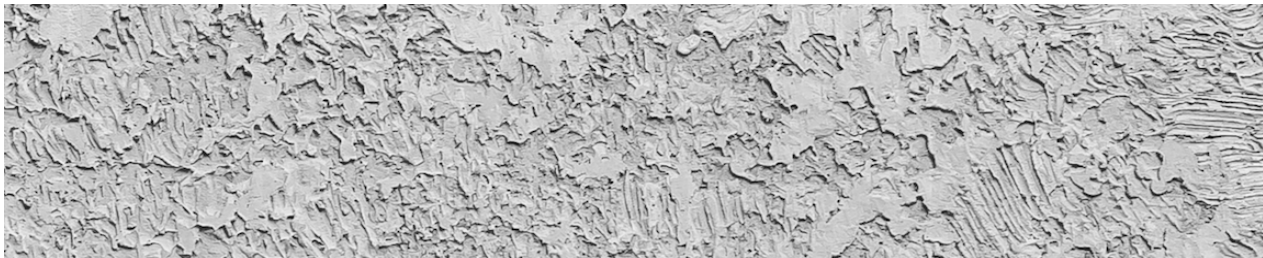
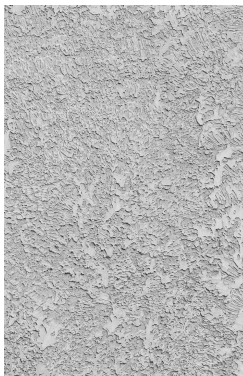
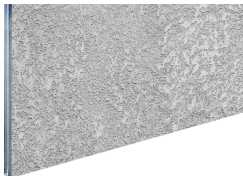
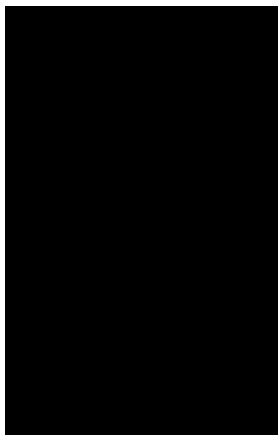
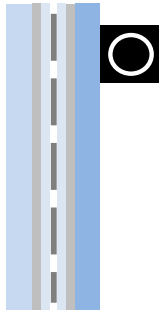
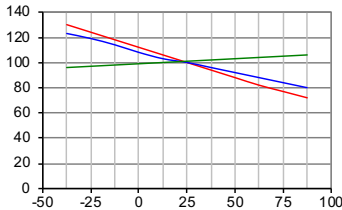
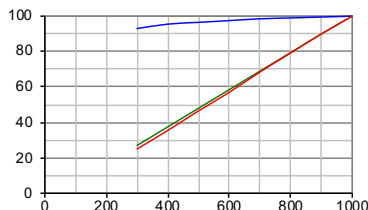
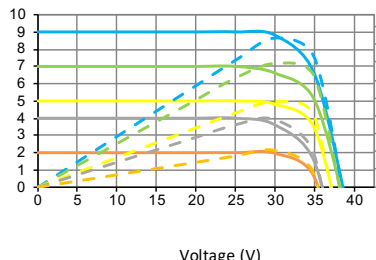
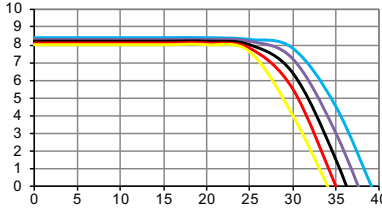


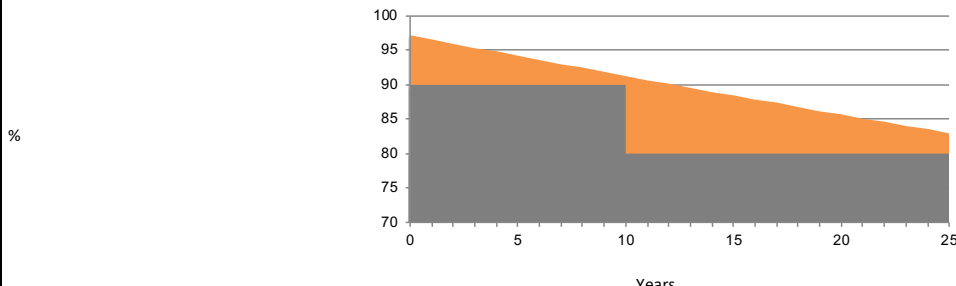
MANUFACTURER			
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PHOTOVOLTAIC MODULES			
Series	BIPV-COLORED-PLASTERED	Reference	BIPV-CL-PL-01-M158-60
		Type	MONOCRYSTALLINE
INTRODUCTION			
			
	MATERIALS	Solar Innova uses the latest materials to manufacture photovoltaic modules.	
	USE	Our modules are ideal for any application that uses the photoelectric effect as a clean energy source because of its minimal chemical pollution and no noise pollution.	
	FRONT	The front of the module contains a tempered solar glass with: ☑ High transmissivity. ☑ Low reflectivity. ☑ Low iron content.	
	PV CELLS	These PV modules use high-efficiency monocrystalline silicon cells (the cells are made of a single crystal of high purity silicon) to transform the energy of sunlight into electric energy. Each cell is electrically rated to optimize the behavior of the module. Its performance is excellent over the entire range of light spectrum, with particularly high yields in low light situations or cloudiness to direct sunlight (diffuse radiation).	
	ENCAPSULANT	The cell circuit is laminated using as encapsulant: ☑ PVB (Polivinil Butiral).	
	BACK	The rear of the module contains a tempered glass which provides complete protection and seals against environmental agents and electrical insulation.	
	JUNCTION BOX	The junction boxes with IP67, are made from high temperature resistant plastics and containing terminals, connection terminals and protection diodes (by-pass). These modules are supplied with symmetric lengths of cable, with a diameter of copper section of 4 mm and an extremely low contact resistance, all designed to achieve the minimum voltage drop losses.	
PERFORMANCE	Our modules comply with all safety requirements not only flexibility but also double insulation and high resistance to UV rays, all are suitable for use in outdoor applications. The design of these modules makes their integration in both industrial and residential buildings (one of the most emerging sectors in the photovoltaic market), and other infrastructure, simple and aesthetic.		
QUALITY CONTROL	We have quality control divided into three elements: ☑ Regular inspections allow us to guarantee the quality of the raw material. ☑ Quality control in the process of our manufacturing procedures. ☑ Quality control of finished products, we conduct through inspections and tests of reliability and performance.		
WARRANTIES	Our manufacturing plants have been prepared in accordance with: ☑ ISO 9001, in terms of Quality Systems and Business. ☑ ISO 14001, in terms of Environmental Management Systems. ☑ ISO 45001, in terms of Management Systems Health and Safety.		
CERTIFICATES	Our PV modules are certified by internationally recognized laboratories and are proof of our strict adherence to international safety standards, long term performance and overall quality of products.		
			

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PHOTOVOLTAIC MODULES									
Series	BIPV-COLORED-PLASTERED				Reference	BIPV-CL-PL-01-M158-60		Type	MONOCRYSTALLINE
PV CELLS									
ELECTRICAL CHARACTERISTICS									
Type	Monofacial				sc-Si				
MECHANICAL CHARACTERISTICS					TEMPERATURE COEFFICIENTS				
Size	mm	158,75 x 158,75 ±0,5			Tk Voltage	%/K	-0,36		
Thickness	µm	210 ±20			Tk Current	%/K	0,07		
Front	[-]	Si3N4 anti-reflection coating			Tk Power	%/K	-0,38		
Back	[+]	Aluminum back surface field (Al-BSF)							
PV MODULES									
ELECTRICAL CHARACTERISTICS									
STC CONDITIONS									
Maximum power	[Pmpp]	Wp				179	±3% (*)		
Power selection	[Pmpp]	%				±3			
Voltage at maximum power	[Vmpp]	V				34,44	IEC 60904-1		
Current at maximum power	[Impp]	A				5,20	IEC 60904-3		
Open circuit voltage	[Voc]	V				40,64	±3% (*)		
Short circuit current	[Isc]	A				5,51	±4% (*)		
Maximum system voltage	[Vsyst]	V				1500 / 1000	IEC / UL		
Maximum series fuse rating	[Icf]	A				15			
Efficiency	[ηm]	%				10,03			
Form Factor	[FF]	%				79,95			
STC (Standard Test Conditions):					Irradiance: 1000 W/m2 + Cell Temperature: 25º C + Air Mass: 1.5				
					* (Considering LID, the power range of the certification authority)				
NMOT CONDITIONS									
Maximum power	[Pmpp]	Wp				132	IEC 61215		
Voltage at maximum power	[Vmpp]	V				31,36			
Current at maximum power	[Impp]	A				4,22			
Open circuit voltage	[Voc]	V				37,14			
Short circuit current	[Isc]	A				4,47			
NMOT (Nominal Module Operating Temperature):					Irradiance: 800 W/m2 + Ambient Temperature: 20º C + Air Mass: 1.5 + Wind Speed: 1 m/s				
MECHANICAL CHARACTERISTICS									
PANEL	WIDTH (X)		HIGH (Y)		DIAGONAL		AREA	POWER/AREA	
Size - Glass-1	1050	x	1700	mm			1,79 m2	100 Wp/m2	
Size - Glass-2	1050	x	1700	mm			1,79 m2		
CELLS									
Size	158,75	x	158,75	mm	210 mm		0,03 m2		
Distance - Top			47	mm					
Distance - between Cells	2	x	2	mm					
Distance - Left	44	mm							
Distance - Right	44	mm							
Distance - Bottom			47	mm					
Quantity	6	x	10	=	60 units		1,51 m2		
COMPONENTS									
MATERIAL	QUANTITY	THICKNESS (Z)	DESCRIPTION	DENSITY	TOTAL WEIGHT	THERMAL RESISTANCE			
Glass-1	1 units	4 mm	FTG-UClear	10,12 kg/m2	18,07 kg	0,1738 m2K/W			
Sheet Encapsulant	1 units	0,76 mm	PVB	0,81 kg/m2	1,44 kg	0,0032 m2K/W			
Busbars	5 units	0,2 mm	SnAgCu	0,10 kg/m2	0,15 kg				
PV Cells	60 units	0,21 mm	sc-Si	0,20 kg/m2	0,30 kg				
Sheet Encapsulant	1 units	0,76 mm	PVB	0,81 kg/m2	1,44 kg	0,0032 m2K/W			
Backsheet	1 units	0,5 mm	TPT-RAL 9005	0,47 kg/m2	0,84 kg	0,0032 m2K/W			
Glass-2	1 units	4 mm	FTG	10,12 kg/m2	18,07 kg	0,1738 m2K/W			
Junction Box	1 units	10 mm	PVC-IP68	0,10 kg/m2	0,10 kg				
Diodes (By-pass)	5 units			0,01 kg/m2	0,02 kg				
Cables (+/-)	2 units	4 mm2	900 mm	0,10 kg/m2	0,20 kg				
Connectors	2 units	MC4-T4 type	PVC-IP67	0,05 kg/m2	0,10 kg				
TOTAL		10,23 mm		26,94 kg/m2	40,74 kg	0,36 m2K/W			
THERMAL CHARACTERISTICS									
TEMPERATURE COEFFICIENTS					MONOCRYSTALLINE				
Temperature coefficient of short circuit current	α	[Isc]			0,0814	% / º C			
Temperature coefficient of open circuit voltage	β	[Voc]			-0,3910	% / º C			
Temperature coefficient of maximum power	γ	[Pmpp]			-0,5141	% / º C			
Temperature coefficient of current at maximum power		[Impp]			0,1000	% / º C			
Temperature coefficient of voltage at maximum power		[Vmpp]			-0,3800	% / º C			
Nominal Module Operating Temperature		[NMOT]			+ 47 ± 2	º C			
THERMAL TRANSMITTANCE (U)					SOLAR HEAT GAIN COEFFICIENT (G)				
Ug-Value	2,80 W/m2 K	EN 673		G-Value	0,36 %	EN 410			
UV TRANSMITTANCE					ACOUSTIC INSULATION (R)				
UV-Value	0,00 %	300-380 nm	EN 410	R-Value	32(-1;-3)	EN 12758			
VISIBLE LIGHT TRANSMISSION (LT)									
LT-Value	0,00 %	380-780 nm	EN 410	Opacity	100,00 %	CIE D65	ISO 9050		
EXTERIOR REFLECTION (LRe)					INTERIOR REFLECTION (LRI)				
LRe-Value	8,00 %	EN 410		LRI-Value	15,00 %	EN 410			
TOLERANCES									
Working temperature	- 40 / + 85 ºC		Glass dimension	< ± 2,5 mm			EN 12543-5		
Dielectric isolation voltage	3000 V		Glass symmetrytolerance	< ± 3 mm			EN 12543-5		
Relative humidity	0 / 100 %		Cell single string distolerance	< ± 1 mm			EN 12543-6		
Wind resistance	15345 Pa	1565 kg/m2					IEC 61215		
Snow resistance	15345 Pa	1565 kg/m2	Maximum hail resistance	Ø 25			23 m/s	IEC 61215	
Conductivity at ground	≤ 0.1 Ω		Resistance	≥ 100 Ω					
CLASSIFICATIONS									
Application class	A Class	IEC 61730	Pollution	Degree	1	IEC 61730			
Electrical protection class	II Class	IEC 61140 IEC 61730	Material	Group	I	IEC 61730			
Fire safety class	A Class	ANSI/UL 790 IEC 61730	Safety	Factors	1.5	IEC 61730			
LAMINATED GLASS (EN 14449)									
Impact resistance	1B1 Class	EN 12600	High temperature	OK			EN 12543-4		
Manual attack	P2A Class	EN 356	Humidity	OK			EN 12543-4		
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QR CODE					
PHOTOVOLTAIC MODULES					
Series	BIPV-COLORED-PLASTERED		Reference	BIPV-CL-PL-01-M158-60	
			Type	MONOCRYSTALLINE	
DRAWING					
JUNCTION BOX					
Position	Front	-	Rear	■	Axis (X)
					Axis (Y)
PANEL					
FRONT		REAR		SECTION	
					
		WIDTH (X)		1050	mm
		THICKNESS (Z)		10,23	mm
PERFORMANCE					
CELLS					
TEMPERATURE			IRRADIANCE		
Temperature depending on Isc, Voc and Pmax			Irradiance depending on Isc, Voc and Pmax (cell temperature: 25° C)		
					
Cell temperature (° C)			Irradiance (W/m2)		
--- Pmax --- Voc --- Isc			--- Voc --- Isc --- Pmax		
PANELS					
TEMPERATURE			IV-IRRADIANCE		
Electrical performance (cell temperature: 25° C)					
					
Voltage (V)			Voltage (V)		
--- I-V 1000 W/m2 --- P-I 1000 W/m2			I-V (-25°C) I-V (0°C) I-V (+25°C) I-V (+50°C) I-V (+75°C)		
--- I-V 800 W/m2 --- P-I 800 W/m2					
--- I-V 600 W/m2 --- P-I 600 W/m2					
--- I-V 400 W/m2 --- P-I 400 W/m2					
--- I-V 200 W/m2 --- P-I 200 W/m2					
SOLAR SIMULATOR					
Class	AAA	IEC 60904-9	Power measurement uncertainty is	± 3 %	
ELECTRICAL MEASURES					
STC CONDITIONS			NMOT CONDITIONS		
Irradiance	1000 W/m2	IEC 60904-1	Irradiance	800 W/m2	IEC 61215
Cell temperature	25 °C	IEC 60904-3	Ambient temperature	20 °C	
Air Mass	1,5	ASTM G173	Air Mass	1,5	ASTM G173-03
		ASTM 1036	Wind speed	1 m/s	
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PHOTOVOLTAIC MODULES					
Series	BIPV-COLORED-PLASTERED		Reference	BIPV-CL-PL-01-M158-60	
			Type	MONOCRYSTALLINE	
STANDARD GUARANTEES					
LINEAR PERFORMANCE WARRANTY					
					
Manufacturing defects	12 years.				
Performance	90 %	of rated power after		12	years of operation,
	80 %	of rated power after		25	years of operation.
Lifespan	> 30 years.				
ENVIRONMENTAL INFORMATION					
Solar Hours Peak	6 day		kWh	Coal	Petrol/Gas Combined
Irradiation rate	1000 W/ m2			1	0,961 0,828 0,372 kg/CO2
Energy generated	1,07 kWh/ day		Avoided	day	1,03 0,89 0,40 kg/CO2
	32 kWh/ month		CO2	month	30,98 26,70 11,99 kg/CO2
	392 kWh/ year		emissions	year	376,96 324,79 145,92 kg/CO2
CERTIFICATES					
ISO 9001	Quality management systems.				
ISO 14001	Environmental management systems.				
ISO 45001	Occupational health and safety management systems.				
CE	Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.				
IEC/EN 61215	Crystalline silicon terrestrial photovoltaic (PV) modules. Design qualification and type approval.				
IEC/EN 61730-1	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction.				
IEC/EN 61730-2	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing.				
IEC 63092-1	Photovoltaics in buildings - Part 1: Requirements for building-integrated photovoltaic modules.				
UL 1703	Standard for Flat-Plate Photovoltaic Modules and Panels.				
EN 13501	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.				
EN 14449	Glass in building - Laminated glass and laminated safety glass - Evaluation of conformity/Product standard.				
EN 12543	Glass in building - Laminated glass and laminated safety glass.				
EN 12600	Glass in building - Pendulum test - Impact test method and classification for flat glass.				
EN 50583	Photovoltaics in buildings - Part 1: BIPV modules.				
      					
PACKING					
CONTAINER 20'			CONTAINER 40'HQ		
PANELS X PALLET	PALLETS	TOTAL	PANELS X PALLET	PALLETS	TOTAL
-	-	-	26	22	572
IEC 62759-1	Photovoltaic (PV) modules - Transportation testing - Part 1: Transportation and shipping of module package units.				
EXPORT INFORMATION					
HS Code	85.41.43.00		TARIC code	85.41.43.00	
REGISTER OF ELECTRICAL AND ELECTRONIC EQUIPMENT PRODUCERS					
WEEE	7378		Entity	ECOASIMELEC	
DESCRIPTION					
Silicon cell photovoltaic solar module sc-Si, BIPV-Colored-Plastered series, for architectural integration, from the manufacturer SOLAR INNOVA, maximum power (Wp) 179 W, voltage at maximum power (Vmp) 34,44 V, current at maximum power (Imp) 5,20 A, open-circuit voltage (Voc) 40,64 V, short-circuit current (Isc) 5,51 A, efficiency 10,03 %, composed of 60 cells, front layer tempered glass thick 4 mm, encapsulant layers of cells of PVB, back layer of tempered glass thick 4 mm, junction box (diodes, cables 4 mm2, 900 mm and connectors MC4-T4), working temperature - 40 / + 85 °C, dimensions 1050 x 1700 x 10,23 mm, maximum wind load 15345 Pa, maximum snow load 15345 Pa, weight 40,74 kg.					
COMMENTS					
NOTICE					
The specifications and technical data may be subject to possible modifications without notice.					
This data sheet are conform to the requirements of the Standard EN 50380.					
Images for ilustration purposes only.					
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