



Suncol S.r.l.
P.IVA: IT 03968210132
Via S. Maurizio, 66
22036 Erba (CO) Italy

Export Manager:
Linda Saccani
sales@suncol.com
+39 335 6039017

Find out more:
www.suncol.com
suncol@suncol.com

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Suncol Facade

Cover the entire building
facade without aesthetic
or structural limits.

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Suncol Facade

From the infinite permutation of colors, dimensions and finishes, freely create your energy facade.

Suncol Facade allows you to design any energy building without aesthetic or size constraints, guaranteeing great design freedom combined with very high energy efficiency. Each module can be combined with others and treated with different finishes and collections.



Free Dimensions:

Max: 2000 x 3000 mm

Min: 200 x 300 mm



36 Colors:

All Material Collections

All Essence Collections



3 Surfaces:

Natural

Cannette

Flat

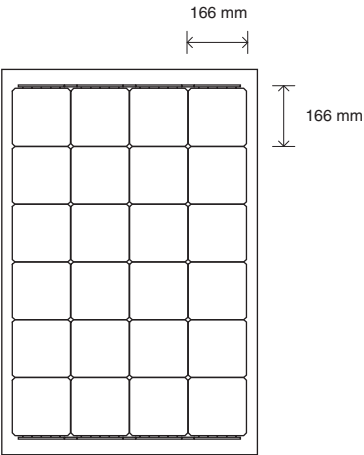
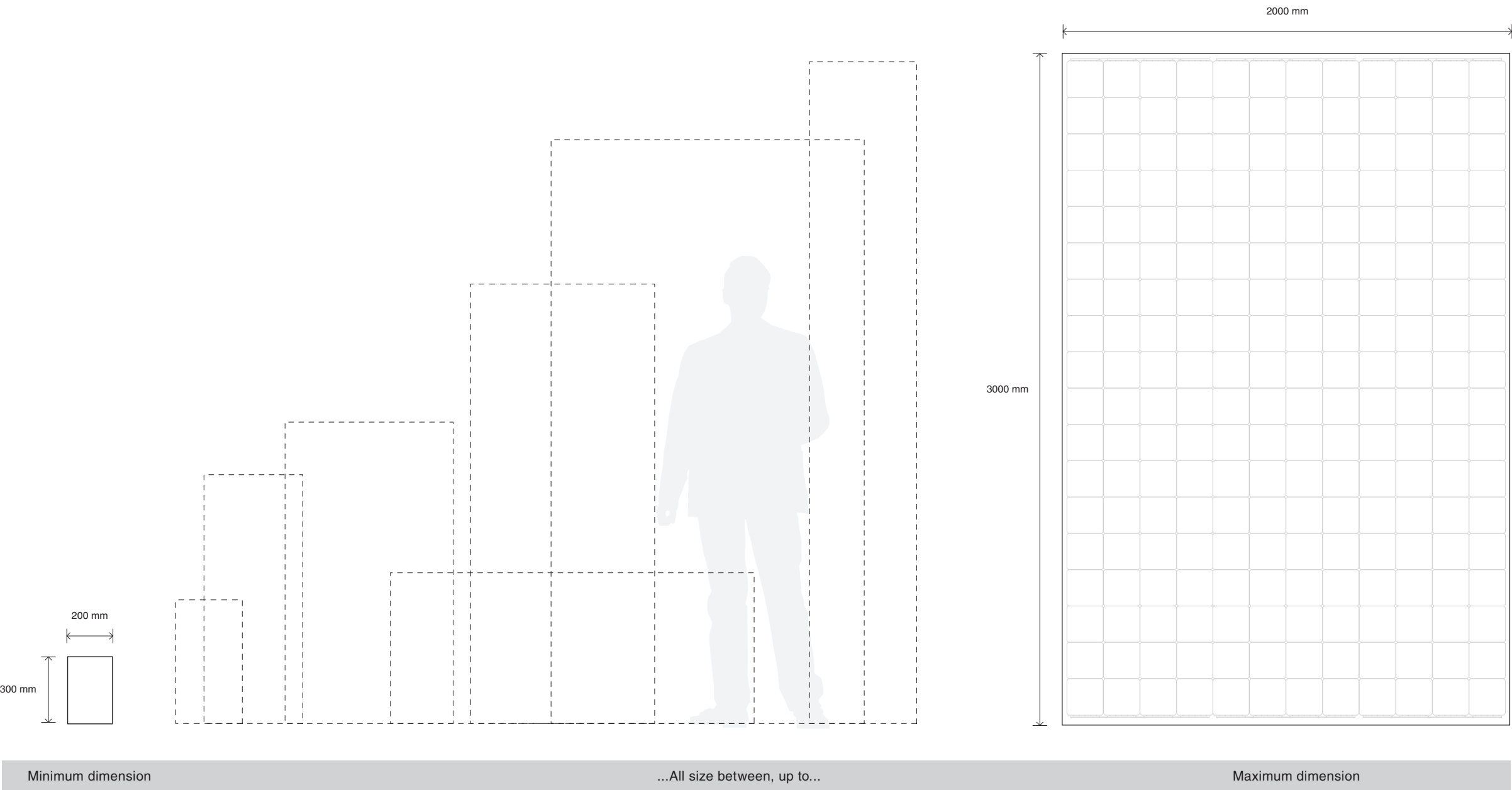


Facade size and dimensions

Suncol Facade is a universal solution and allows maximum compositional and aesthetic freedom (dimensions and finishes).
From micro (200 x 300 mm) to huge slabs (2000 x 3000 mm) Suncol Facade permits to cover all building surface making your facade completely active. You can freely choose all the intermediate sizes to best suit your project needs and cover every facade surface of the building.



Photovoltaic cell
under Suncol surface.
SBC M6
166 x 166 mm



Suncol surface hides high-performance photovoltaic cells inside. Depending on the desired panel size, the number of cells that can be installed varies and consequently the surface efficiency also varies. Ask our experts for more information on how to maximize surface efficiency.

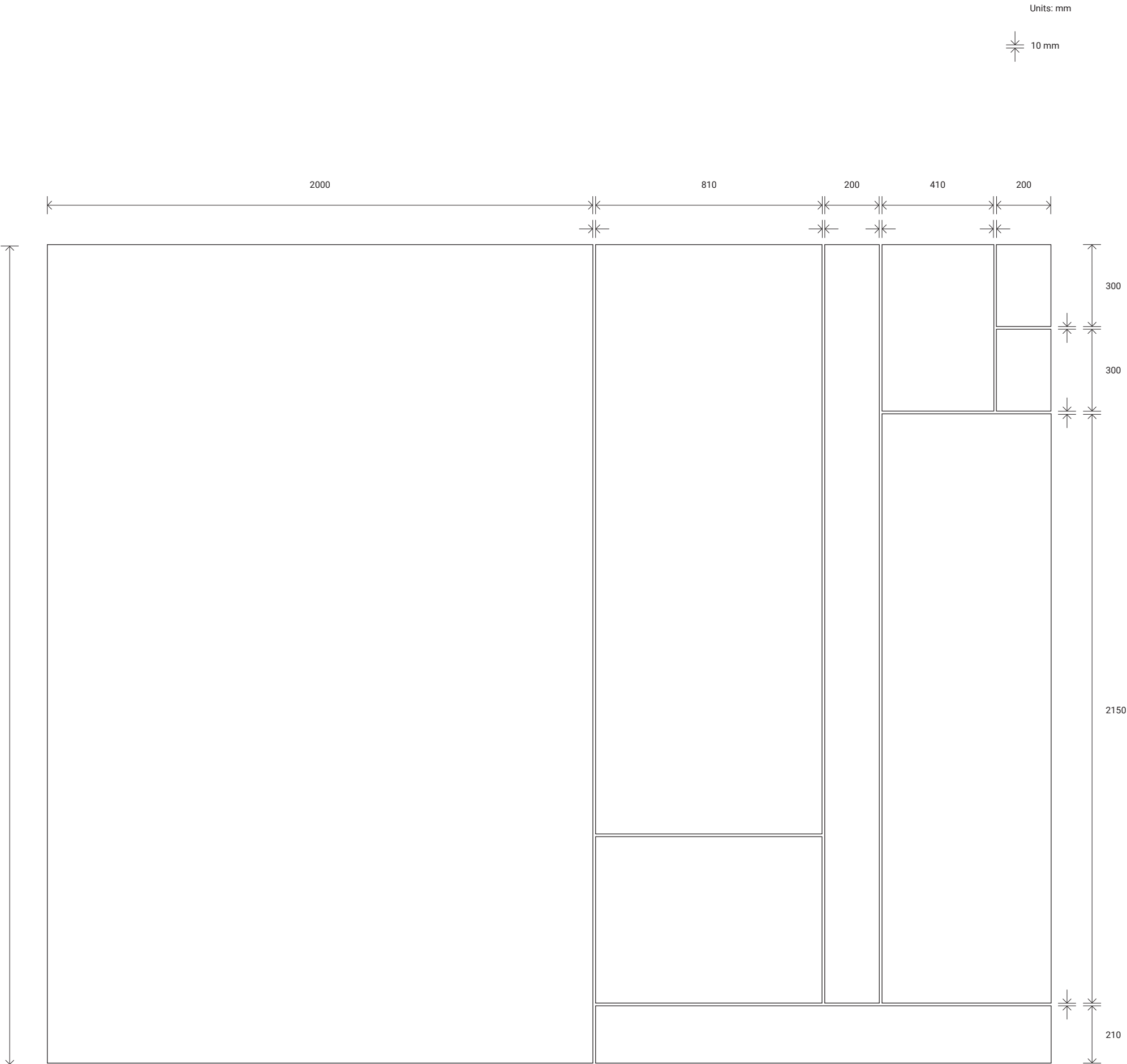
Composition examples

Suncol Facade can be composed in a linear and uniform manner by placing panels of the same size next to each other (the distance between two panels on the facade is 10 mm).

To add dynamism and movement to the building or simply cover smaller areas, the designer can use modules with different dimensions, composing them in the best possible way according to his aesthetic and design needs.

Each Suncol module can be customized in a different way with different collections and surface finishes in order to always have the maximum possible customization.

The panel efficiency varies according to the size and number of cells that can be installed.





Dummy modules

Despite the best expectations, we know that not the entire facade is always exposed to full sun, which is why Suncol also manufactures dummy modules, aesthetically identical to energy active modules but non-active.

The dummy modules are used to complete the entire surface of the house, from roof to the facade, even the smallest or shaded part (such as the attic), maintaining the same aesthetic characteristics of the active modules. Dummy modules allow a saving on the cost of production as they do not have the PV technology. Externally dummy modules are treated with the same collections or finishes as the active modules in order to be aesthetically identical and harmoniously complete the surface.

Dummy modules:

Smallest parts or Shaded parts

Same aesthetic & costs reduction

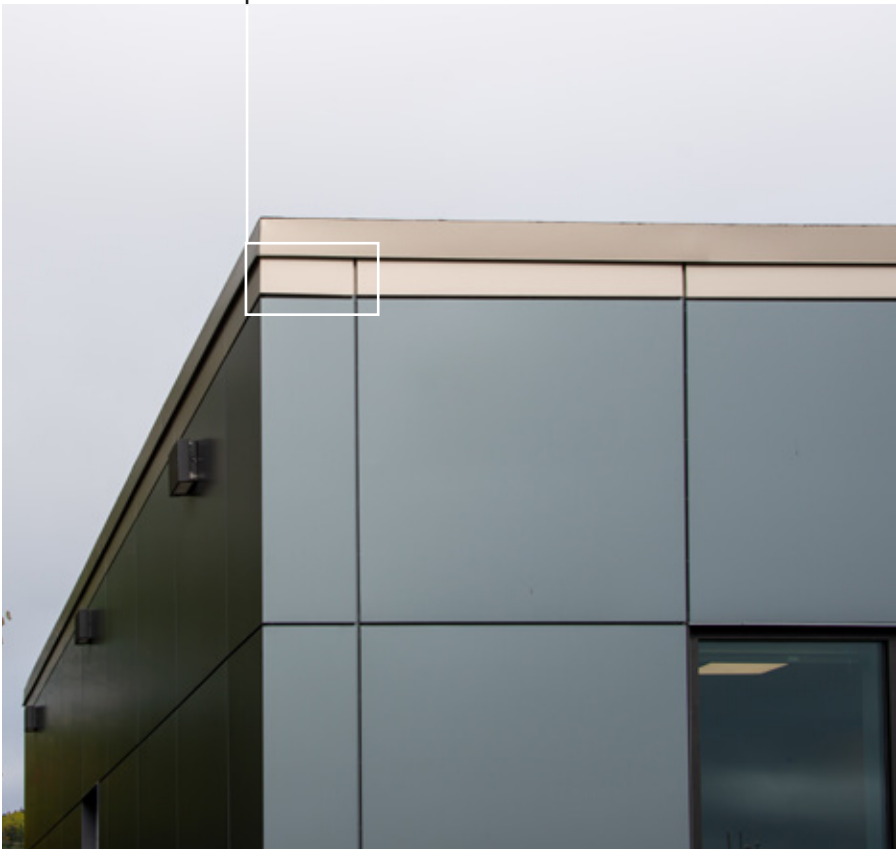
- Suncol Facade/ Active modules
- Dummy Modules / Non active modules



Dummy modules used to cover the shaded parts.



Dummy modules used to cover smallest parts.



Facade collections

Choose between 18 material textures and 18 plain colors to perfectly adapt your project to the urban context. Suncol Facade allows you to express yourself freely with all 36 colors while Puzzle and Tile (at least in the standard version) have a limited selection of colors. Depending on the desired collection, Suncol offers a recommended surface finish capable, as in the case of the material collection, to enhance the grain and textures of the natural world.

Material collection


Metal textures

Calcareous textures

Concrete textures

Stone textures

Granite textures



Suncol uses **completely ecological coloring processes** for all collections.

Essence collection

Brown colors

Blue colors

Green colors

Gray colors

White colors

MATERIAL COLLECTION

Burnished
Cod: MM-07

Metal textures

Bronze
Cod: MM-08

Metal textures

Russet
Cod: MM-05

Metal textures

Corten
Cod: MM-06

Metal textures



Gray
Cod: MC-10

Calcareous textures



Taupe
Cod: MC-12

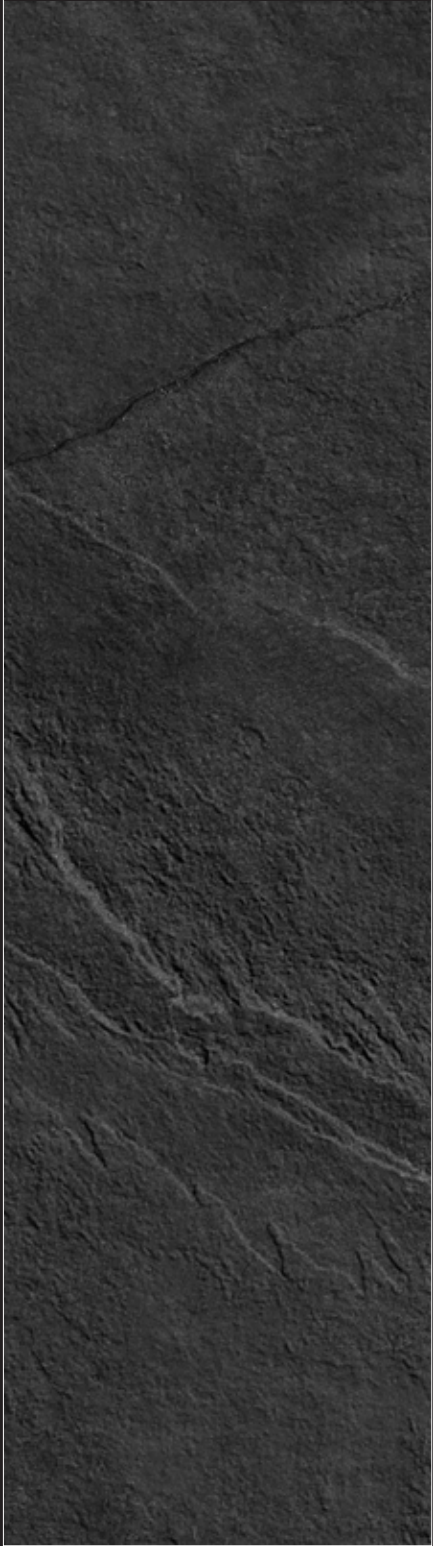
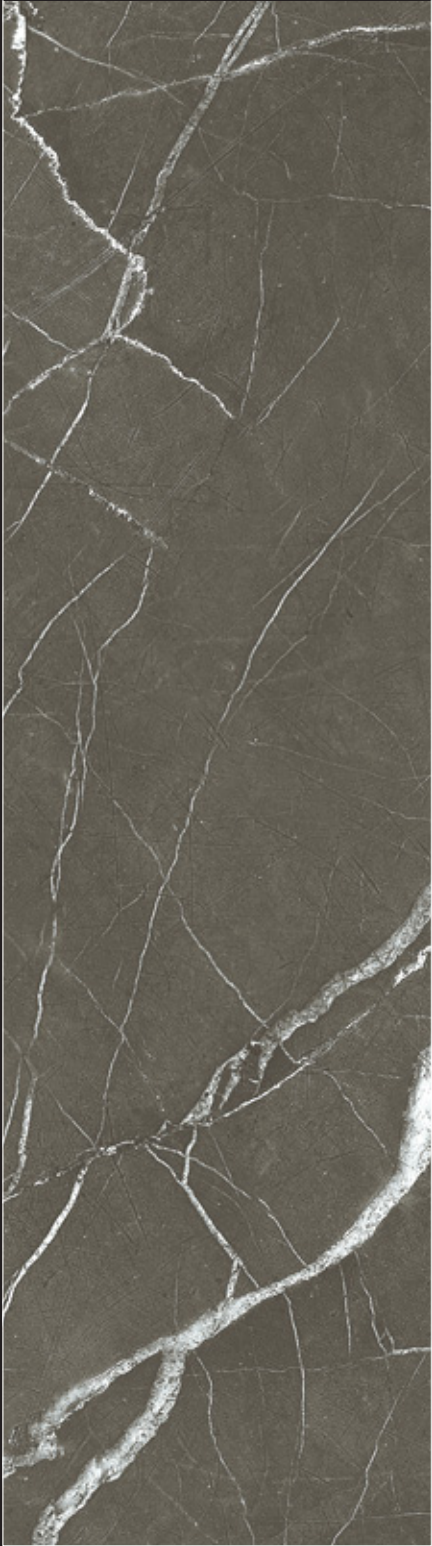
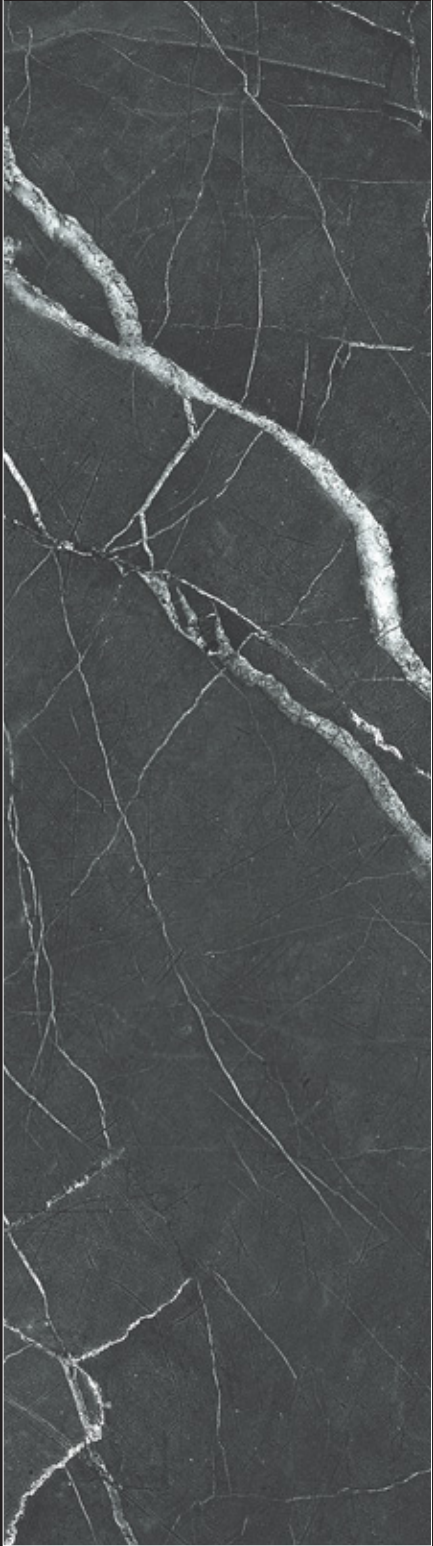

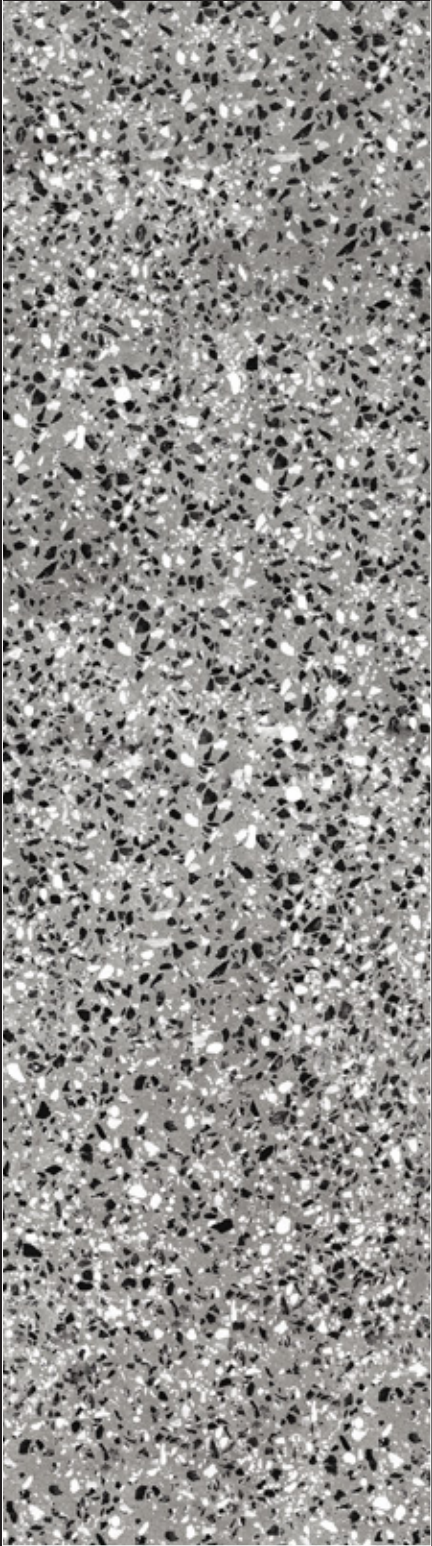
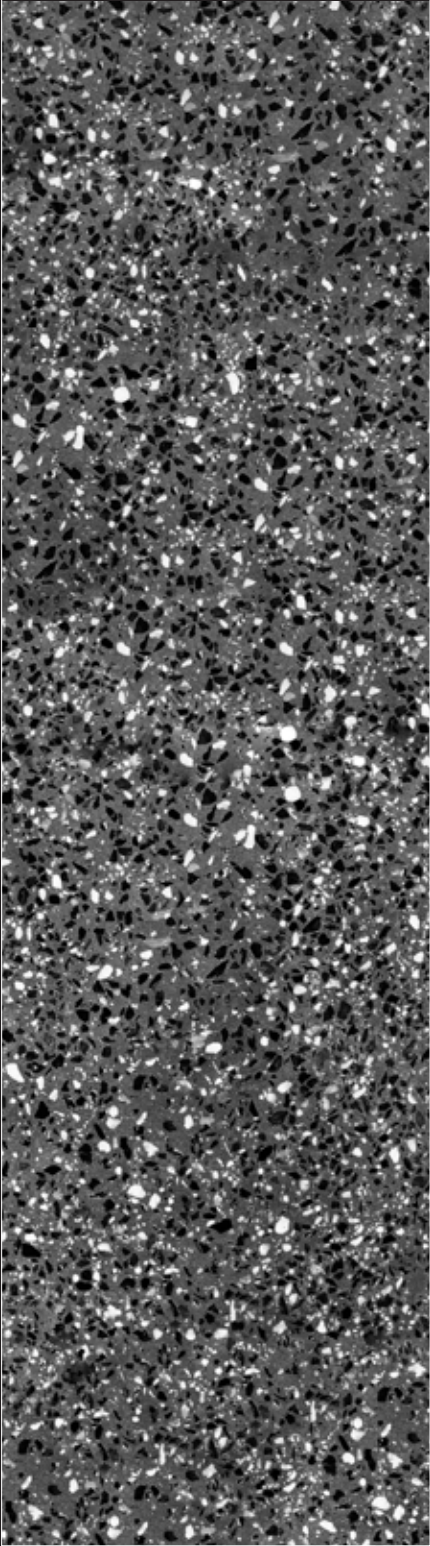
Calcareous textures



MATERIAL COLLECTION

<div>Cream Cod: MC-11</div> <div>Calcareous textures</div> <div></div>	<div>Brown Cod: MC-09</div> <div>Calcareous textures</div> <div></div>	<div>Worn sand Cod: MC-04</div> <div>Concrete textures</div> <div></div>	<div>Used gray Cod: MC-01</div> <div>Concrete textures</div> <div></div>	<div>Vintage taupe Cod: MC-02</div> <div>Concrete textures</div> <div></div>	<div>Worked charcoal Cod: MC-03</div> <div>Concrete textures</div> <div></div>
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MATERIAL COLLECTION

<div><div>Slate Cod: MS-13</div><div>Stone textures</div><div></div></div>	<div><div>Piasentina ocher Cod: MS-16</div><div>Stone textures</div><div></div></div>	<div><div>Piasentina gray Cod: MS-15</div><div>Stone textures</div><div></div></div>	<div><div>Graystone Cod: MS-14</div><div>Stone textures</div><div></div></div>	<div><div>Vintage gray Cod: MG-18</div><div>Granite textures</div><div></div></div>	<div><div>Vintage dark Cod: MG-17</div><div>Granite textures</div><div></div></div>
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ESSENCE COLLECTION

<div><div><div>Mahogany brown Cod: EB-8016</div><div>Brown colors</div></div><div></div></div>	<div><div><div>Oxide red Cod: ER-3009</div><div>Brown colors</div></div><div></div></div>	<div><div><div>Copper brown Cod: EB-8004</div><div>Brown colors</div></div><div></div></div>	<div><div><div>Orange brown Cod: EB-8023</div><div>Brown colors</div></div><div></div></div>	<div><div><div>Reddish lilac Cod: EV-4001</div><div>Blue colors</div></div><div></div></div>	<div><div><div>Dove blue Cod: EB-5014</div><div>Blue colors</div></div><div></div></div>
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ESSENCE COLLECTION

<div><div><div>Bright blue Cod: EB-5007</div><div>Blue colors</div></div><div></div></div>	<div><div><div>Grayish blue Cod: EB-5008</div><div>Blue colors</div></div><div></div></div>	<div><div><div>Blackish green Cod: EG-6012</div><div>Green colors</div></div><div></div></div>	<div><div><div>Olive green Cod: EG-6003</div><div>Green colors</div></div><div></div></div>	<div><div><div>Olive gray Cod: EG-7002</div><div>Green colors</div></div><div></div></div>	<div><div><div>Olive yellow Cod: EY-1020</div><div>Green colors</div></div><div></div></div>
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<div><div>Graphite gray Cod: EG-7024</div><div>Gray colors</div><div></div></div>	<div><div>Basalt gray Cod: EG-7012</div><div>Gray colors</div><div></div></div>	<div><div>Silver gray Cod: EG-7001</div><div>Gray colors</div><div></div></div>	<div><div>Window gray Cod: EG-7040</div><div>Gray colors</div><div></div></div>	<div><div>Traffic white Cod: EW-9016</div><div>White colors</div><div></div></div>	<div><div>Signal white Cod: EW-9003</div><div>White colors</div><div></div></div>
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We take advantage of the materiality of the glass. Suncol Facade offers a wide range of surfaces to better adapt to the characteristics of the project and the urban context.

The surface finishes, in particular the Natural surface, are proposed in combination with specific Material Collections capable of enhancing the veins of the natural world.

You can customize the Suncol surface with different tactile surfaces capable of generating interesting lighting effects.

We also offer Flat and Cannette surfaces available in Glossy, Soft Touch and Matte versions to better adapt to the desired light effect.

 Zoom of natural surface finishes with Granite effect



NATURAL

A 3D surface, tactile and textured, to enhance the veins of the natural world. (Available in Granite, Corten and Bush hammered effects)



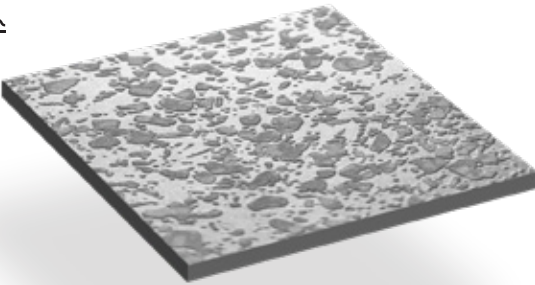
CANNETTE

Wavy surface capable of producing interesting light effects. (Available in glossy, soft touch and matte effects)

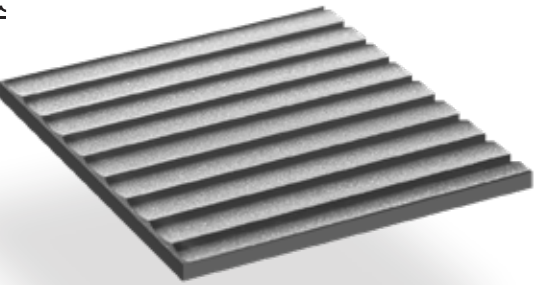


FLAT

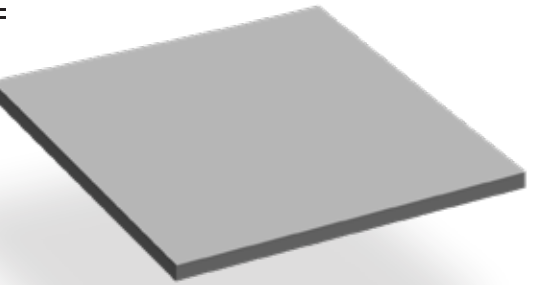
The classic and traditional smooth glass surface. (Available in glossy, soft touch and matte effects)



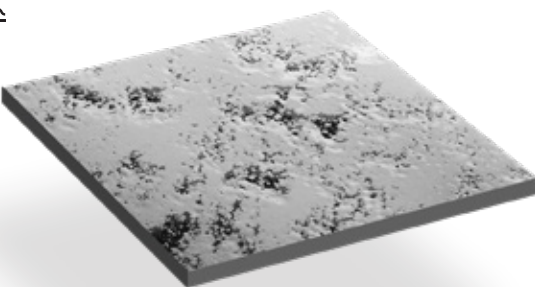
**Natural
Granite effect**
Recommended for
Granite textures



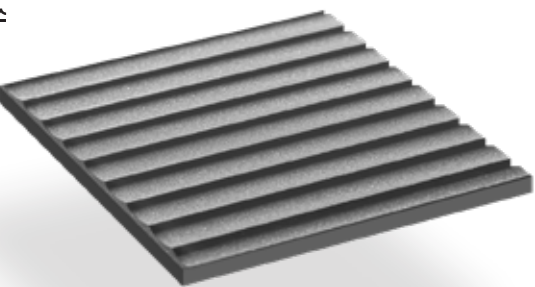
**Cannette
Glossy effect**
Recommended for
Essence colors



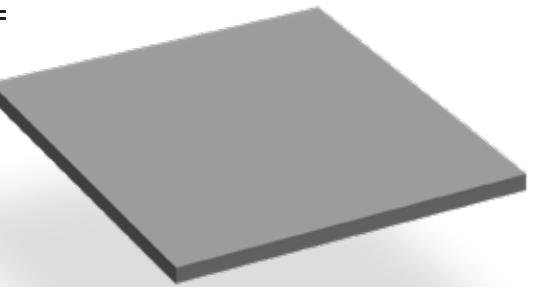
**Flat
Glossy effect**
Recommended for
Essence colors



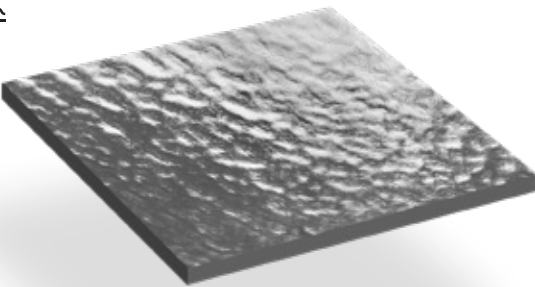
**Natural
Corten effect**
Recommended for Metal
and Concrete textures



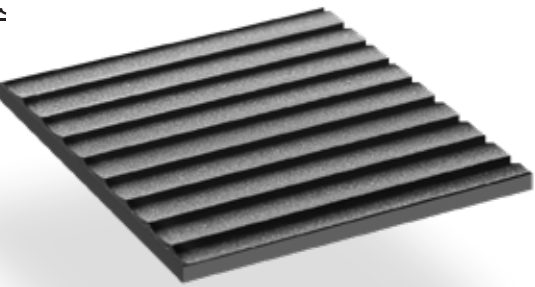
**Cannette
Soft touch effect**
Recommended for
Essence colors



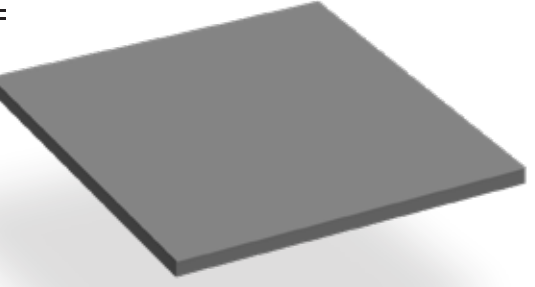
**Flat
Soft touch effect**
Recommended for
Essence colors



**Natural
Bush hammered effect**
Recommended for Calcareous
and Stone textures



**Cannette
Matte effect**
Recommended for
Essence colors

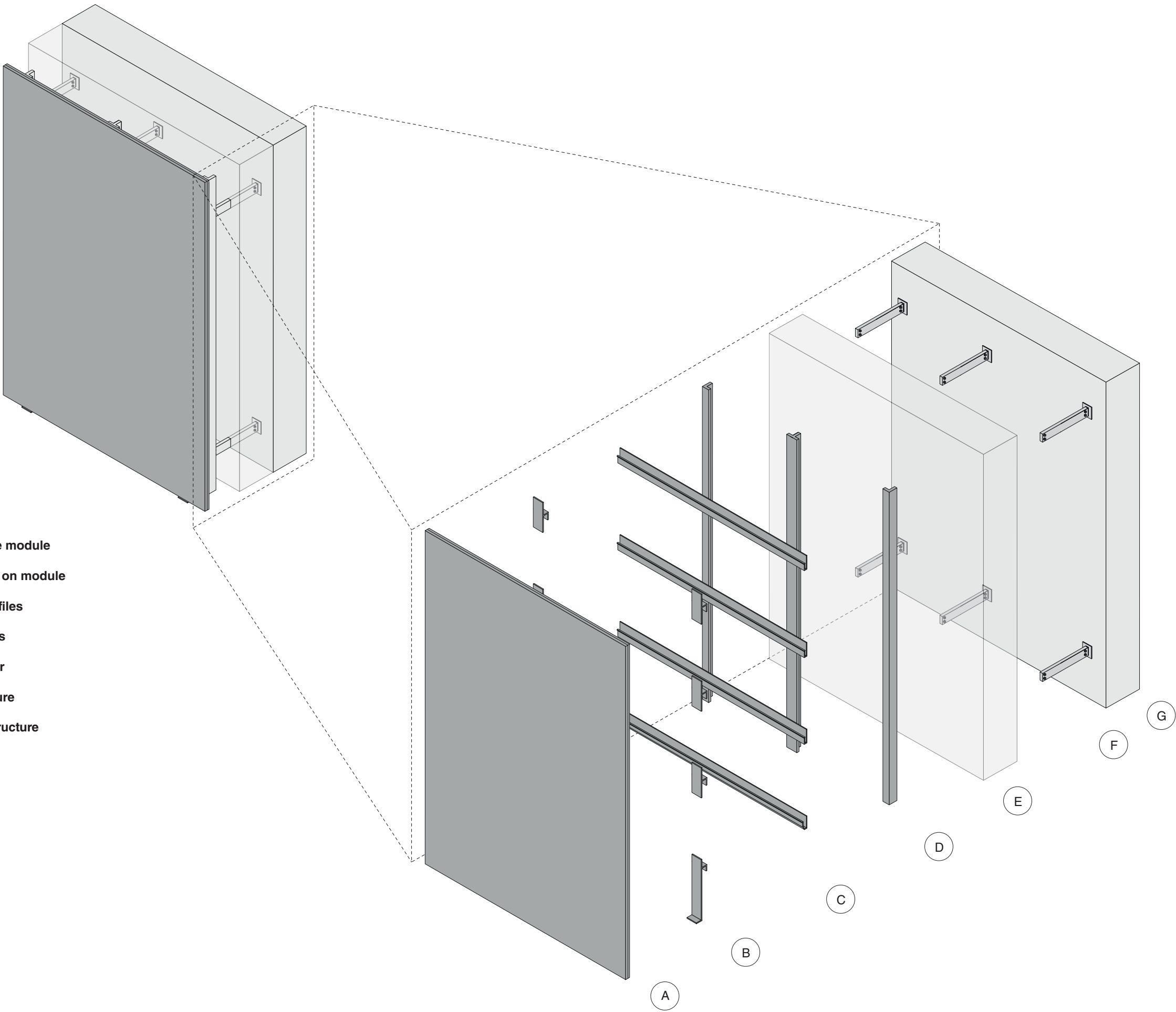


**Flat
Matte effect**
Recommended for
Essence colors

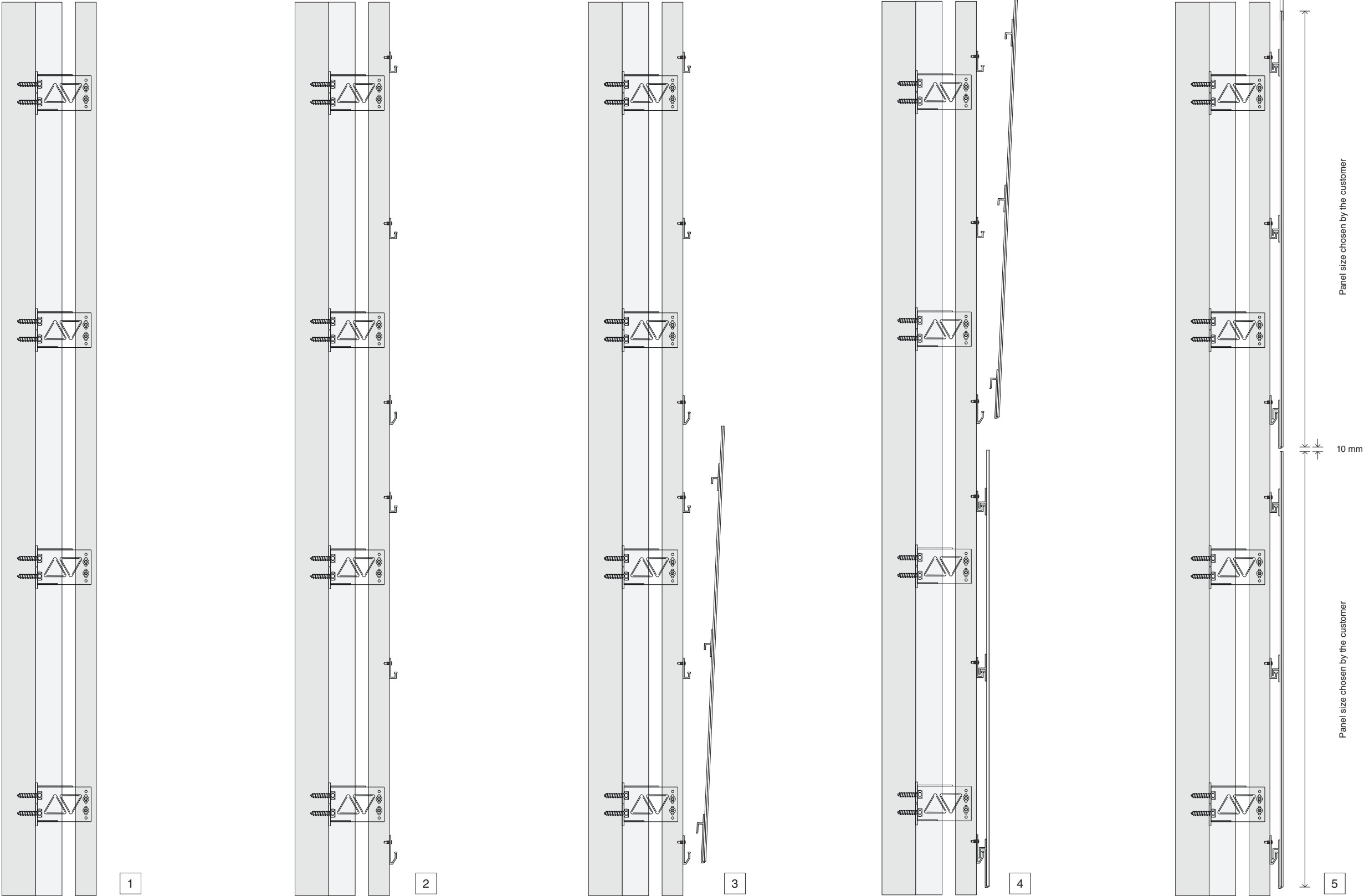
Facade Easy-Fit system

We developed the Facade Easy-Fit system to ensure easy and simple installation. The Facade system allows you to freely compose the facade through a system of hooks applied partly directly on the back of the panel (B. Bracket) and partly on the structure (C. Horizontal profile). Panel with Brackets is embedded in the Horizontal Profiles, which are fixed to the Vertical Profiles (D.), all supported by the Primary Structure (E.). This give lift and stability making the whole structure solid. Type of insulating layer (F.) and its thickness are chosen by the customer. The Primary Structure is available in different lengths and types and is fixed to the Supporting Structure of the building (G).

- A. Suncol Facade module
- B. Brackets fixed on module
- C. Horizontal profiles
- D. Vertical profiles
- E. Insulating layer
- F. Primary structure
- G. Supporting structure



Assembly of the panels



Suncol panel is only 9 mm thick

The first phase consists in fixing the primary structure to the building supporting structure (1). Depending on the thickness and type of insulation chosen, the length of the primary structure, capable of fixing and supporting the vertical profiles, also varies. The length of the primary structure and the type of insulation is chosen during the design phase. The horizontal profiles (2), the lower and the upper ones, are fixed on the vertical profiles, at a variable distance according to the module size. After fixing the horizontal profiles, mount the Suncol Facade modules (3). Suncol Facade glued the brackets on the back of the panel to hook it to the horizontal profiles. The modules are fixed by matching the brackets with the horizontal profiles, starting from the lower profile up to the top. After fixing the first module at the bottom, proceed towards the top composing the entire facade (4). Depending on the surface to be covered, the Suncol Facade module can assume different dimensions, thus covering the entire facade. (5) Suncol modules are mounted at a distance of 10 mm to create a continuous and uniform surface. Suncol modules are very light and thin, they are only 9 mm thick.

Fixing panel

The Suncol Facade Easy-Fit system structure is composed of various elements capable of making the entire structure solid and functional.

Starting from the outside, the Brackets (upper and lower) are fixed and glued directly to the back of the Suncol Facade panel. Depending on the desired size, the number of brackets installed may vary. The Brackets are matched with the Horizontal profiles ensuring stability and ease of replacement.

Both the Brackets and Horizontal profiles are distinguished between Upper and Lower, both in form and function. The lower ones have the task of supporting the panel by fixing itself in the lower part while the upper ones are distributed over the entire perimeter of the panel.

Horizontal Profiles are fixed to Vertical Profiles which guarantee their stability and resistance over time.

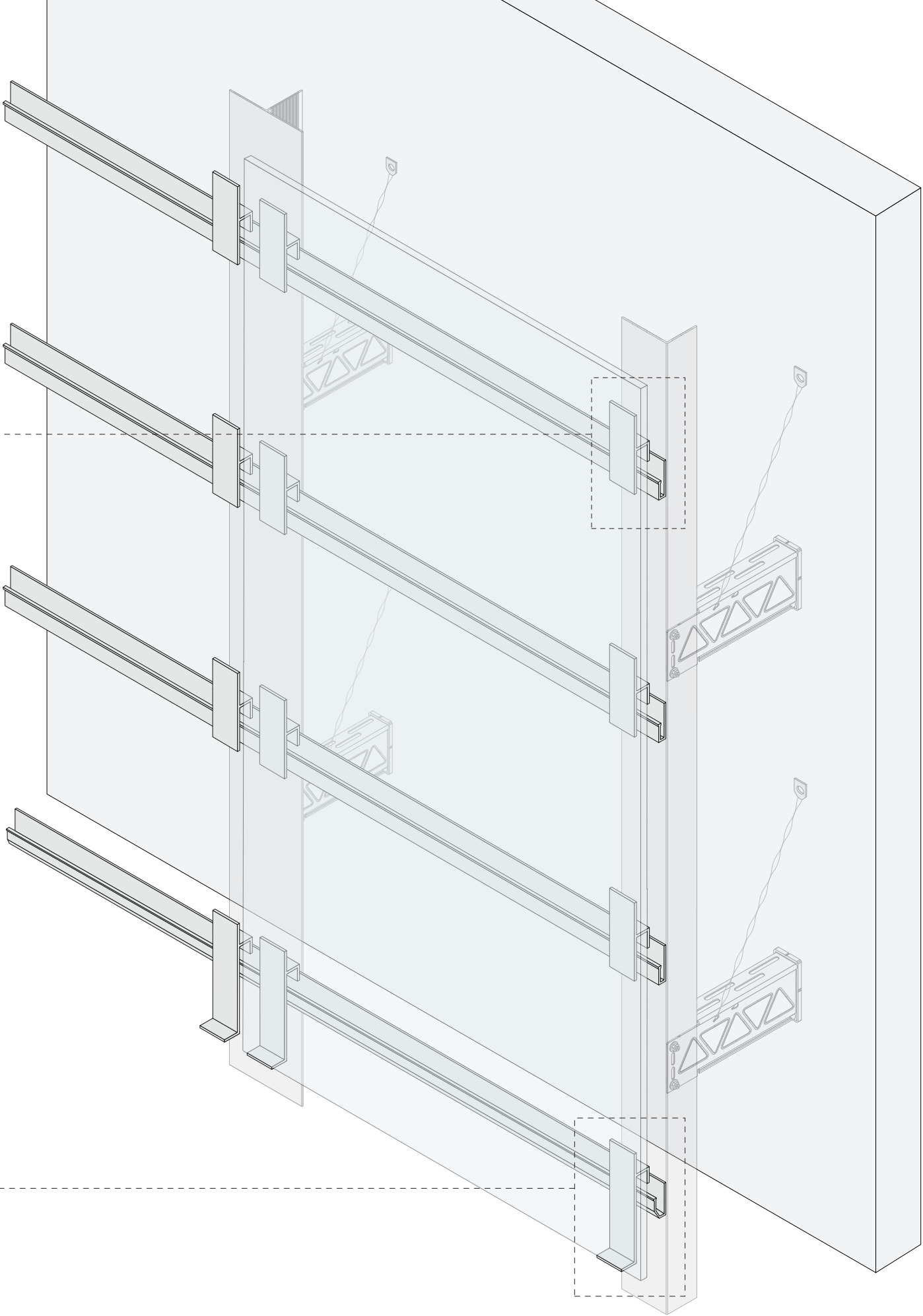
In turn, Vertical profiles are supported by the Primary structure, available in different models and lengths, directly fixed in the Supporting structure of the building.

Upper Bracket

Upper Horizontal profile

Lower Horizontal profile

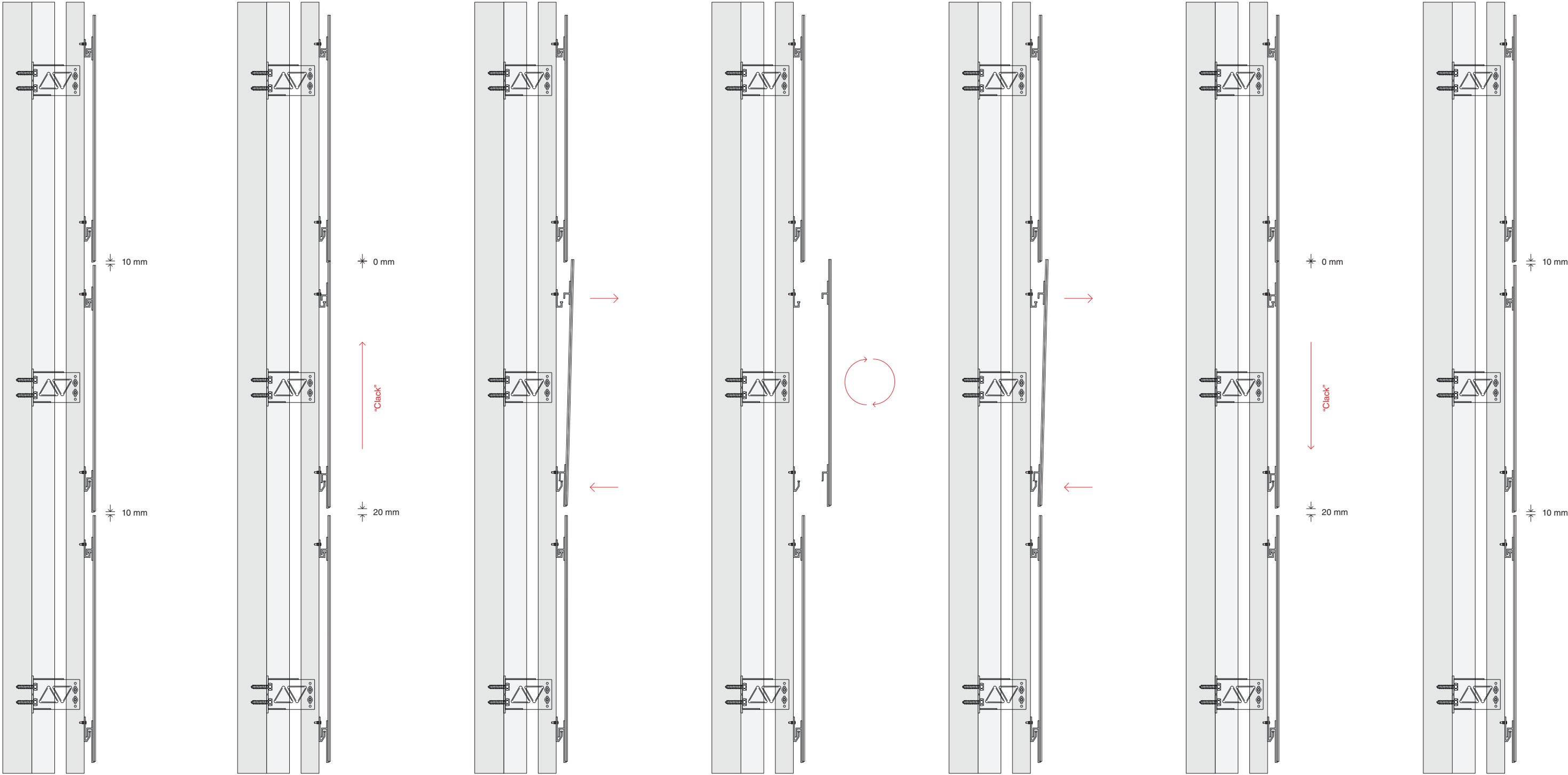
Lower Bracket



Panel replacement

The replacement of the Suncol Facade panel takes place in a simple and intuitive way thanks to the Suncol Easy-Fit system. After identifying the panel to be replaced, the space between the two panels (in standard conditions of 10 mm) allows you to push the surface of the panel to be replaced upwards until you hear a “click”: the Brackets are released from the

horizontal profiles. By applying pressure to the lower part, the panel tilts allowing the module to be extracted from the facade. Once removed, replace the panel and follow the steps in reverse order.





The aesthetic energy surface

Suncol Facade

Opfikon green house
Project overview

This is a renovation project by René Schmid Architekten AG. The building has almost all the facade covered by green structured BIPV modules that power the building while positively impacting its aesthetics.

Location:
Opfikon, Switzerland

Type of building:
Residential

Power installed:
35.1 kWp

Efficiency:
1,35

Surface:
302 sqm

Number of modules:
287

Color:
Blackish green
Olive green

Finishes:
Cannette surface



Thalwil residential
Project overview



This is a project by Tobler Litscher GmbH. The building is characterised by the brown structured glass BIPV modules on the facade and it also includes a customised grey solar roof made with structured glass BIPV modules.

Location:
Thalwil, Switzerland

Type of building:
Residential

Power installed:
32 kWp

Efficiency:
1,23

Surface:
264 sqm

Number of modules:
282

Color:
Mahogany brown

Finishes:
Cannette surface



Winter World
Project overview

The solar system installed on the “winter and sports world” leisure facility in Wallisellen will be one of the largest in the region and among the top 15 across the canton. The photovoltaic panels installed on the facades of the building are sophisticated and adaptable in terms of colour, size and shape.

Location: Wallisellen, Switzerland	Surface: 439.5 sqm
Type of building: Public	Number of modules: 726
Power installed: 50 kWp	Color: Copper Brown
Efficiency: 1,35	Finishes: Flat surface



Kloten Milano
Project overview



The new 8-storey Kloten Milano building has 65 apartments and 650 m2 of commercial space. In this project, the innovative BIPV modules were carefully studied to seamlessly integrate with traditional elements such as ceramic, giving the facade a perception of greater movement.

Location:	Surface:
Kloten, Switzerland	205 sqm
Type of building:	Number of modules:
Residential	160
Power installed:	Color:
21.5 kWp	Graphite gray
Efficiency:	Finishes:
0,12	Flat surface





This office building is being designed to meet high standards for energy efficiency for WWZ Zug, a Swiss supplier of energy, telecommunications and water. The new WWZ Zug building is an office building with an integrated computer centre. The building consists of 3 upper floors for office use and 3 basement floors.

Location:
Zug, Switzerland

Type of building:
Commercial

Power installed:
4.5 kWp

Efficiency:
0,12

Surface:
269 sqm

Number of modules:
142

Color:
Silver gray

Finishes:
Cannette surface



Solar Living Kloten
Project overview



This project by René Schmid Architekten AG has been built in the centre of Kloten, Switzerland. It includes 22 modern apartments and an underground car park that are geared towards a future-oriented way of life. "Solar Living" is the guiding principle of this residential complex and it stands for progressive and conscious living in harmony with nature.

Location:
Kloten, Switzerland

Type of building:
Residential

Power installed:
26.7 kWp

Efficiency:
1,49

Surface:
223 sqm

Number of modules:
408

Color:
Blackish green
Olive green
Olive gray

Finishes:
Cannette surface








Quality and features

<div>PRODUCT LIFE</div> <div>Over 30 years</div>	<div>FACTORY DEFECTS</div> <div>12 years</div>	<div>PERFORMANCE</div> <div>Linear decay ≤ 80% in 25 years</div>	<div>COLOR GUARANTEED</div> <div>Δ E < 3</div>
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CERTIFICATIONS

<div>Our certification authorities:</div> <div>ISO: LL-C Certification</div> <div>IEC: Kiwa Certifications</div>	<div></div> <div>9001:2015</div>	<div></div> <div>14001:2015</div>	<div></div> <div>45001:2018</div>	<div></div> <div>61730</div>	<div></div> <div>61215</div>	<div></div> <div>UNI EN 12600</div>	<div></div> <div>UNI EN ISO 12543</div>
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TECHNICAL FEATURES

<div></div> <div>DURABILITY</div> <div>We lengthened the Suncol surface life cycle. We guarantee it for 30 years.</div>	<div></div> <div>ENERGY SAVING</div> <div>Suncol allows you to collect and store free green energy.</div>	<div></div> <div>PAYBACK TIME</div> <div>Suncol allows a quick return on investment. Payback is approximately after 10 years.</div>
<div></div> <div>DIMENSIONAL STABILITY</div> <div>Suncol is not subject to dimensional variations as it has a low coefficient of thermal expansion.</div>	<div></div> <div>EFFICIENCY</div> <div>Suncol surface combines the best photovoltaic technology for maximum performance.</div>	<div></div> <div>RELIABILITY</div> <div>Suncol technology ensures uncompromising performance and certain results.</div>

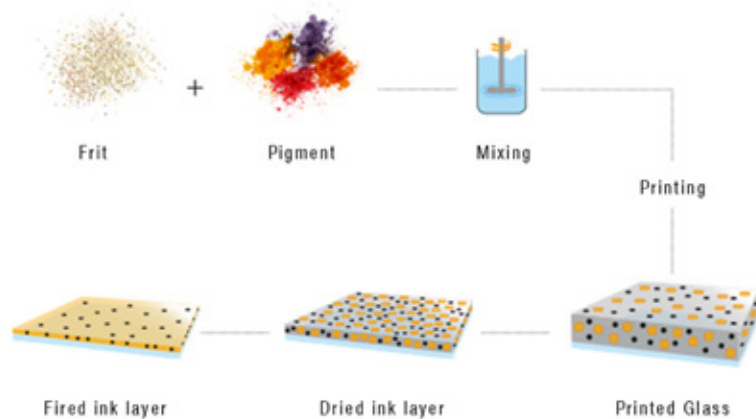
SAFETY FEATURES

<div></div> <div>IMPACT RESISTANT</div> <div>Suncol Surface porosity is average 0,1% and it does not absorb water.</div>	<div></div> <div>DUST & SAND RESISTANCE</div> <div>The surface porosity of Suncol is on average 0.1% and does not absorb water.</div>	<div></div> <div>FIRE CLASS A</div> <div>The surface porosity of Suncol is on average 0.1% and does not absorb water.</div>
<div></div> <div>HEAT RESISTANT</div> <div>The Suncol technology remains efficient even in extreme heat conditions, up to 80°C.</div>	<div></div> <div>THERMAL RESISTANT</div> <div>Suncol surface is resistant to rapid climate changes and thermal shocks.</div>	<div></div> <div>FREEZE RESISTANT</div> <div>The suncol technology remains efficient even in extreme heat conditions, up to -20°C.</div>

GENERAL DESCRIPTION	<p>The specified glass is a low-iron glass for use in photovoltaic and solar thermal sector.</p> <p>The product is available as patterned glass with the surface structures mat/mat. Available in 3,2 mm thickness.</p>
CHEMICAL COMPOSITION	<p>Silicon dioxide (SiO2) 68-73%</p> <p>Sodium oxide(Na2O) 9-16%</p> <p>Calcium oxide (CaO) 5-13%</p> <p>Magnesium oxide (MgO) 0- 6%</p> <p>Aluminum oxide (Al2O3) 0- 3%</p> <p>Iron oxide (Fe2O3) <0,014%</p>
MECHANICAL CHARACTERISTICS	<p>Density (at 18°C) (ρ) - 2500 kg/m³</p> <p>Young's modulus (E) - 7x1010 Pa</p> <p>Poisson's ratio (μ) - 0,2</p> <p>Specific heat capacity (c) - 0,72 x 103 J/(kg·K)</p> <p>Nominal value of average coefficient of linear expansion between 20°C and 300°C (α) 9 x 10-6 K-1</p> <p>Thermal conductivity (λ) - 1 W/(m·K)</p>

PHYSICAL COMPOSITION	<p>Maximum snow load 5400 Pa</p> <p>Maximum load tested 8000 Pa</p> <p>Maximum wind speed 130 Km/h</p> <p>Hail G3 Class; Ø 25 mm; 82 Km/h</p> <p>Reaction to fire Class 1</p> <p>Thickness 8 mm (0.5mm / +1.5mm)</p> <p>Front Glass Thickness 3.2 mm</p> <p>Back Glass Thickness 3.2 mm</p> <p>Cells Mono-crystalline cells 166 x 166 mm high efficiency</p> <p>Encapsulant EVA Solar</p> <p>Junction Box JB IP 67</p> <p>Connector Features MC4 original</p> <p>Cable Characteristics Ø 4 mm2 length 800 mm</p>
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COATING OVER THE TIME



Suncol Coating process consists in a special mineral coating on one glass side vitrified in a high temperature curing. The color is integrated into the glass mass as a unique product for great durability. The color remains unchanged over the time.


UV TEST

In over 5000 hours of tests (estimated as equivalent to 20 years of real exposure in central Europe) on Solar, light, UV, PV transmittance and color L*a*b*, **the change in efficiency is almost nothing.**

Material collection data Essence collection data

	250 hours	1250 hours	2500 hours	5000 hours
Solar transmittance AM1.5, ISO9845	$\Delta E \leq 0,001$ $\Delta E \leq 0,001$	$\Delta E \leq 0,001$ $\Delta E \leq 0,001$	$\Delta E \leq 0,001$ $\Delta E \leq 0,001$	$\Delta E \leq 0,001$ $\Delta E \leq 0,002$
Light transmittance D65, EN410	$\Delta E \leq 0,003$ $\Delta E \leq 0,001$	$\Delta E \leq 0,004$ $\Delta E \leq 0,001$	$\Delta E \leq 0,005$ $\Delta E \leq 0,001$	$\Delta E \leq 0,005$ $\Delta E \leq 0,003$
UV transmittance ISO9050	$\Delta E \leq 0,001$ $\Delta E \leq 0,025$	$\Delta E \leq 0,001$ $\Delta E \leq 0,024$	$\Delta E \leq 0,001$ $\Delta E \leq 0,024$	$\Delta E \leq 0,001$ $\Delta E \leq 0,028$
PV transmittance AM1.5 * poly-Si	$\Delta E \leq 0,001$ $\Delta E \leq 0,0001$	$\Delta E \leq 0,001$ $\Delta E \leq 0,0001$	$\Delta E \leq 0,002$ $\Delta E \leq 0,0001$	$\Delta E \leq 0,001$ $\Delta E \leq 0,001$
Photosynthetically active radiation	$\Delta E \leq 0,002$ $\Delta E \leq 0,001$	$\Delta E \leq 0,003$ $\Delta E \leq 0,002$	$\Delta E \leq 0,004$ $\Delta E \leq 0,001$	$\Delta E \leq 0,004$ $\Delta E \leq 0,003$
Color L*a*b*				
L*	$\Delta L \leq 0,3$ $\Delta L \leq 0,10$	$\Delta L \leq 0,4$ $\Delta L \leq 0,10$	$\Delta L \leq 0,4$ $\Delta L \leq 0,10$	$\Delta L \leq 0,4$ $\Delta L \leq 0,2$
a*	$\Delta a \leq 0,12$ $\Delta a \leq 0,04$	$\Delta a \leq 0,13$ $\Delta a \leq 0,04$	$\Delta a \leq 0,14$ $\Delta a \leq 0,01$	$\Delta a \leq 0,12$ $\Delta a \leq 0,001$
b*	$\Delta b \leq 0,01$ $\Delta b \leq 0,21$	$\Delta b \leq 0,17$ $\Delta b \leq 0,20$	$\Delta b \leq 0,24$ $\Delta b \leq 0,23$	$\Delta b \leq 0,25$ $\Delta b \leq 0,25$

The electrical data comes from laboratory tests and will be confirmed by post-production tests.

Electrical data examples	 Suncol Facade
	Values per sqm
Essence Collection Graphite gray color	
Vmp (V)	21,10
Imp (A)	6,98
Power (Wp)	145,00
Voc (V)	24,79
Isc (A)	7,38
Temp. Coeff. Isc (%/°C)	0,05
Temp. Coeff. Voc (%/°C)	-0,29
Temp. Coeff. Pmax (%/°C)	-0,40
Material Collection Worked charcoal texture	
Vmp (V)	21,10
Imp (A)	6,87
Power (Wp)	145,00
Voc (V)	24,79
Isc (A)	7,26
Temp. Coeff. Isc (%/°C)	0,05
Temp. Coeff. Voc (%/°C)	-0,29
Temp. Coeff. Pmax (%/°C)	-0,40

Here two sample colors are selected to show the electrical efficiency parameters of all colors and textures. Graphite gray color for the essence collection available on all Suncol products and the Worked charcoal texture normally available only for Suncol Facade.

Ask our experts for complete electrical data for every color or texture collections.

Notes:
The electrical data comes from laboratory tests and will be confirmed by post-production tests. The electrical specifications are measured under STC conditions (1000 W/sqm, 1.5 Air Mass Spectrum, cells temperature 25°C); the reference module used to set our Sun Simulator has been calibrated by SUPSI University (Switzerland). The accuracy of the given figures is a function of the calibration tolerance of the reference module and of the guaranteed performances of our Sun Simulator.

GEOMETRICAL TOLERANCES	<p>If not requested in a different way by the client, we use following tolerances:</p> <p>Glass thickness: +/- 0.2 mm</p> <p>Length and width: +/- 1,5 mm</p> <p>Angularity (difference between length of both diagonals): 2 mm</p>	THERMAL TOUGHENED GLASS	<p>The mentioned glass of this specification can, if requested by the client, be thermal toughened. The glass then has following mechanical and physical properties.</p> <p>Flatness: Local bow: 0.7mm/300mm</p> <p>Bending strength: Solar glass ≥ 90 N/mm²</p>												
GLASS QUALITY (BUBBLES, SCRATCHES, INCLUSIONS) sqm	<p>The visual inspection of the glass is done in a frontal position with a distance of 1,5m for 20 seconds with a black background (distance between glass and background about 10 cm) with direct natural light.</p> <p>Eventual defects can be classified according to the table:</p> <table><tr><td>Longitudinal bubbles max. width 1 mm</td><td>Round bubbles</td><td>Scratches max. width 1 mm</td></tr><tr><td>Length < 5 mm max. 4 pieces</td><td>Diameter < 0,3 mm unlimited</td><td>Length > 10 mm, 1 piece</td></tr><tr><td>5 < Length < 10 mm max. 1 pieces</td><td>0,3 mm < Diam. < 1,0 mm max. 3 pieces</td><td></td></tr><tr><td></td><td>Diameter > 1,0 mm max. 1 piece</td><td></td></tr></table>			Longitudinal bubbles max. width 1 mm	Round bubbles	Scratches max. width 1 mm	Length < 5 mm max. 4 pieces	Diameter < 0,3 mm unlimited	Length > 10 mm, 1 piece	5 < Length < 10 mm max. 1 pieces	0,3 mm < Diam. < 1,0 mm max. 3 pieces			Diameter > 1,0 mm max. 1 piece	
Longitudinal bubbles max. width 1 mm	Round bubbles	Scratches max. width 1 mm													
Length < 5 mm max. 4 pieces	Diameter < 0,3 mm unlimited	Length > 10 mm, 1 piece													
5 < Length < 10 mm max. 1 pieces	0,3 mm < Diam. < 1,0 mm max. 3 pieces														
	Diameter > 1,0 mm max. 1 piece														
EDGES AND CORNERS	<p>Edge processing</p> <p>Corner treatment</p>	<p>Fully grinded C-shape</p> <p>Complete round grinded</p>													

General warranty conditions

MATERIALS AND QUALITY OF EXECUTION

SUNCOL guarantees that the modules are free from defects in material or workmanship under normal conditions of application, installation, use and service. If the product does not comply with this limited warranty, SUNCOL undertakes, at its own discretion for a period ending 12 years (144 months) from the date of sale to the original purchaser/customer, to repair or replace the product or refund the purchase price. Repair, replacement or refund will be the only means of redress provided under this warranty.

The color is guaranteed for a period of 10 (ten) years. The result compared to the value measured between and in the sheets or compared to the mock-up must be $\Delta E \leq 3$ outer glass side.

POWER OUTPUT

SUNCOL guarantees for a period of 25 (twenty-five) years from the date of sale to the original purchaser/customer that the rated power under standard test conditions will remain at least 80% of the nameplate power of the module. Initial decay 3.0% the first year, followed by 0.68% per year, up to a minimum of 80% of the rated power of the module after 25 years.

At its own discretion, SUNCOL undertakes to repair or replace the product, to refund the purchase price or to provide the purchaser with additional modules to make up for the power failure, provided that it is established that this degradation is due to defects in material or workmanship under normal conditions of installation, application and use. The relevant power rating specified by SUNCOL is defined in the SUNCOL product data sheet valid at the time of shipment. Standard Test Conditions (STC) means an irradiation level of 1000W/m², at 25°C solar cell temperature and an AM 1.5 spectrum.

LIMITS AND CONDITIONS

Expect when otherwise declared in writing by SUNCOL, the terms provided in these General Conditions of Limited Warranty shall be the sole means of legal recourse. The limited warranty referred to in this document does not apply to modules which, according to the sole discretion of SUNCOL, have been subject to improper use, negligence, accident (among which, damage caused by natural disasters or other exceptional events), or which have been damaged because of actions not authorized by SUNCOL such as, for example, misuse, tampering, alterations, repairs, other installations or incorrect applications or due to negligence in use, in storage, during transport, in handling and during routine maintenance.

The General Conditions of Limited Warranty do not, under any circumstances, cover costs connected to installation, removal, testing, packaging, transport or re-installation of the module, other costs regarding the fruition of the service of Limited Warranty or those connected to lost profit or earnings connected to performance or lack of performance of defective modules.

Modules repaired or substituted by SUNCOL by means of recourse in Limited Warranty will not be entitled to further periods of warranty, in respect of the original duration regarding the original product purchased. The modules, components and products substituted in warranty become property of SUNCOL .The terms of Limited Warranty of these General Conditions are applicable only for the original client/ purchaser of the modules, respectively for any following owner of the original installation or site where the modules have been installed and have remained without undergoing any kind of alteration (except for those agreed to in writing together with SUNCOL).

The conditions of this Limited Warranty supersede and replace any other limited warranty, expressed or implied, previously stipulated, including for information purposes only, the limited warranties regarding commercialization and fitness for particular purpose, use or application, and all other obligations or responsibility of SUNCOL, except in the case that said Limited Warranty, obligations or responsibility are expressly agreed to in writing, signed and approved by SUNCOL.

SUNCOL shall not be held responsible in any way for damage or injury caused to people or goods, or for other losses or injuries that should, in any way, come about or be connected in any way to the product, including for information purposes only, eventual defects of the module or connected to its use or installation. SUNCOL shall not be held responsible in any way for emerging or particular damage, caused to accessories, howsoever caused. Any overall responsibility of SUNCOL in relation to damage or other shall not exceed the price received by the retailer, per unit of product or for services provided or to be provided, as the case may require, object of the recourse or dispute.

If any part, provision or clause of these General Conditions of Limited Warranty, the sales conditions and the application of the same to persons or circumstances, are subsequently declared not valid, invalid or unenforceable, said conditions shall not concern the other parts, provisions, clauses or applications of the remaining terms and conditions, and shall therefore be considered not invalid. Any recourse or dispute concerning this Limited Warranty shall be governed by and construed pursuant to Swiss laws.

Limited warranty services

Should the end user deem necessary to recourse to the conditions of Limited Warranty, he is required to notify in writing promptly and in advance to: SUNCOL with regards to his request.

The client must submit a written request, including proof of purchase of the module, serial number and type of failure of the product. SUNCOL shall determine, at its own discretion, the suitability of the request. SUNCOL may request that the product, object of the recourse in Limited Warranty, be sent back to the factory, at the client's expense. If the product is deemed faulty and is replaced without being sent back to SUNCOL, the client must send to SUNCOL the documentation proving that the product has been destroyed or disposed of correctly.

Discover Suncol energy revolution

Suncol S.r.l.
P.IVA: IT 03968210132

Via S. Maurizio, 66
22036 Erba (CO) Italy

Website:
www.suncol.com
Mail:
suncol@suncol.com

Export Manager:
Linda Saccani
sales@suncol.com
+39 335 6039017

Power by:
Glassfer and Sunage

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