



PHOTOVOLTAIC GLASS QUOTATION



PROJECT DATA

Project	Bildwell House
City	Cambridge
Country	United Kingdom
Company	JPJ Installations Ltd
Contact	Lee Sharp

This quotation is based on the information provided by JPJ Installations Ltd. We have considered a total area of integration of 57.07 sqm for this *Building Integration Photovoltaic* solution leading a nominal power of 1.6 kWp.

We have provided several options in terms of size and thickness that could be modified and customized if client would prefer a different option. Anyway, this quotation is merely a product description and pricing proposal. The client is responsible to establish the structural needs of the architectural photovoltaic glazing for the given project according to full system structural calculations and local building codes.

The present document shows:

- Quotation.
- Feasibility Study for a Demo Building.
- Terms & Conditions.
- Projects & References.
- Awards & Recognitions.
- Annex 1. Technical Data Sheet.
- Annex 2. Cost Recovery Incentives.





QUOTATION

AMORPHOUS SILICON TECHNOLOGY 30%

Based on your requirements, please find below your quotation.

■ PHOTOVOLTAIC GLASS QUOTATION

	Thickness (mm)	Length (mm)	Width (mm)	Power (Wp/unit)	Quantity (pcs)	Unit Price (€/unit)	Subtotal (€)	(€/sqm)	
GL.01	535 / 12Arg/ 6e	1.241	2.579	89	5	1.368,73	6.844 €	427,66 €	
GL.02		996	2.516	70	5	1.073,41	5.367 €	428,35 €	
GL.03		967	2.683	73	11	1.111,05	12.222 €	428,24 €	
TOTAL							21	24.432 €	428,10
APPLICABLE INCENTIVES:							-7.574 €	-132,71	
TOTAL INVESTMENT AFTER INCENTIVES							16.858 €	295,39	

Go to Annex 2

■ PREFERENTIAL FINANCING OPTIONS

The minimum amount to opt for this kind of financing conditions is 1,000,000 euros, exceptionally, and if the project meets certain conditions, it could be lowered up to 500,000 euros. We would be pleased to reevaluate the project, in order to increase the surface covered by photovoltaic glass, and reach the minimum level. Besides, our products have up to 70% discounts, when increasing the quantity ordered. Please take into account that if your budget reach the 1,000,000 euros level, you would only need to do an upfront payment of 150,000 euros.

(€) (€/sqm)

TOTAL UPFRONT PAYMENT

(15% of the total Onyx Solar glass budget)

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FEASIBILITY STUDY FOR A DEMO BUILDING

LONDON a-Si

Enjoy the properties of the first and only glass in the market that generates free electricity for your building while providing thermal and acoustical insulation, day lighting and sun control, as required by design. This combination of active and passive properties leads to outstanding return on the investments.

ENERGY SAVINGS



ENERGY COST WITH ONYX SOLAR GLASS	(EUR/kWh)	0,08 €
Electricity cost guaranteed for the next 30 years.		
REDUCTION IN HVAC ENERGY DEMAND	(%)	15%
Maximum reduction in HVAC energy demand in this city.		
AVERAGE REDUCTION OF ENERGY DEMAND	(EUR/sqm)	457 €
Average reduction of energy demand per square foot of Glass from energy generation and the HVAC savings in 30 years.		

RETURN ON INVESTMENT



IRR (30 years)	(%)	8%
Internal Rate of Return: average annual return during the first 30 years of the investment.		
IRR (20 years)	(%)	7%
Internal Rate of Return: average annual return during the first 20 years of the investment.		
IRR (10 years)	(%)	1%
Internal Rate of Return: average annual return during the first 10 years of the investment.		
TIMES THE INVESTMENT (period of 30 years)	(times)	4
Number of times that the amount invested is received during the investment period of 30 years. (Average Reduction of Energy Demand /Investment)		



DOWNLOAD THE FULL FEASIBILITY STUDY OF THE DEMO BUILDING

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TERMS & CONDITIONS

Terms and Conditions: **V.A.T. not included**
Valid until: **30 days**
Delivery Terms (Incoterms 2010): **EX-WORKS** (our factory)
Payment terms: **A*/ 15% Prepayment – 85% Financed for 5 to 12 years, subject to approval**
B/ 100% Prepayment
C/ 50% Prepayment - 50% L/C

Unless otherwise stated, this quote does not include:

- Work management and assistance at the jobsite.
- Transportation costs.
- Profiles and/or other structural fixing systems for the glass (to be defined according to the architectural project).
- Special packaging for particular transportation.
- Installation of materials.
- Structural design and calculus.
- Execution of the electrical design.
- Supply of electrical wiring for interconnection between units.
- Permits, authorizations and/or other certifications.
- Packaging recycling
- All any other item not stated in this quote.

*Applicable to minimum orders of 1.000.000 EUR, and exceptionally to orders above 500.000 EUR

General note:

This quote has been calculated based on the information and drawings provided. Should the items quoted in this document change in nature, size, quantities, and/or result modified after the quote is calculated, such quote may vary too.

March 9th, 2017

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PROJECTS & REFERENCES



Please, see Onyx Solar **Projects & References** in the following link.

[DOWNLOAD PDF](#)



Please, see Onyx Solar **Corporate Video** in the following link.

[SEE VIDEO](#)

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CUSTOMERS REFERENCES

Onyx Solar takes part in the construction of the largest photovoltaic skylight in the world, Bell Works. This new skylight is both aesthetically pleasant and, according to our clients, shockingly affordable.

"Economics of replacing the existing glass with photovoltaic glass were **shockingly affordable (...)** **more affordable than simple glass**"

"Our experience with Onyx has been great and we will gladly recommend using Onyx. We would recommend to our friends and acquaintances in the development world"

"Onyx is a company you can consider and **we would vouch for them 100%**",

Ralph Zucker

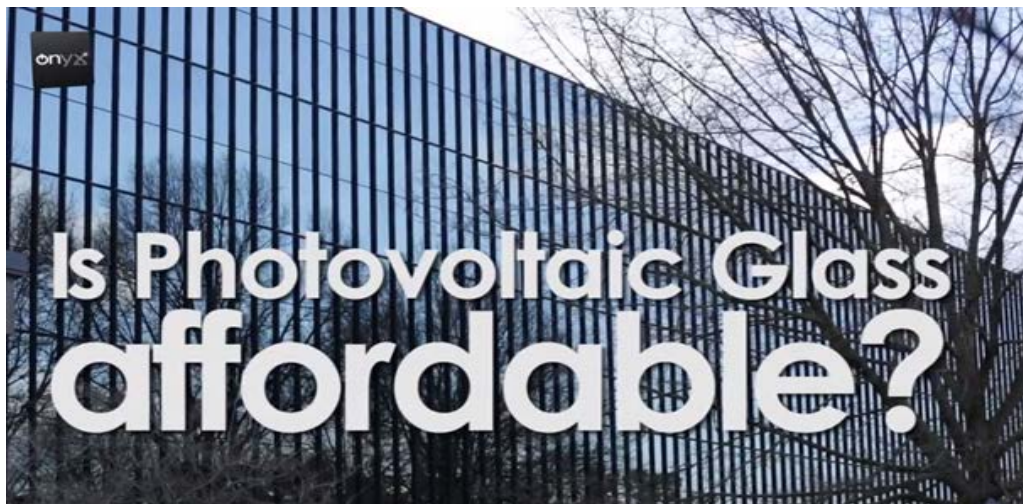
President of Somerset Development

"The economics for solar glass was extremely pleasantly surprising as to the affordability of the glass"

"Day one cheaper than standard conventional glass"

Joel Shandelman

CTO/Chief Energy Officer at Bell Works



Please, see **The Economics Behind Photovoltaic Glass - Bell Works Project Video** in the following link.



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AWARDS & RECOGNITIONS



Best Practices Awards 2016.
Global Leader in Building Integrated Photovoltaic Glass.

"Onyx Solar Growth Potential is impressive"

"Onyx Solar Rich Experience and Innovation Excellence has enabled it to continuously roll out new solutions".
Frost & Sullivan, USA



Sustainable Building Awards 2016.
Global Best Photovoltaic Glass Provider 2016 & Most Innovative Photovoltaic Glass Project: Miami Heat's American Airline Arena.

"Awards are focussed on rewarding the efforts of the firms who have helped shape the world of Eco-friendly and Sustainable buildings across the globe".
Build Magazine, UK



Most Innovative Glass Product 2015.
Low-E Photovoltaic Glass.

"Award winners push the envelope of aesthetics, efficiency, and performance".
Glass Magazine, USA



Best of Products Award 2015.
Walkable Photovoltaic Floor.

"A game changer".
The Architects' Newspaper, USA



Best of What's New Awards 2015.
Best Engineering Product: Photovoltaic Floor.

"Popular Science honors innovations that are brilliant, revolutionary, and bound to shape the future".
Popular Science, USA



Solar Industry Awards.
Best Turnkey Project 2015.

"Innovative manufacturing and product approaches that have the potential to change the way we live".
Solar Power Management, UK



Best project in Colorado 2015, Denver Science Pyramid.
Best project in the New York Area 2014, Novartis project.

"These extraordinary projects are selected by juries of local prominent industry professionals".
ENR, USA





ANNEX 1

TECHNICAL DATA

General note for Amorphous Silicon Technology:

The nominal power of PV modules indicates the power generated under Standard Test Conditions (STC). Photovoltaic modules may produce more current and/or voltage under actual operating conditions than in Standard Test Conditions. The electrical characteristics are within $\pm 10\%$ of the indicated Isc and Voc values under STC. Electrical parameters, shown in the data sheet are considered **after light-soaking degradation process**. The uncertainty of the measurements can be established in $\pm 4,72\%$.

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TECHNICAL DATA - GL.01

PHOTOVOLTAIC GLASS		1241 x 2579
		XL Vision (30%)
Electrical data test conditions (STC)		
Nominal peak power	89	P _{mpp} (Wp)
Open-circuit voltage	201	V _{oc} (V)
Short-circuit current	0,77	I _{sc} (A)
Voltage at nominal power	138	V _{mpp} (V)
Current at nominal power	0,65	I _{mpp} (A)
Power tolerance not to exceed	± 5	%
STC: 1000 w/m ² , AM 1.5 and a cell temperature of 25°C, stabilized module state.		
Mechanical description		
Length	1241	mm
Width	2579	mm
Thickness	34,24	mm
Surface area	3,20	sqm
Weight	178	Kgs
Cell type	a-Si	Thin Film
Transparency degree	XL	Vision (30%)
Front Glass	5 mm	Tempered Glass
PV Active Glass	3,2 mm	Float Glass
Rear Glass	5 mm	Tempered Glass
Air Chamber	12 mm	Argon Chamber
Inner Glass	6 mm	Tempered Glass Low-e
Thickness encapsulation	3,04 mm	PVB Foils
Category / Color code		
Junction Box		
Protection	IP65	
Wiring Section	2,5 mm ² or 4,0 mm ²	
Limits		
Maximum system voltage	1000	V _{sys} (V)
Operating module temperature	-40...+85	°C
Temperature Coefficients		
Temperature Coefficient of P _{mpp}	-0,19	%/°C
Temperature Coefficient of V _{oc}	-0,28	%/°C
Temperature Coefficient of I _{sc}	+0,09	%/°C

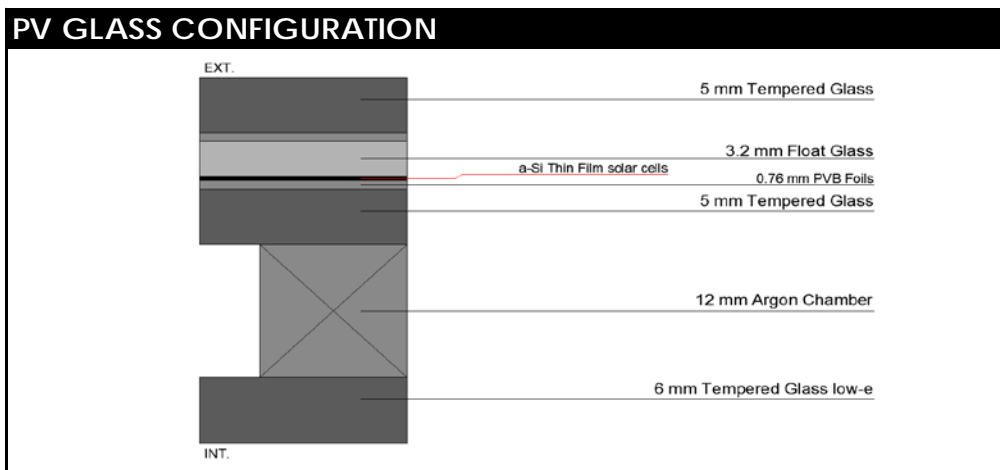
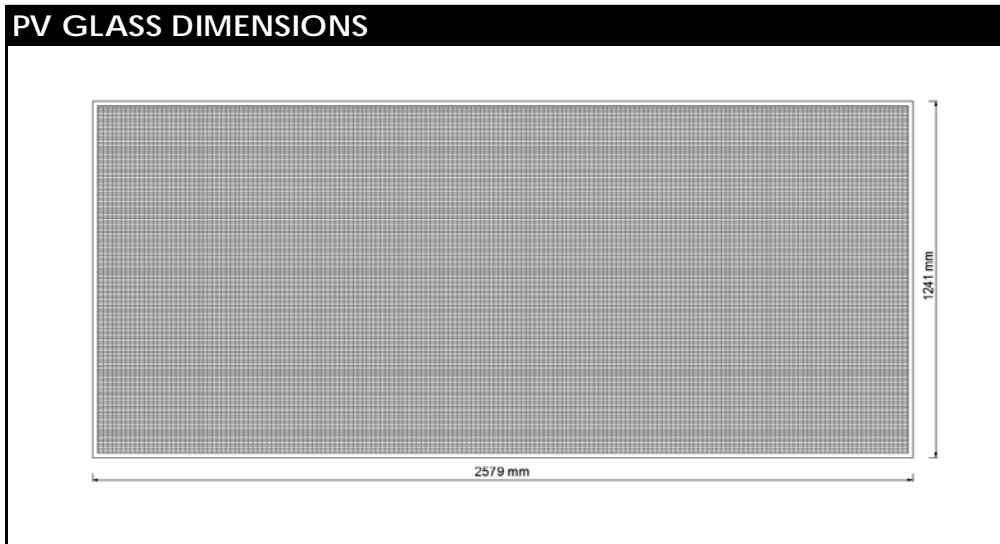
* All technical specifications are subject to change without notice by Onyx Solar

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TECHNICAL DATA - GL.01



GLASS PROPERTIES	Onyx Equivalent Glass
Solar Factor/SHGC	17%
Light Transmission	30%
UV Transmission	< 1%
Light Reflection	8%
U-value [W/sqm.K]	1,2
Peak Power [Wp/sqm]	28,0

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TECHNICAL DATA - GL.02

PHOTOVOLTAIC GLASS		996 x 2516
		XL Vision (30%)
Electrical data test conditions (STC)		
Nominal peak power	70	P _{mpp} (Wp)
Open-circuit voltage	196	V _{oc} (V)
Short-circuit current	0,62	I _{sc} (A)
Voltage at nominal power	135	V _{mpp} (V)
Current at nominal power	0,52	I _{mpp} (A)
Power tolerance not to exceed	± 5	%
STC: 1000 w/m ² , AM 1.5 and a cell temperature of 25°C, stabilized module state.		
Mechanical description		
Length	996	mm
Width	2516	mm
Thickness	34,24	mm
Surface area	2,51	sqm
Weight	139	Kgs
Cell type	a-Si	Thin Film
Transparency degree	XL	Vision (30%)
Front Glass	5 mm	Tempered Glass
PV Active Glass	3,2 mm	Float Glass
Rear Glass	5 mm	Tempered Glass
Air Chamber	12 mm	Argon Chamber
Inner Glass	6 mm	Tempered Glass Low-e
Thickness encapsulation	3,04 mm	PVB Foils
Category / Color code		
Junction Box		
Protection	IP65	
Wiring Section	2,5 mm ² or 4,0 mm ²	
Limits		
Maximum system voltage	1000	V _{sys} (V)
Operating module temperature	-40...+85	°C
Temperature Coefficients		
Temperature Coefficient of P _{mpp}	-0,19	%/°C
Temperature Coefficient of V _{oc}	-0,28	%/°C
Temperature Coefficient of I _{sc}	+0,09	%/°C

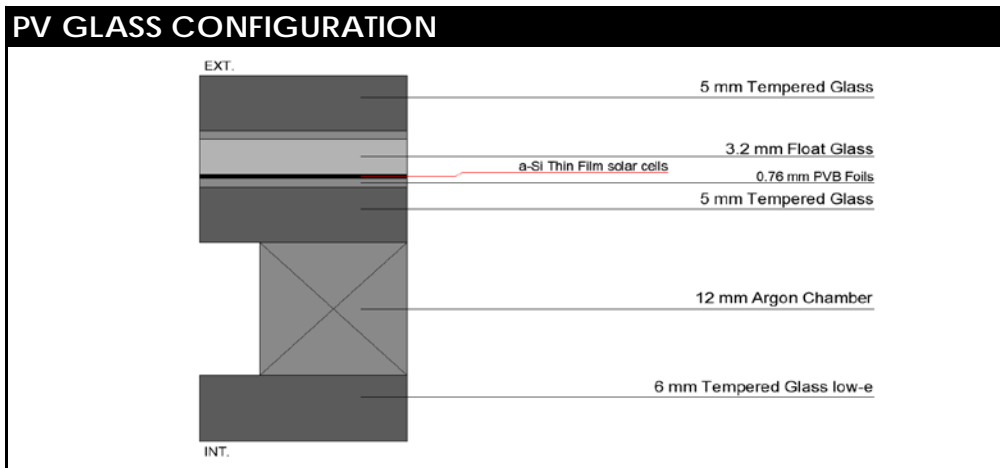
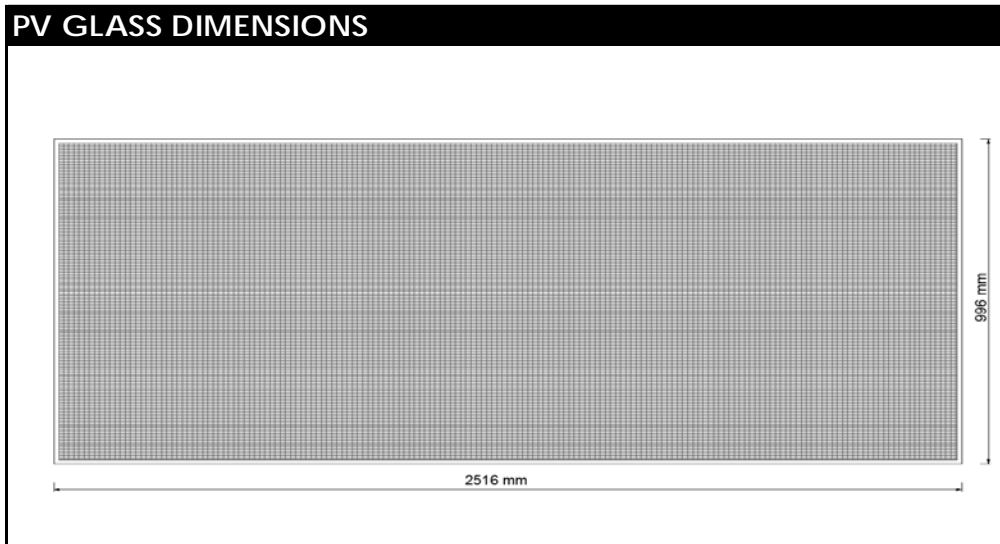
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TECHNICAL DATA - GL.02



GLASS PROPERTIES	Onyx Equivalent Glass
Solar Factor/SHGC	17%
Light Transmission	30%
UV Transmission	< 1%
Light Reflection	8%
U-value [W/sqm.K]	1,2
Peak Power [Wp/sqm]	28,0

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TECHNICAL DATA - GL.03

PHOTOVOLTAIC GLASS		967 x 2683
		XL Vision (30%)
Electrical data test conditions (STC)		
Nominal peak power	73	P _{mpp} (Wp)
Open-circuit voltage	209	V _{oc} (V)
Short-circuit current	0,60	I _{sc} (A)
Voltage at nominal power	144	V _{mpp} (V)
Current at nominal power	0,50	I _{mpp} (A)
Power tolerance not to exceed	± 5	%
STC: 1000 w/m ² , AM 1.5 and a cell temperature of 25°C, stabilized module state.		
Mechanical description		
Length	967	mm
Width	2683	mm
Thickness	34,24	mm
Surface area	2,59	sqm
Weight	144	Kgs
Cell type	a-Si	Thin Film
Transparency degree	XL	Vision (30%)
Front Glass	5 mm	Tempered Glass
PV Active Glass	3,2 mm	Float Glass
Rear Glass	5 mm	Tempered Glass
Air Chamber	12 mm	Argon Chamber
Inner Glass	6 mm	Tempered Glass Low-e
Thickness encapsulation	3,04 mm	PVB Foils
Category / Color code		
Junction Box		
Protection	IP65	
Wiring Section	2,5 mm ² or 4,0 mm ²	
Limits		
Maximum system voltage	1000	V _{sys} (V)
Operating module temperature	-40...+85	°C
Temperature Coefficients		
Temperature Coefficient of P _{mpp}	-0,19	%/°C
Temperature Coefficient of V _{oc}	-0,28	%/°C
Temperature Coefficient of I _{sc}	+0,09	%/°C

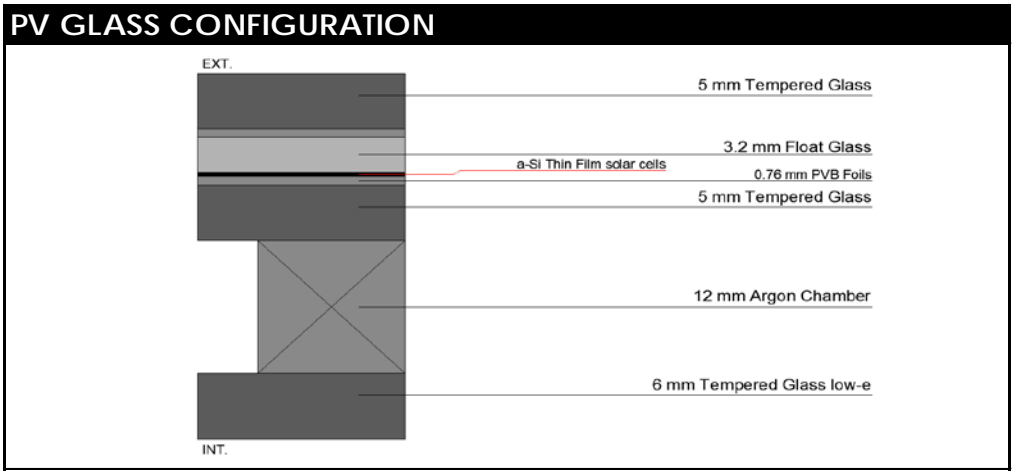
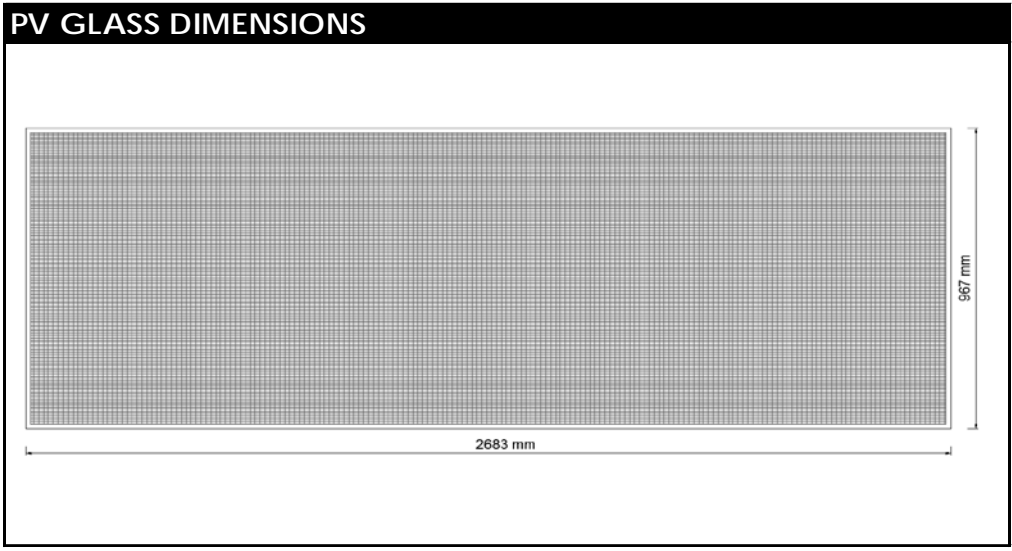
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TECHNICAL DATA - GL.03



GLASS PROPERTIES	Onyx Equivalent Glass
Solar Factor/SHGC	17%
Light Transmission	30%
UV Transmission	< 1%
Light Reflection	8%
U-value [W/sqm.K]	1,2
Peak Power [Wp/sqm]	28,0

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ANNEX 2

COST RECOVERY INCENTIVES

General note:

The aforementioned incentive information has been obtained from several official sources. Onyx Solar recommends all its customers to review the information from these sources, since it may change. Onyx Solar does not guarantee its customers the eligibility to these incentives, since different requirements may apply and/or change. Onyx Solar recommends its customers to contact the organizations granting them, for detailed and updated information about the incentives.

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COST RECOVERY INCENTIVES

		(€)	(€/sqm)
■ ONYX SOLAR PHOTOVOLTAIC GLASS QUOTATION:			
	57 sqm	24.432 €	428,10
<u>Investment Tax Allowar</u>	25% from Onyx Solar Quotation	-6.108	-107,02
100% on qualifying capital expenditure incurred within a period of 5 years. This allowance can be set-off against 100% of statutory income for each year of assessment			
<u>Import Duty Tax Exemp</u>	6% from Onyx Solar Quotation	-1.466	-25,69
on equipment used to generate energy from renewable sources not produced locally			
TOTAL AMOUNT IN COST RECOVERY INCENTIVES:		-7.574 €	-132,71
TOTAL INVESTMENT AFTER APPLYING COST RECOVERY INCENTIVES:		16.858 €	295,39

■ FEED IN TARIFF

Energy production; Feed-in Tariff

Hypothesis: tilt=90°; azimuth=0°. Feed-in Tariff applied: 0,0929 Eur/kWh.

■ OTHER INCENTIVES

Check out all programs available nationwide at: www.re-legal.ey

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