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StoVentec ARTline

Photovoltaics for energy generation on facades

Today, aspects of sustainability and energy efficiency are as much a part of future-oriented planning as a solid architectural concept.

Photovoltaic technology has so far mainly been used on roofs for energy generation. Sto are now introducing photovoltaics for walls as well. With StoVentec ARTline, we offer two sophisticated systems for regenerative facade solutions with aesthetic appeal.
On the one hand, approx. 40 per cent of energy can be saved by facade insulation this way. On the other hand, the facade itself generates energy – up to 700 kWh per kWp (peak) each year.

Power behind the glass facade

StoVentec ARTline Invisible

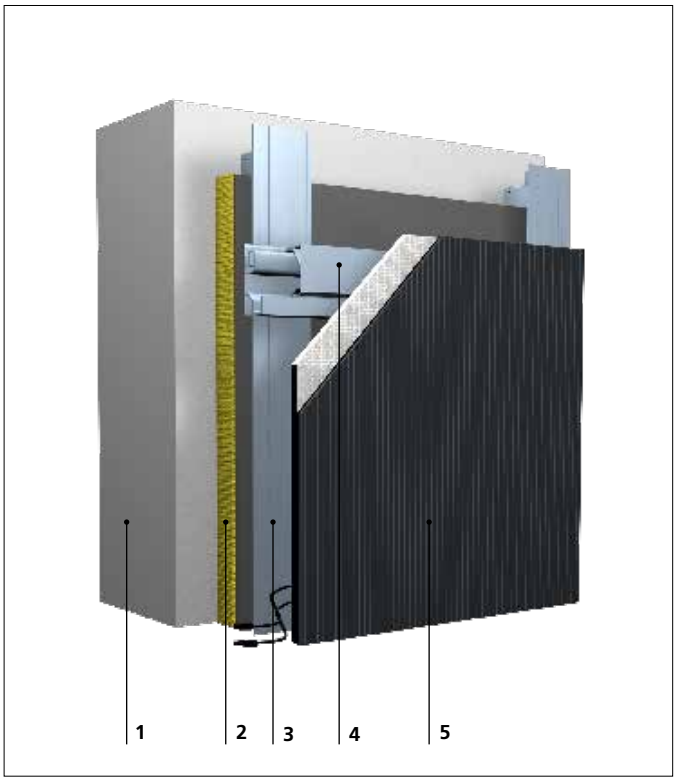
The StoVentec ARTline Invisible ventilated rainscreen cladding system is the perfect combination of innovative energy generation and aesthetic appeal. With integrated insulation and ready-to-install photovoltaic panels, the system offers the ideal form of solar energy generation. The invisible fixing provides a uniform, high-grade appearance. The electricity is generated by photovoltaic panels with a size of 1200 x 600 mm which are supplied to the construction site ready for installation. They can be installed horizontally or vertically and the rim zone can be supplemented with glass panels in matching colours.

The panels consist of an ultra-lightweight solar module, manufactured using thin-film technology (CIS), which is adhered to the proven StoVentec Carrier Board. Agraffe profiles on the back side are used to attach the panels to the sub-construction. The result is an attractive, multi-functional building envelope which uses solar energy to generate electricity.

The electric power of the panels can be monitored continuously – over the internet or through an external partner.

Benefits and advantages

- Continuous glass facade with invisible fixing
- Energy generation per square metre: up to 75 kWh per year
- Energy saving thanks to integrated facade insulation
- Fast installation in all weather conditions thanks to prefabricated panels



1 Anchorage substrate
2 Thermal insulation (fleece-laminated)
3 Sub-construction
4 Agraffe profiles
5 StoVentec ARTline Invisible Panel

Clever combination: StoVentec ARTline Invisible can also be implemented with coloured PV panels, integrated into a rendered EWIS facade as shown here. Glass panels in customised formats and colours can provide additional feature accents.

University of Erfurt, DE-Erfurt
Architecture office: AIG Gotha GmbH, DE-Gotha

Energy from a wall
StoVentec ARTline Inlay

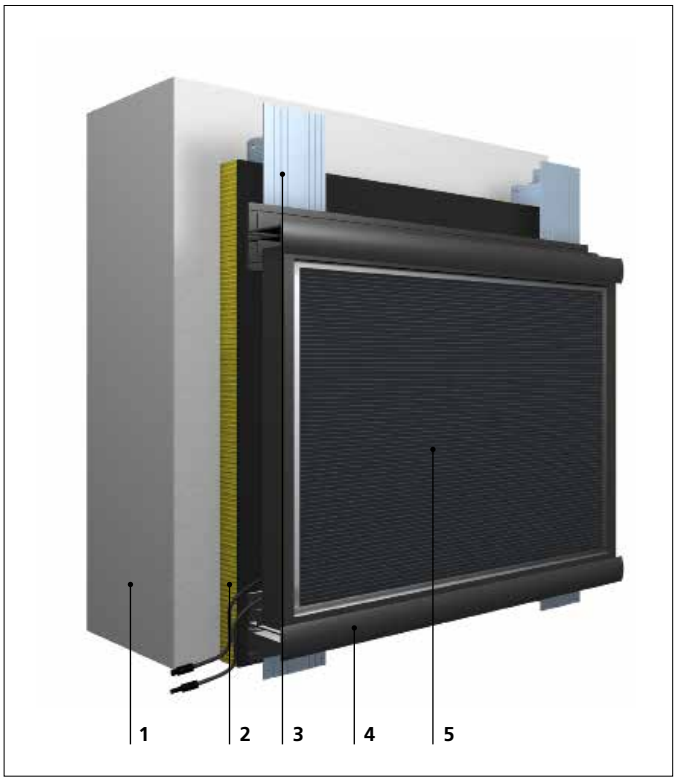
In the ventilated rainscreen system StoVentec ARTline Inlay, the word "inlay" stands for the framed photovoltaic panels which are used for generating power. These are inserted into black rails which are then screw-fixed to the sub-construction of the system. The panels with a size of 1205 x 605 mm are suitable for horizontal or vertical installation. Their electric power can be continuously monitored over the internet or through an external partner. They are available in black and other colour variants or with customised printing.

Benefits and advantages

- Facade with individual, high-quality appearance through framed photovoltaic panels
- Energy generation per square metre: up to 75 kWh per year
- Energy saving thanks to integrated facade insulation
- Fast installation in all weather conditions thanks to prefabricated panels

Kilowatt peak (kWp) and kilowatt hours (kWh)

Kilowatt peak (kWp) represents the peak performance that a photovoltaic system reaches under standardised conditions. This value is determined under standard conditions (radiation strength = 1,000 W/m², cell temperature = 25 °C etc.)
The actual electricity output of a photovoltaic system is measured in kilowatt hours (kWh). The StoVentec ARTline Panels, for example, reach an annual output of up to 75 kWh per m².
For comparison: a family of four has an annual energy requirement of approx. 4,500 kWh. This means that 60 m² of StoVentec ARTline facade can satisfy this demand.



1 Anchorage substrate
2 Thermal insulation (fleece-laminated)
3 Sub-construction
4 Support rail
5 StoVentec ARTline Inlay Panel

The StoVentec ARTline Inlay Panels can be individually printed, e.g. with a company logo.

Kaco New Energy, DE-Neckarsulm
SCHLEIFENHEIMER architekten, DE-Coburg

Image: Ulrich Schwarz, Berlin
Further references at vhf.sto.de

The future of living

Effizienzhaus Plus, DE-Berlin

An energy surplus house that provides enough energy for a family of four, charges the electric vehicles, and feeds any excess energy into the public supply network: the "Effizienzhaus Plus" is a research object of the German Federal Ministry of Transport, Building, and Urban Development and it is a milestone for the next generation of living.

"Sustainable buildings have to be brilliant and breathtakingly beautiful." Architect Werner Sobek combines minimalist architectural design with a visionary photovoltaic energy concept. He chose StoVentec ARTline Invisible to make his vision of tomorrow's intelligent building technology a reality. The PV panels can be placed on a stainless steel/aluminium sub-construction or, as in this case, on a timber sub-construction to completely envelop the building. This makes them an independent building element of the facade envelope while they additionally act as weather and thermal protection. The fixing at the back side of the panels is invisible from the front. This produces a homogeneous black glass facade which generates energy invisibly.

Project:
Effizienzhaus Plus,
DE-Berlin
Architects:
Werner Sobek
Engineering & Design,
DE-Stuttgart
Building owner:
Federal Ministry of Transport, Building, and Urban Development,
DE-Berlin
Sto expertise:
Ventilated rainscreen cladding system (StoVentec ARTline Invisible)

Image: BMVBS

Building data
- System: StoVentec ARTline Invisible
- Approx. 110 PV panels
- Dimensions: 1200 x 600 mm
- Surface area: 80 m²
- Output: 8 kWp
- Completion: December 2011

The house, the fuel station: The "Effizienzhaus Plus" remotely charges the electric vehicles using induction technology.

Solar energy supply
Rheinvorlandspeicher, DE-Mannheim

The former emergency granary was not used after the end of the Cold War and had therefore been empty since the early 1980s. Today, "Speicher7" houses offices, a hotel, and restaurants directly on the banks of the river Rhine. To be more precise, at the main landing place of the cruise ships where around 75,000 tourist disembark each year. The revitalisation of the old granary also included extensive energy efficiency measures which had to preserve the industrial appearance as much as possible. A StoVentec ARTline Inlay ventilated rainscreen cladding facade was therefore installed on some parts of the 3,000 m² steel envelope of Speicher7.

The photovoltaic panels of the 18 cm thin thermal insulation supply the historic granary with solar energy while giving it an appearance which blends in with the port environment The photovoltaic system integrated into the facade supplies power to the heat pump for the heating and cooling systems of the walls and floors. The required water is drawn from two wells and then routed back into the Rhine through the former water level structure.

Project:
Rheinvorlandspeicher, DE-Mannheim
Architect:
Schmucker und Partner, DE-Mannheim
Building owner:
Rhein-Kai-Speicher GmbH, DE-Mannheim
Tradesmen:
AS Fassaden GmbH, DE-Gars (Inn)
Sto expertise:
Ventilated rainscreen cladding system (StoVentec ARTline Inlay)

Building data:
- System: StoVentec ARTline Inlay
- Approx. 854 PV panels
- Dimensions: 1205 x 605 mm
- Surface area: 680 m²
- Output: 64 kWp
- Completion: April 2013

The dark photovoltaic panels from StoVentec ARTline Inlay constitute the visual focus of the building.

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