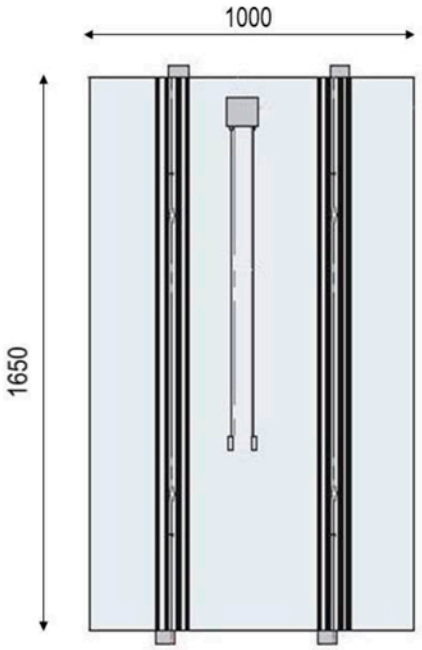




- Custom-made photovoltaic module; semiconductors encapsulated between 2 panes of glass
- Esthetical black design, low reflectance

- Extremely stable setup (walkable); backrails made of zinc coated steel
- Frameless

- High specific electrical power by use of crystalline silicon solar cells
- Good performance at diffuse sunlight and low radiation
- High annual energy yield per installed Wp
- Fully recyclable



Technical Data: Crystalline Silicon Module “Black Line”

Nominal Power P_{max}:	258 Wp (+ 5 W / - 5 W)
Number of Cells in Series:	60
Type of Cell:	Monocrystalline silicon (6” cells)
Current at max. Power I_{mpp}:	8.22 A
Voltage at max. Power V_{mpp}:	31.4 V
Short Circuit Current I_{sc}:	8.63 A
Open Circuit Voltage V_{oc}:	39.0 V
Max. System Voltage:	1,000 V
Max. Reverse Current:	15 A
Temperature Coefficient T_K (P_{max}):	-0.43% / °C
Temperature Coefficient T_K (U_{oc}):	-0.30% / °C
Temperature Coefficient T_K (I_{sc}):	+0.005% / °C
Operation temperature:	-40 to +85 °C
Mechanical Load:	5400 Pa
Dimensions L x W x H:	1650 x 1000 x 9 mm
Thickness of Junction Box:	25 mm
Total thickness:	around 37 mm
Weight:	40 kg

Module efficiency:	15.64%
Module Set Up:	Glass - PVB – Glass
Junction Box:	MC: PV-JB/WL-V
Cables:	4 mm² ; 1000 mm
Connectors:	MC 4
Front Cover:	Tempered satined Glass 4 mm
Back Cover:	Tempered Glass 4 mm
Frame:	Frameless
Backrails:	Zinc coated steel
Warranty:	20 year power output warranty (80% of nominal power output)

Certificates: Modules are certified for mechanical and electrical operational safety for the whole life expectancy (IEC 61215, IEC 61370)

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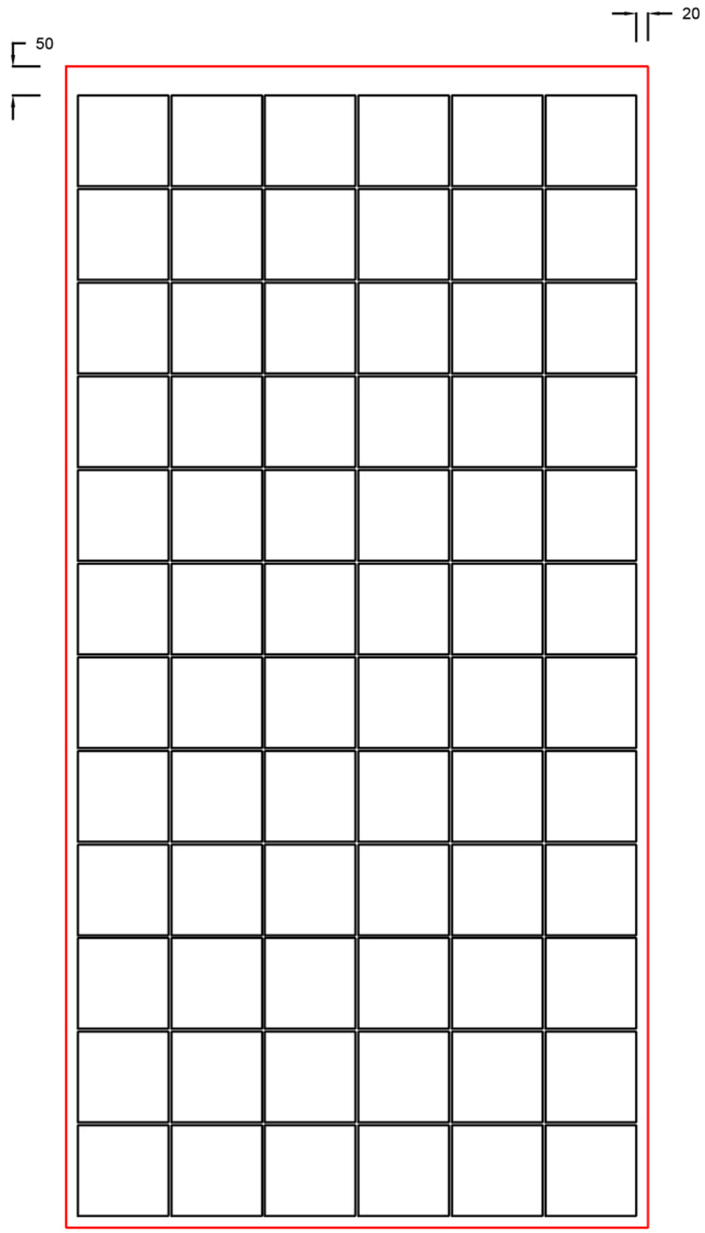
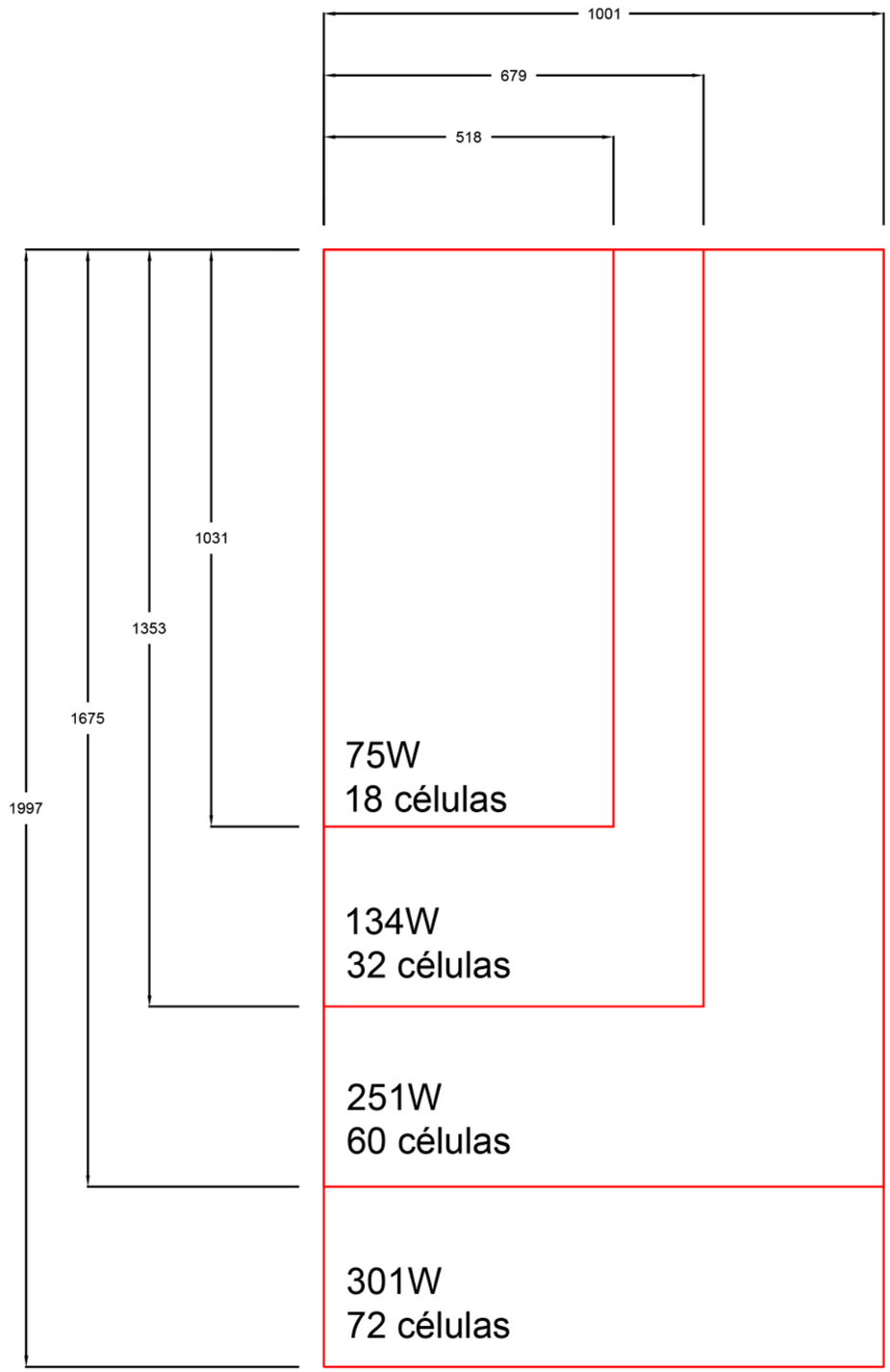
PV





Glass Load Resistance Report -- Emirates Insolaire

Wednesday, November 07, 2018

Glazing Information

Edge Supports: 4 Sides
Glazing Angle: 90°
Lite Dimensions:

Width:	1660 mm
Height:	990 mm

Project Details

Project Name: Emirates Insolaire
Location: Dubai
Comments: 4mm low iron acid etch glass, FT +Pvb+6mm black ceramic FT

Glass Construction (Rectangular)

Single Glazed Lite

Glass Type:	Fully Tempered
Nominal Thickness:	10.0 mm
Interlayer Type:	PVB

Short Load Duration, Resistance, and Deflection Data

Load (~ 3 sec.):	1400 kPa
Load Resistance:	> 15 kPa
Approximate center of glass deflection:	> 50 mm

Conclusion

Based on your design information, the load resistance is less than specified loading.

Statement of Compliance

Procedures followed in determining the resistance of this window glass are in accordance with ASTM E1300-09/12.

Disclaimer:

This software can be used to determine the load resistance of specified glass types exposed to uniform lateral loads of short or long duration subject to the following conditions:

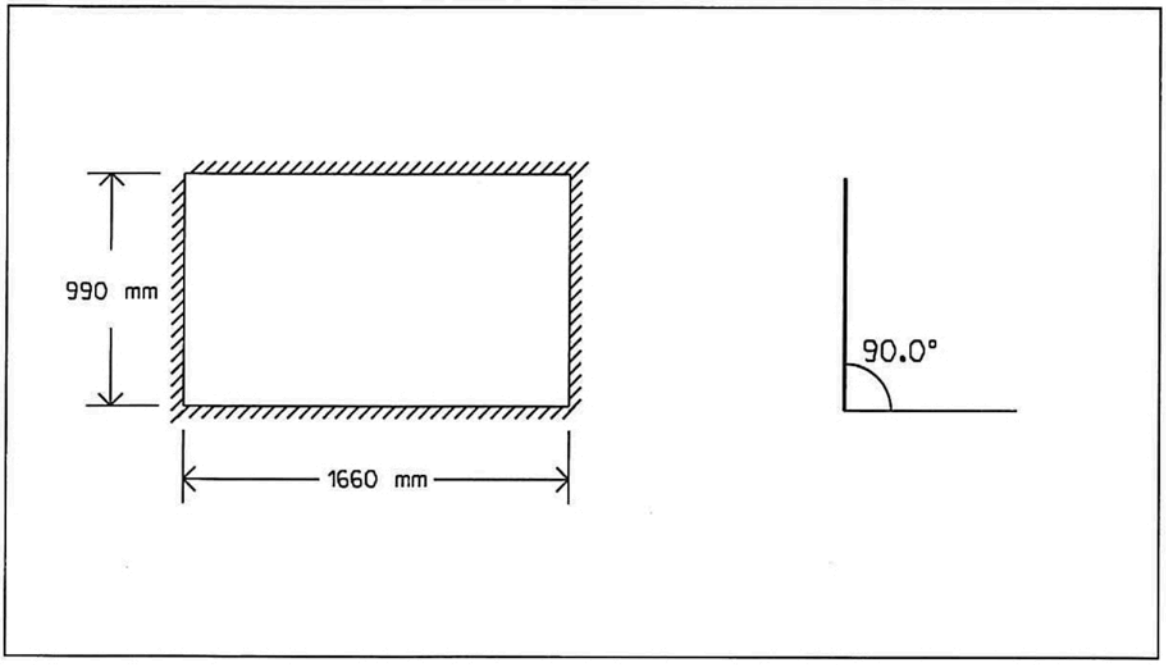
- The glass is free of edge and surface damage and has been properly glazed in the opening in conformance with the manufacturer's recommendations.
- Procedures exist to determine load resistance for rectangular glass assemblies that are:
  a. Continuously supported along all four edges,
  b. Continuously supported along three edges,
  c. Continuously supported along two parallel edges, and
  d. Continuously supported along one edge.
- The software user has the responsibility of selecting the correct procedures for the required application from the software.
- The stiffness of members supporting any glass edge shall be sufficient that under design load, edge deflections shall not exceed L/175, where L denotes that length of the supported edge.
- The manufacturer states that the Safety Plus II 0.090 Polyurethane Large Missile Resistant interlayer is comparable to the PVB interlayer.
- The non-factored load values for laminated glass are representative of test data and calculations performed for an interlayer at a temperature of 50° C (122° F).

For other limiting conditions that may apply, refer to Section 5 of ASTM E1300 and local building codes.

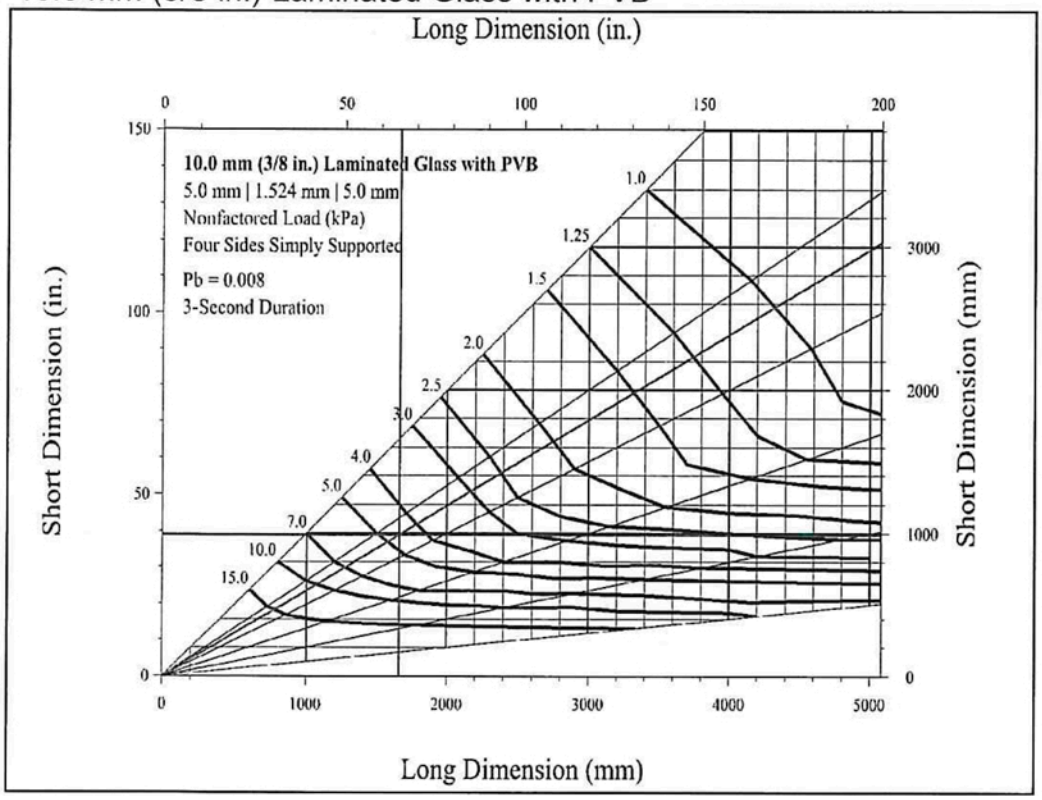
Neither SDG nor GANA guarantees and each disclaims any responsibility for any particular results relating to the use of the Window Glass Design 5 Software Program. SDG and GANA disclaim any liability for any personal injury or any loss or damage of any kind, including all indirect, special, or consequential damages and lost profits, arising out of or relating to the use of the Window Glass Design 5 Software Program.

Prepared by: _____ on 07-Nov-18
P.Mohamed Rasool Gani

Lite Sketch



10.0 mm (3/8 in.) Laminated Glass with PVB



Short Duration Load

Non-Factored Load:	4.57 kPa
Glass Type Factor:	4.00
Load Resistance:	> 15 kPa
Approximate Deflection:	> 50 mm