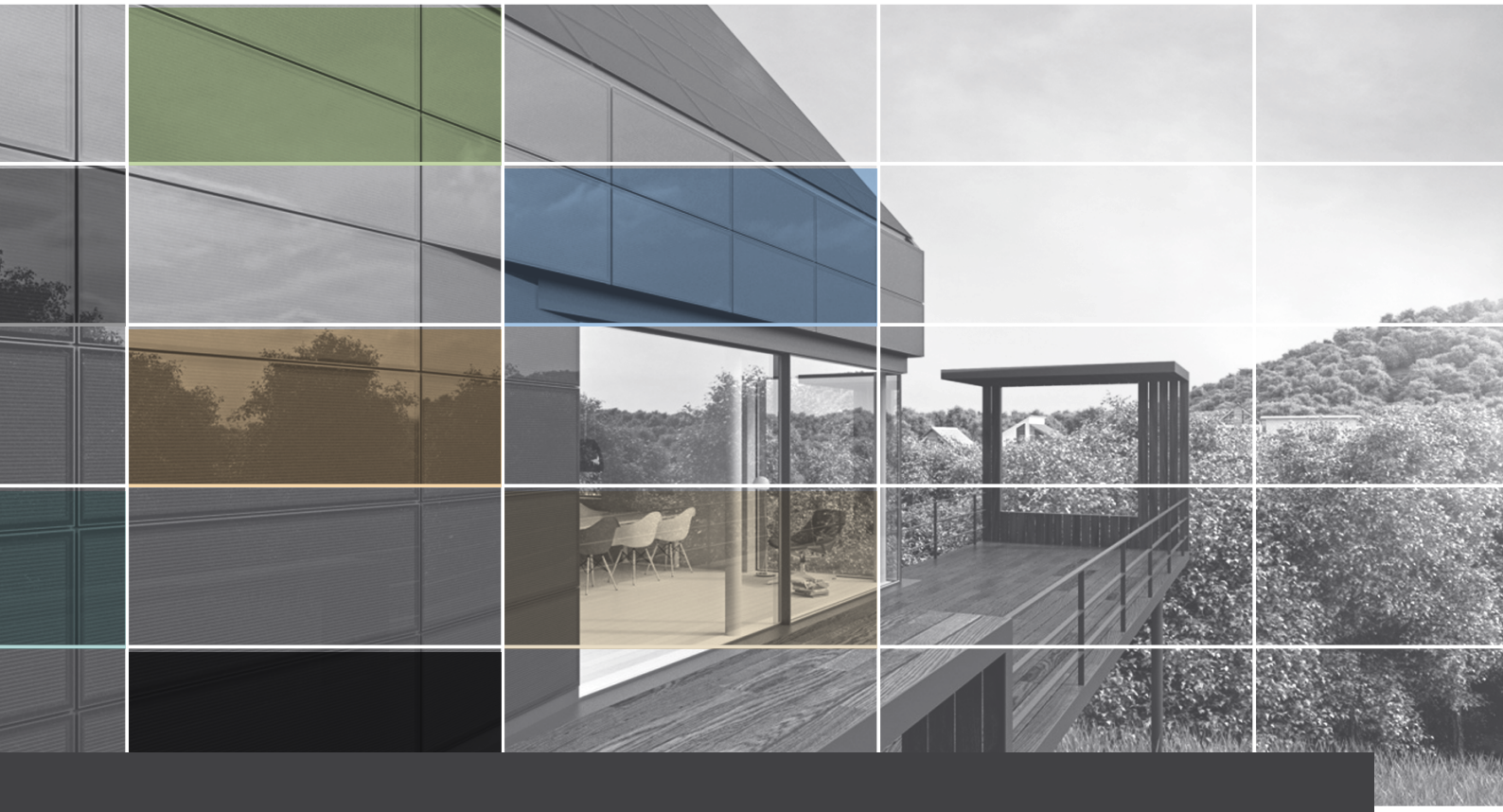
PowerMax® SKALA

ARCHITECTS PANELS



APPLICATIONS AND TECHNICAL SPECIFICATIONS

ENGLISH

AVANCIS CNBM

SKALA – THE AVANCIS ARCHITECTS PANEL

The AVANCIS SKALA solar panel is the architectural PV module series designed as a premium component for the building industry to meet the needs in energy efficiency, design and quality of solar façades – for public, commercial as well as residential buildings.

This 'solar-active' building material is state-of-the-art in architecture. Scalable in form and colour, SKALA modules set new standards for project-specific and aesthetic solar façade solutions. Architects, façade planners and investors can realize energy-producing solar systems with the highest aesthetics, sustainability and efficiency in their construction projects.

Design and Aesthetics

Aesthetics is the key in the building envelope. With the innovative CIGS thin-film module design, SKALA provides a consistent frameless surface in an uniform colour. The unique back-rail system enables a shaped mounting of the system without any visible clamping of the front glass. So, SKALA solar panels provide a smooth and elegant glass surface.

SKALA is available in various formats and colours and can be applied in portrait or landscape mode*. This provides a wide scope of freedom in design and flexibilty in façade planning.

Quality and Efficiency

AVANCIS products are designed and manufactured in Germany and engineered to resist harsh climate and weather conditions. The glass/glass SKALA solar panels are designed to resist global weather conditions and diverse wind load stresses in the building envelope.

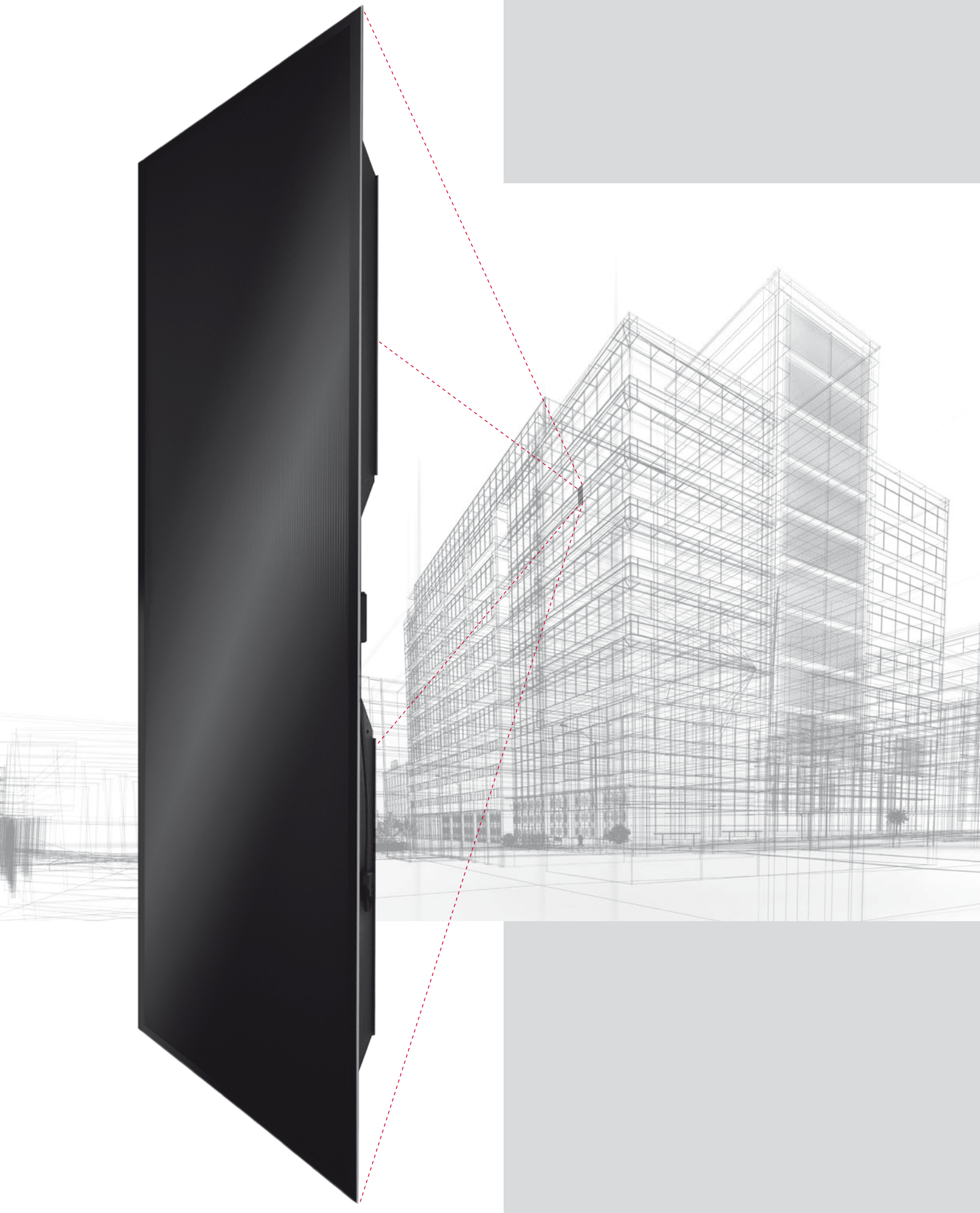
The special characteristic of CIGS thin-film technology provides the highest energy output with a broad spectral sensitivity. This also helps to generate electricity beyond the optimal solar radiation conditions – with shallow angles of sunlight, cloudy skies, shadowing effects and hot temperatures.

Sustainability

SKALA solar panels are no ordinary façade cladding material. These are multifunctional building materials generating clean solar energy as a functional add-on. The materials used fulfil not only the requirements of sustainable construction, but also achieves excellent environmental performance and improves the energy performance of the building.

As for all AVANCIS products, sustainability starts with production: With fully vertically integrated production and the spearheading CIGS thin-film technology, the input of material and energy is reduced. Thanks to the use of environmentally friendly material without any toxic components, the products can be easily recycled.

* depending on national, regional and local building regulations.



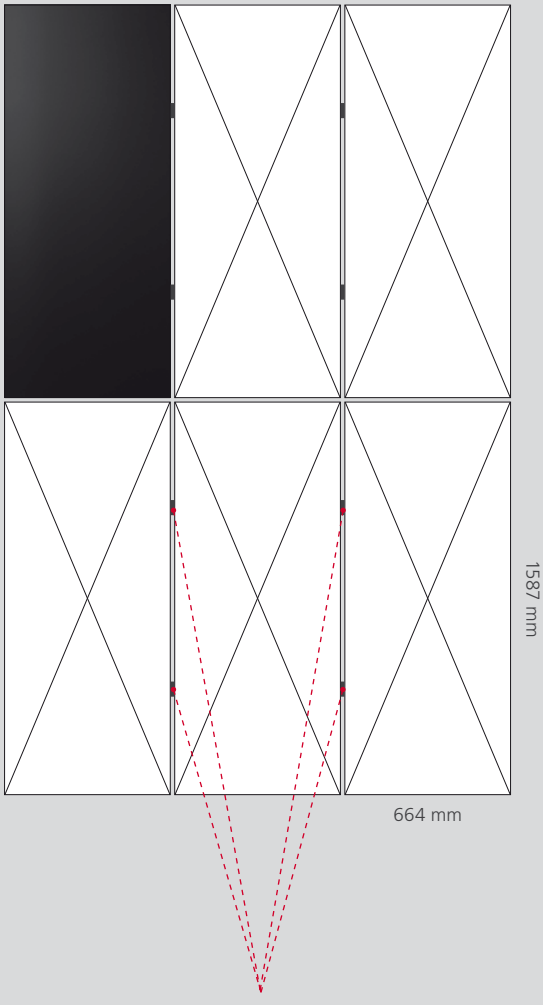
MOUNTING: MAXIMUM FREEDOM OF DESIGN

SKALA architectural solar modules can be applied in landscape and portrait format for maximum freedom of architectural design, according to regional and local restrictions.

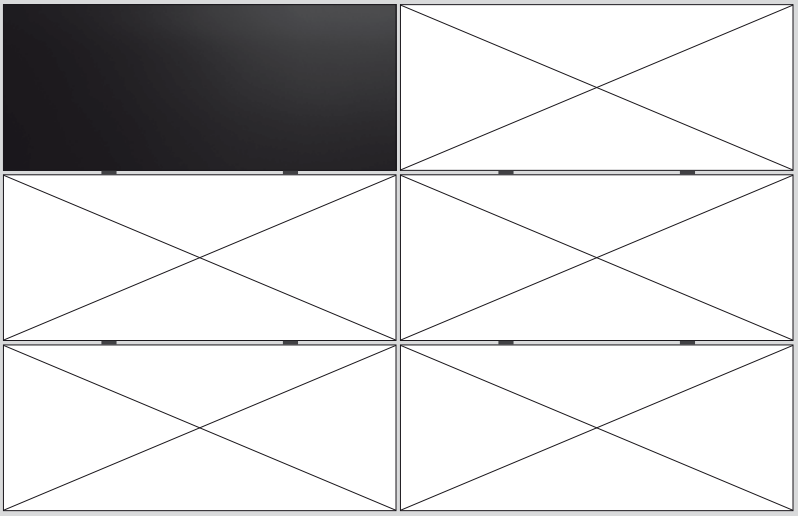
The SKALA panels are mounted with the special AVANCIS clamp on the mounting structure. This special clamp is part of the certification of the SKALA panel and guarantees a secure mounting on the support structure. This clamping method also provides a smooth glass surface with a defined distance between the panels.

SKALA is compatible with a variety of standard mounting profiles and is particularly designed for ventilated façade systems.

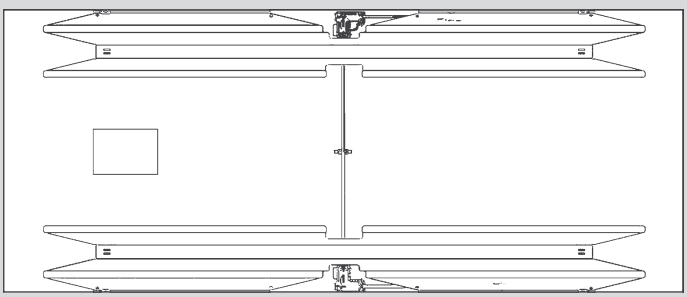
Portrait Mounting



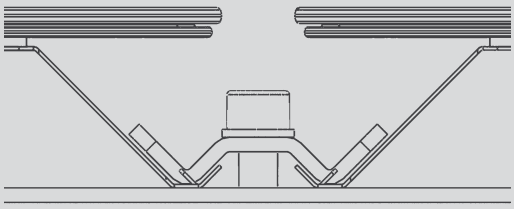
Landscape Mounting



Backside of the Module with the unique Backrail System



Secure Mounting with AVANCIS Clamps

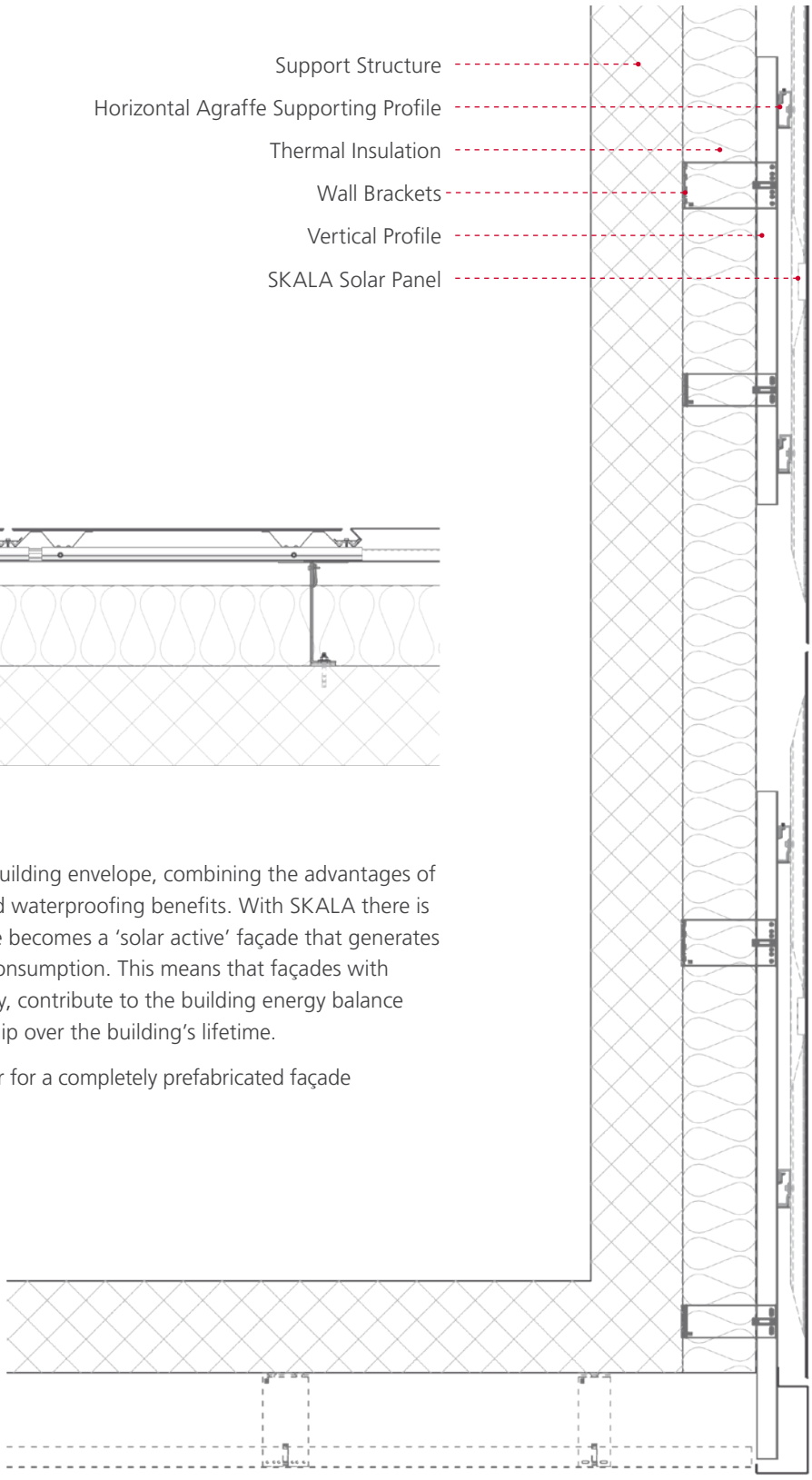


VENTILATED FAÇADE SYSTEMS WITH SKALA

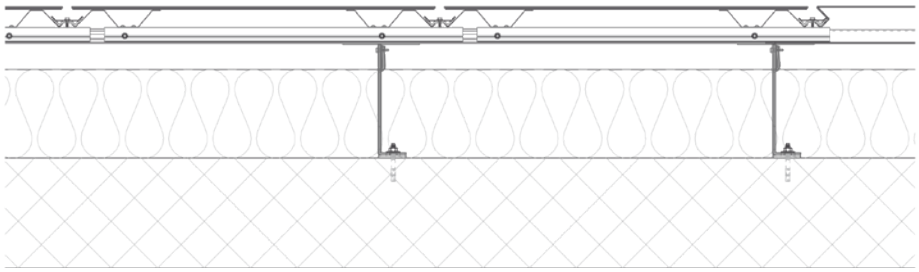
SKALA panels are designed for the usage in innovative and functional ventilated façade systems. They are part of an energy efficient and sustainable building envelope.

In order to ensure the maximum performance of the modules, please make sure to provide a sufficient amount of ventilation for cooling and draining condensation or moisture.

Vertical Cut



Horizontal Cut



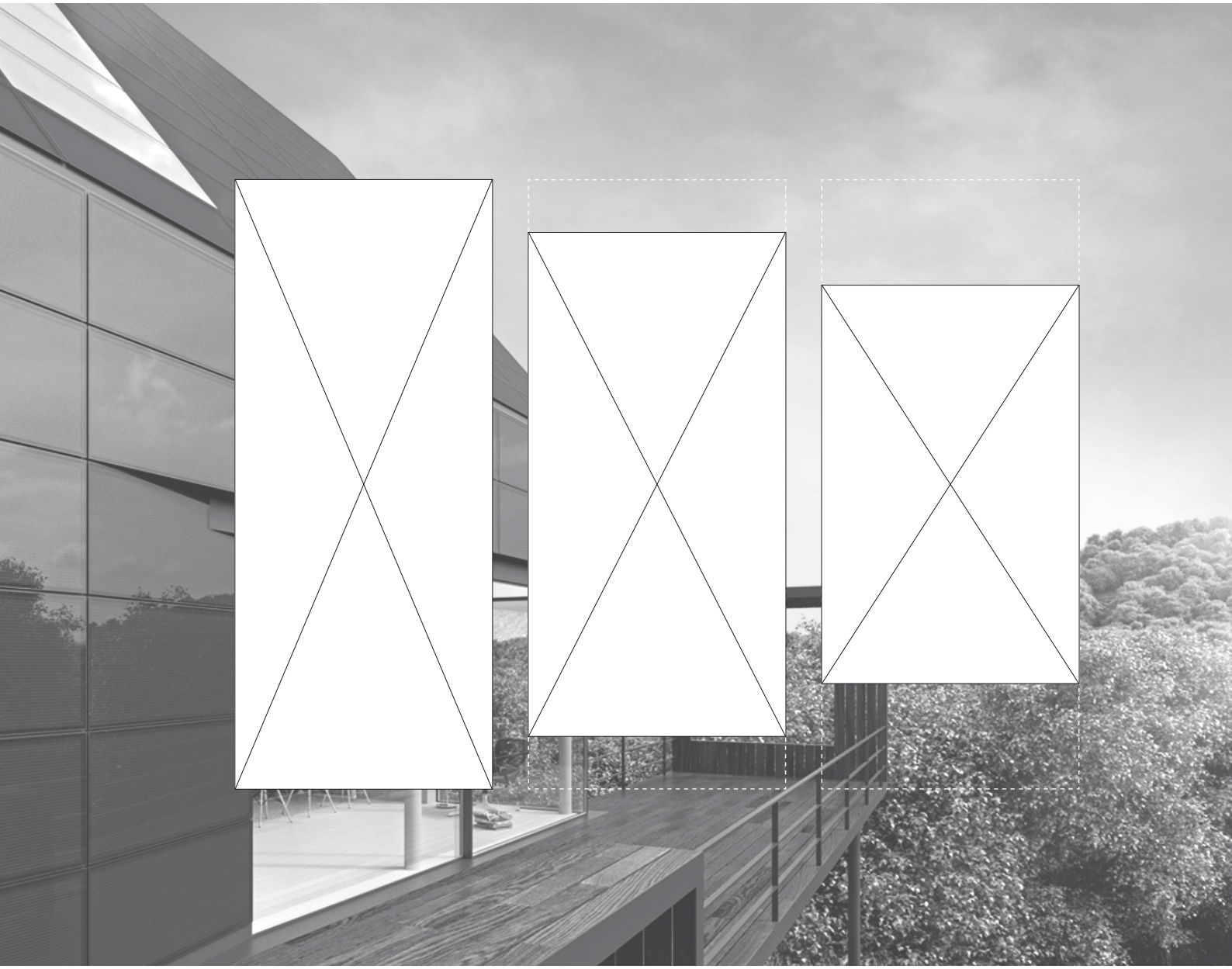
Ventilated façades are a multifunctional building envelope, combining the advantages of a high aesthetic solution with thermal and waterproofing benefits. With SKALA there is an additional benefit: The 'passive' façade becomes a 'solar active' façade that generates electricity to cater the building's energy consumption. This means that façades with SKALA panels are environmentally friendly, contribute to the building energy balance and bring down the total cost of ownership over the building's lifetime.

SKALA is your tailor made panel – whether for a completely prefabricated façade construction or a turnkey façade solution.

CUSTOMIZED SOLUTIONS FOR INDIVIDUAL BUILDING ENVELOPES:

SCALABLE IN SIZE

SKALA architecture modules have a standard format of 1,587 mm x 664 mm. Each module can also be individually customized, so the combination of standard and size-adjusted modules creates exclusive and tailor-made solar façades. Thus, builders, architects and façade designers have the greatest possible freedom for their design planning and arrangement of the building envelope.

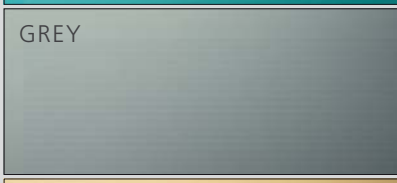


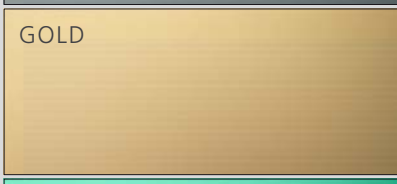
… AND IN COLOUR

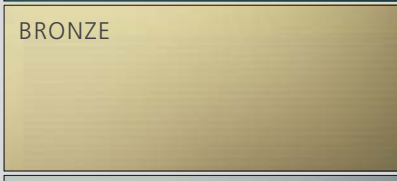
Due to the cell structure of the semiconductor, SKALA solar panels are distinguished by a uniform black panel surface with a fine pinstripe look. Thanks to an adapted production process and strict quality guidelines especially in the optical sector, SKALA architectural modules are dedicated for high aesthetic requirements.

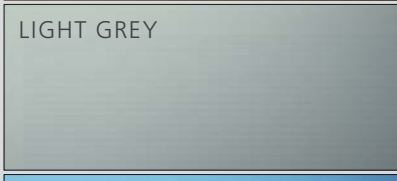
Standard Panel Colour

SKALA Colours









The Colour Principle

By using coloured front glases, SKALA architecture modules can be produced in different colours. Contrary to conventional coloured PV modules, they use the reflection of sunlight to produce their colour.

The front glass reflects the narrow spectral range of the visible light to generate the colour. The rest of the light spectrum is transferred to the module and converted into energy.

SPECIFICATIONS FOR STANDARD SIZE IN BLACK

MECHANICAL SPECIFICATIONS

PowerMax® SKALA	Value
External dimensions	1,587 x 664 mm²
Thickness	38 mm
Weight	17 kg
Cell type	CIGS
Frame	none
Front cover	3.2 mm tempered glass
Anti reflective coating	yes
Junction box protection class	IP67
Dimensions of the junction boxes	60 x 60 x 11.5 mm³
Cable lengths (⊖ plug I ⊕ socket)	200 I 320 mm
Cable cross section	2.5 mm²
Connector type	TPCB-4

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Safety Class II

CE

- Design qualification and type approval, IEC 61646
- Safety qualification, IEC 61730

ELECTRICAL SPECIFICATIONS

Data measured under standard test conditions (STC):

PowerMax® SKALA	145
Nominal power P_{nom}*	145 W
Sorting	-0/+5 W
Module efficiency η	13.8 %
Aperture efficiency η	15.2 %
Open-circuit voltage V_{OC}*	80.1 V
Short-circuit current I_{SC}*	2.59 A
Voltage at mpp V_{mpp}*	61.9 V
Current at mpp I_{mpp}*	2.34 A
Max. over-current protection I_R	4.0 A
Max. system voltage V_{sys} (IEC)	1000 V

Insolation intensity 1000 W/m² in the plane of the module, module temperature 25 °C and a spectral distribution of the sunlight according to the atmospheric mass (AM) 1.5.

* Manufacturing tolerance: -5 %/+10 %

Data measured at nominal module temperature (NMOT)** and AM 1.5:

PowerMax® SKALA	145
NMOT	40 °C
Nominal power P_{nom}	109 W
Open-circuit voltage V_{OC}	76 V
Short-circuit current I_{SC}	2.07 A
Voltage at mpp V_{mpp}	58 V

** NMOT: Module operating temperature at 800 W/m² insolation intensity in the plane of the module, air temperature 20 °C, wind speed 1 m/s and open-circuit condition.

Temperature coefficients:

PowerMax® SKALA	Value
Temperature coefficient P_{nom}	-0.39 %/°C
Temperature coefficient V_{OC}	-230 mV/°C
Temperature coefficient I_{SC}	0 mA/°C

Data measured at low light intensity:

The relative reduction in the module efficiency at a light intensity of 200 W/m² relative to 1000 W/m² at 25 °C module temperature and spectrum AM 1.5 is 6 %. At 500 W/m² the relative improvement in module efficiency is +1 %.

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