



Lumiduct™

ACTIVATE YOUR FAÇADE



Wellsun embraces the sun
to make building environments more
liveable and energy efficient

People love the sun. That is why we love glass buildings with their transparency and the abundance of daylight.

But our lovely sun also creates heat and glare in the buildings where we live and work. Instead of making good use of the energy of the sun, we lose a lot of energy to keep the sun under control. And that is a waste.

But not with Wellsun. Wellsun embraces the sun.
Wellsun uses all the sun has to offer in the most effective way.

With Wellsun, nothing from the sun goes to waste.



LUMIDUCT ACTIVATES YOUR FAÇADE

The Lumiduct from Wellsun is an elegant solution for making buildings more sustainable and livable. Buildings with the Lumiduct come to life.

During the day, the façade is activated by brilliant transparent solar panels, enabling the building to generate and save energy. At night, the façade is activated by using integrated LEDs creating a beautiful atmosphere and making it possible to communicate with the surroundings. The Lumiduct generates awareness of the dedication to sustainability and makes living in buildings a unique and comfortable experience.

The Lumiduct captures the sun and make optimal use of its energy. With the Lumiduct, only the light we need enters the building, while the light we do not need, is turned into electricity.

CIRCULAR SOLAR PANEL

The Lumiduct is perfect for circular design because the panels are easy to re-use and fully recyclable.

Because the sunlight is concentrated on very small solar cells only 1 m² of PV material is needed for 500 m² of façade.

Because of the high watt peak rating, the Lumiduct improves energy labels, like EPC, significantly.

Because of the low material shadow costs and the high EPC score, the Lumiduct creates a significant higher BREAAAM score than alternative solar panels.





Lumiduct™ - basic

GENERATE

REGULATE



Lumiduct™ - media

GENERATE

REGULATE

COMMUNICATE

BENEFITS

1 GENERATE



Most efficient
solar panels in
the world

 wellsun



Unique transparent
shading allows up
to 3 times more
daylight to enter



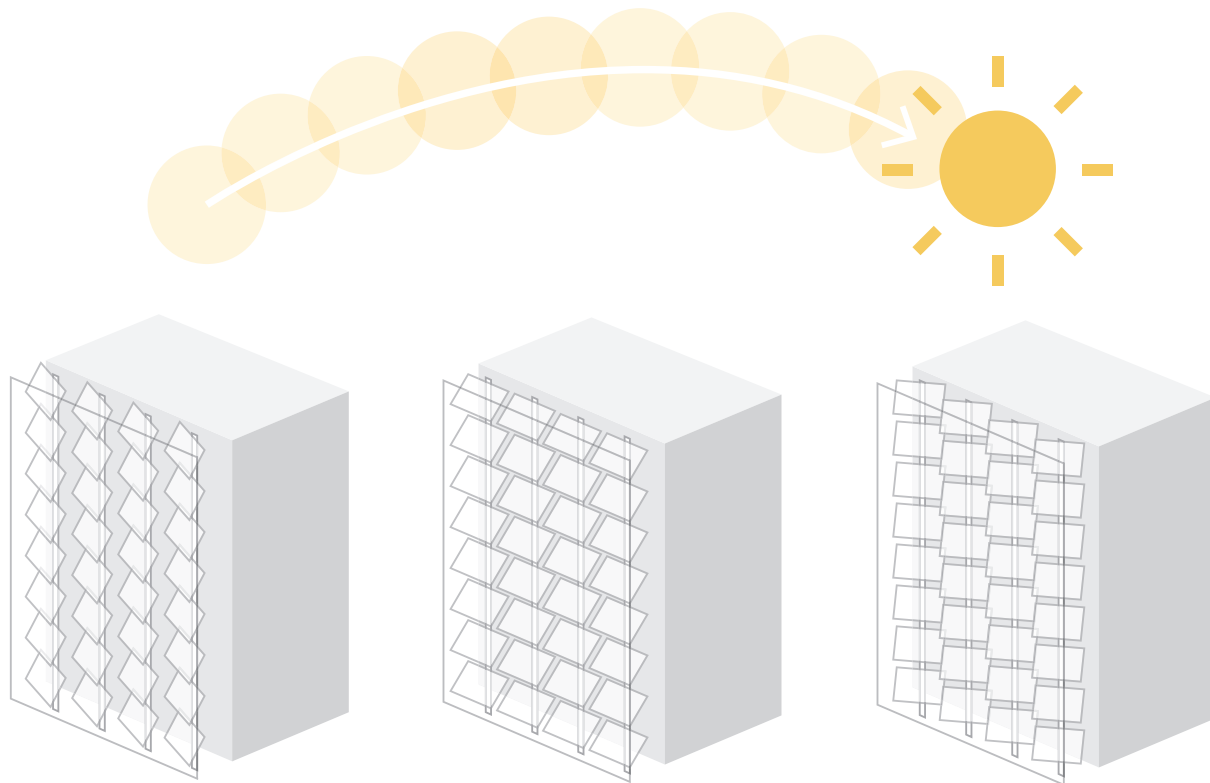
Powerful
communication
with an integrated
LED media display

3 COMMUNICATE

 wellsun

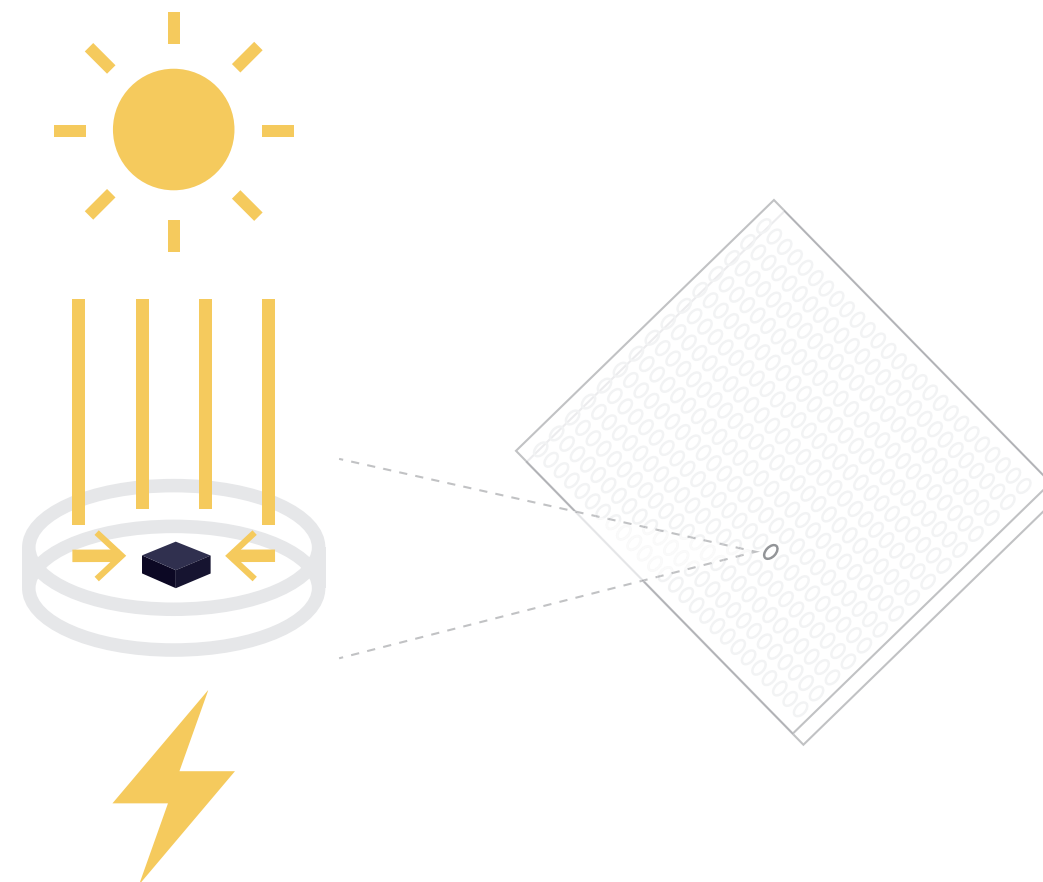
HOW IT WORKS

1 PANELS AUTOMATICALLY TRACK THE SUN



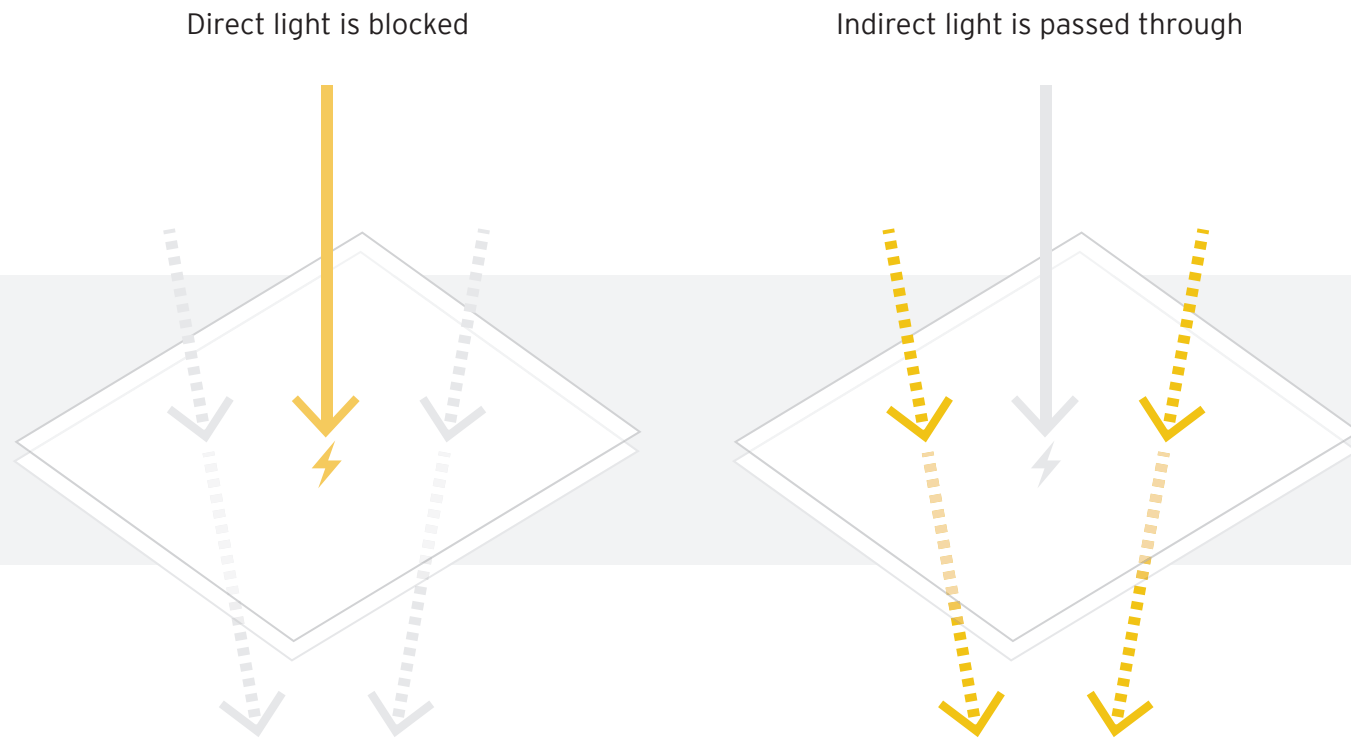
- > Directs the panels towards the sun to enable energy production and daylight control
- > Movement of the panels is unnoticeable
- > Highest unobstructed view to the outside of all shading systems
- > Energy consumption required for tracking is < 1% of the power generated

2 SOLAR ENERGY IS PRODUCED



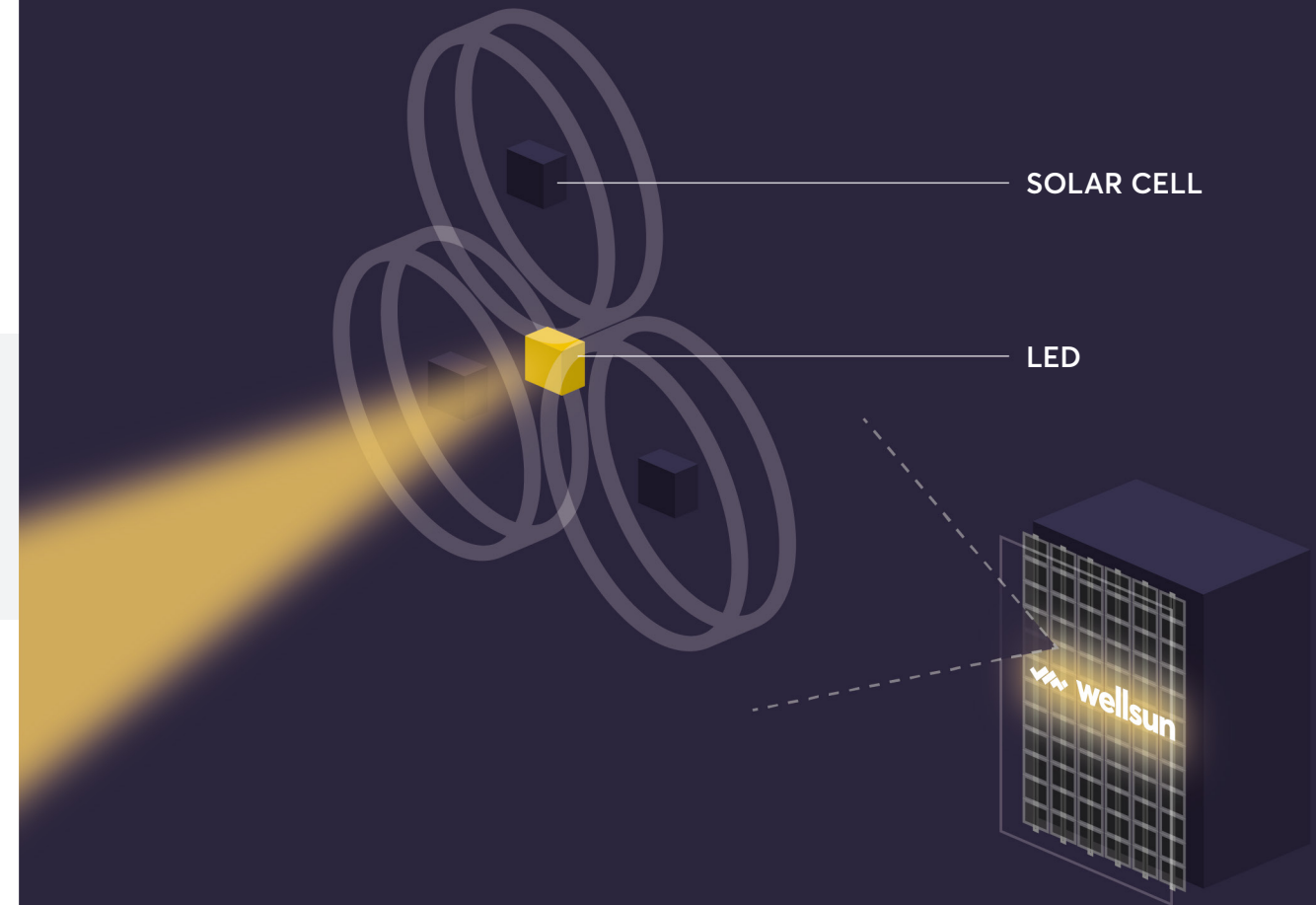
- > Panel efficiency is 30%
- > Peak power is 300 Wp/m² (under Standard Test Conditions)
- > Heat is blocked and can be harvested

3 DAYLIGHT IS CONTROLLED



- > Transmits diffused daylight which naturally lights the interior
- > Blocks direct sunlight to prevent glare and overheating

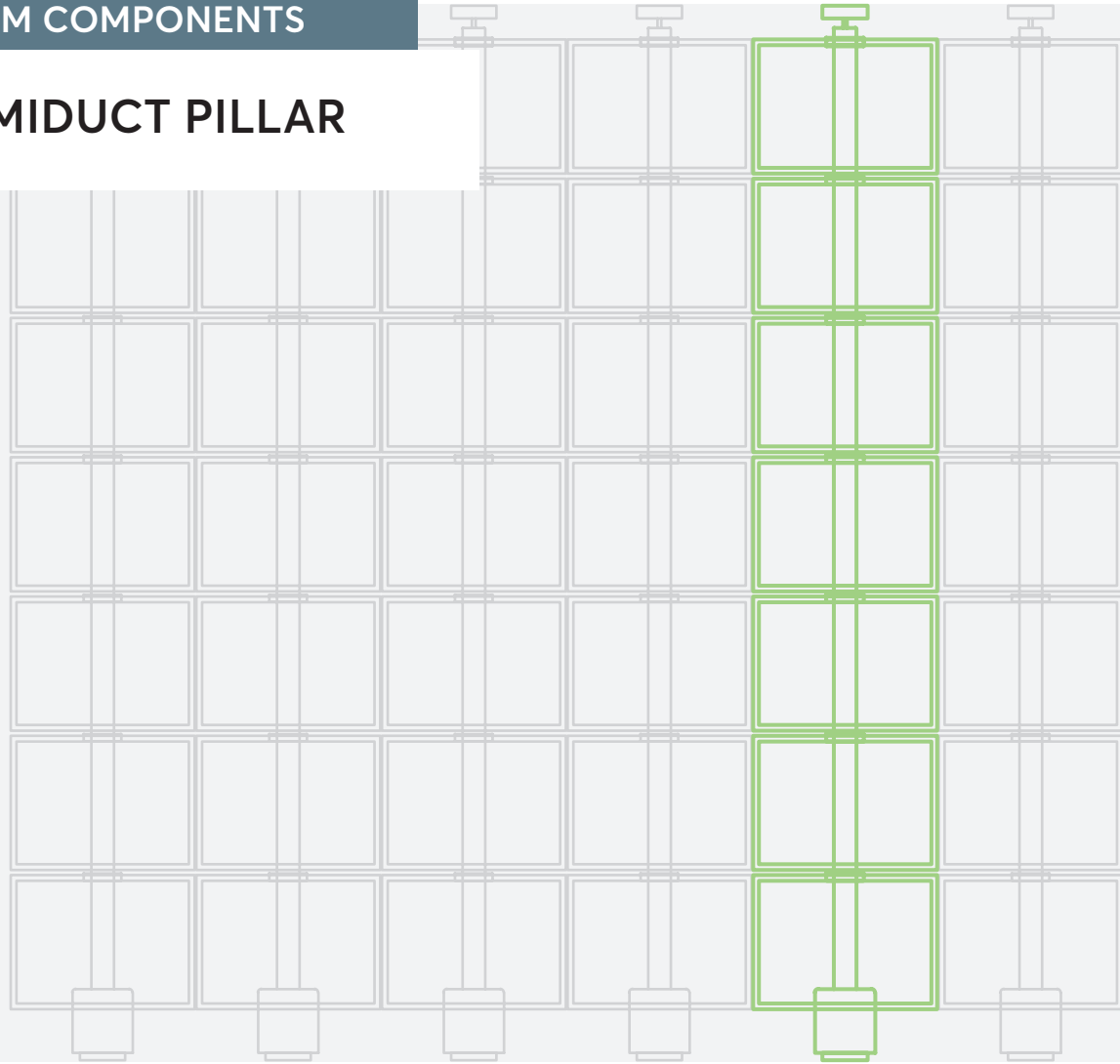
4 FAÇADE BECOMES MEDIA-WALL



- > Available with Lumiduct Media only
- > Up to 100% of the façade surface area can be used as media-wall
- > Pixel pitch is 23mm

SYSTEM COMPONENTS

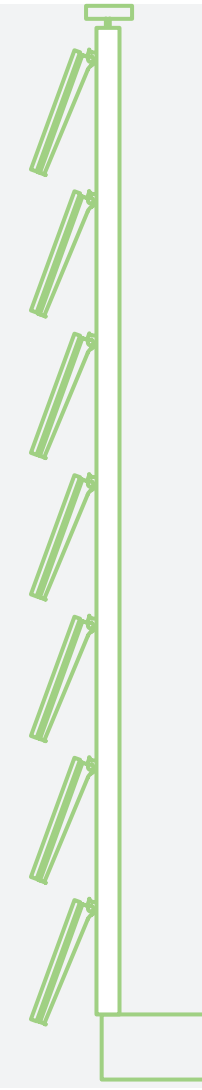
1 LUMIDUCT PILLAR



- > Number of panels per pillar can vary from 1 to 7
- > Standard pillar height up to 3.60m
- > Standard panel size is 600x426mm
- > Slim panel design of only 14mm thin
- > Project specific customization is possible

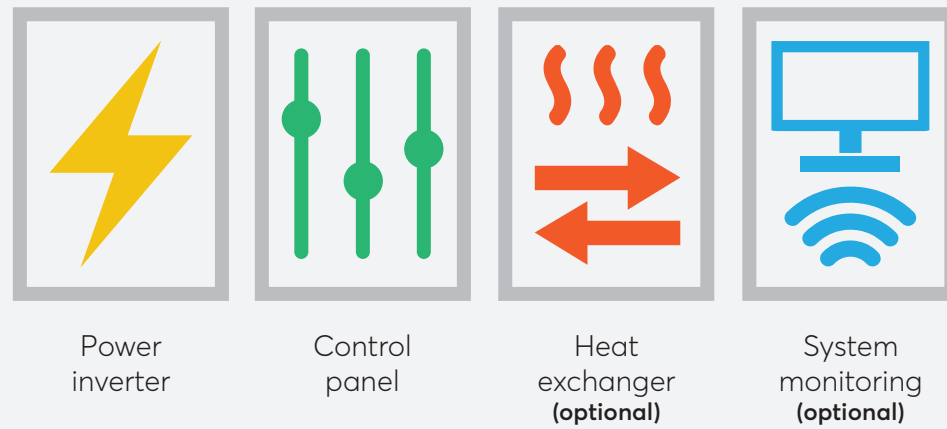


2 DOUBLE-SKIN FAÇADE



- > Climate façade for improved energy performance
- > Heat buffer for improved indoor climate
- > Sound barrier in case of noisy environments
- > Façade depth is 1m

3 SYSTEM MANAGEMENT



- > Power inverter attached to AC grid
- > Control panel for preferred operation mode for client
- > Optional heat exchanger to increase energy efficiency
- > Optional (remote) system monitoring
- > System can be connected to building management system

4 SCALABLE GRID



- > Modular design allows for complete scalability
- > Up to 100% coverage of any façade

Lumiduct system properties

ENERGY GENERATION	Peak electrical power ^[1]	W/m²	300
	Yearly electrical energy yield ^[2,3]	kWh/m²/year	60
	Peak heat generation ^[4]	W/m²	363
	Yearly heat generation	kWh/m²/year	105
DAYLIGHT PROPERTIES	Direct light (glare) blockage	%	99
	Diffuse light transmission	%	70

Lumiduct module properties

POWER GENERATION	Pmpp ^[5]	W	69
	Vmpp	V	42
	Impp	A	1.6
	Voc	V	47
	Isc	A	1.7
	Fill factor		0.87
	Efficiency ^[6]	%	30
MECHANICAL PROPERTIES	Dimensions (LxWxH)	mm	600 x 426 x 14
	Receivers per coupon	#	540
	Receiver dimensions (hexagonal diagonal)	mm	23

^[1] Based on standardized test conditions: 1000 W/m2 irradiation. AM1.5 Spectrum

^[2] 85% Transmission through outer glass facade included.

^[3] Based on yearly energy yield simulations for a system located in Amsterdam, due south orientation.

^[4] Using heat pump or air/water heat exchanger.

^[5] Based on preliminary specifications provided by Morgan Solar

^[6] Aperture efficiency

Lumiduct facade properties

MECHANICAL PROPERTIES	Coupons per pillar	#	up to 7
	Azimuth tracking range	degrees °	0 - 180
	Elevation tracking range	degrees °	0 - 90
CONTROL ELECTRONICS	Input voltage	Vdc	48
POWER ELECTRONICS	Optimizer output voltage	Vdc	700

Lumiduct performance comparison

		Units	Lumiduct	Energy producing window ^[7]	Glass/silicon PV combi (70%) ^[8]	Automated horizontal blinds ^[9]
ENERGY GENERATION	Peak electrical power ^[10]	W/m²	300	8.4	133	0
	Yearly electrical energy yield	kWh/m²/year	60 ^[11,12]	3.8 ^[13]	60 ^[13]	0
	Peak heat generation ^[14]	W/m²	363	0	0	0
	Yearly heat generation	kWh/m²/year	105	0	0	0
OPTICAL PROPERTIES & COMFORT	Direct light (glare) blockage	%	99	-	70	100
	Diffuse light transmission	%	70	-	24	10
	Unobstructed view factor ^[15]	%	42	100	30	32
	Response time to change in daylight intensity	min	0	passive ^[16]	passive ^[16]	up to 15
	Fluctuation in average in-door light level when the sky conditions go from overcast to sunny ^[17]	10³ lux	0.6	1.9	1.9	3.2

^[7] Transparent photovoltaic film/coating applied on the glass. Window transparency close to 100%.

^[8] Mono-crystalline Silicon PV cells cover 70% of the glass surface

^[9] Lowered and raised depending on outdoor light intensity, adjusted every 2 hours

^[10] Based on standardized test conditions: 1000 W/m² irradiation. AM1.5 Spectrum

^[11] 85% Transmission through outer glass facade included

^[12] Based on yearly energy yield simulations for a system located in Amsterdam, due south orientation

^[13] Peak electrical power (Wp) * solar power generation factor in the Netherlands (0.8 kWh/Wp) * correction factor for a vertical plane, due south orientation (0.8)

^[14] Using heat pump or air/water heat exchanger

^[15] Yearly average for active systems

^[16] The system has no active components and is hence unable to respond to changes

^[17] Calculation based on light transmission properties and unobstructed view factor.
Direct sunlight intensity: 70.000 lux. Indirect intensity full sun: 20.000 lux. Indirect intensity overcast: 12.000 lux.

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Benefits and pricing are project dependent. Contact us for a tailor-made proposal.

