

THE REVOLUTION HAS BEGUN

 **coversun**
solar roofing system
by Cappello Alluminio



www.coversun.it

THE ALUMINUM ROOFING SYSTEM ON
Y-BEAMS FOR THE INTEGRATION OF
PHOTOVOLTAIC PANELS.

TOTAL ARCHITECTURAL INTEGRATION
MAXIMUM ECONOMIC EFFICIENCY.



Made in Italy



COVERSUN REVOLUTION

In recent years, the photovoltaic industry has produced innovative solutions oriented towards architectural integration and harmonization in the built environment.

These solutions derive from the need to improve the energy efficiency of buildings and to reduce the emission of pollutants into the atmosphere.

The results are of undisputed esthetic significance, with the objective of ensuring the greatest possible efficiency of the photovoltaic plant.

Increasing attention to the environment and focus on more sustainable use of resources are the foundations of the "energy culture" which Cappello Group subscribes to. **COVERSUN** represents a new concept in the field of energy production that combines innovative technological performance with architectural advances.





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solar roofing system

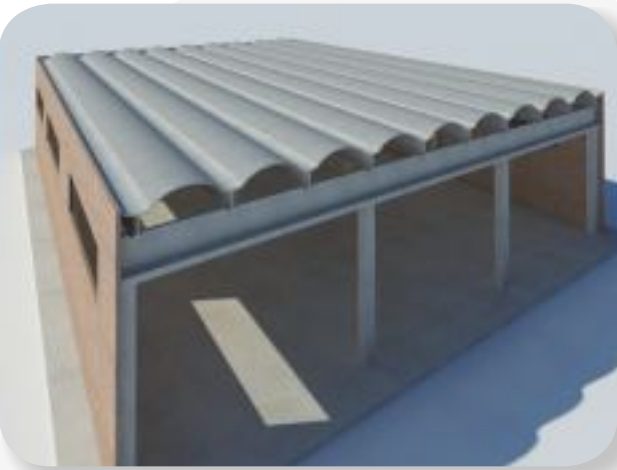
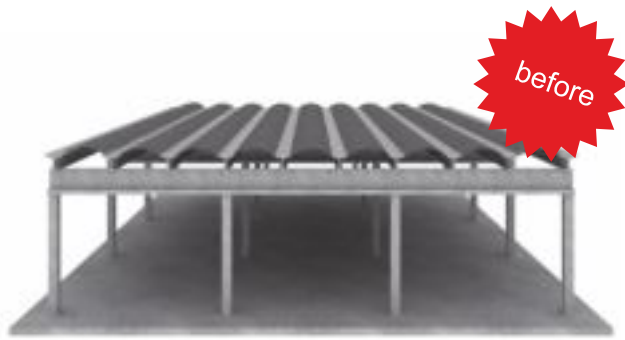


Coversun is a patented modular roofing system built with aluminum and steel sections capable of fully integrating **Micron** photovoltaic modules in industrial, commercial, and artisanal buildings constructed with prefabricated elements and with special Y-type prestressed reinforced concrete beams.

Coversun's goal is to manufacture modular roofing, offering diversified features that encourage its adoption both for the replacement of roofs on already existing industrial buildings and for the construction of new buildings.



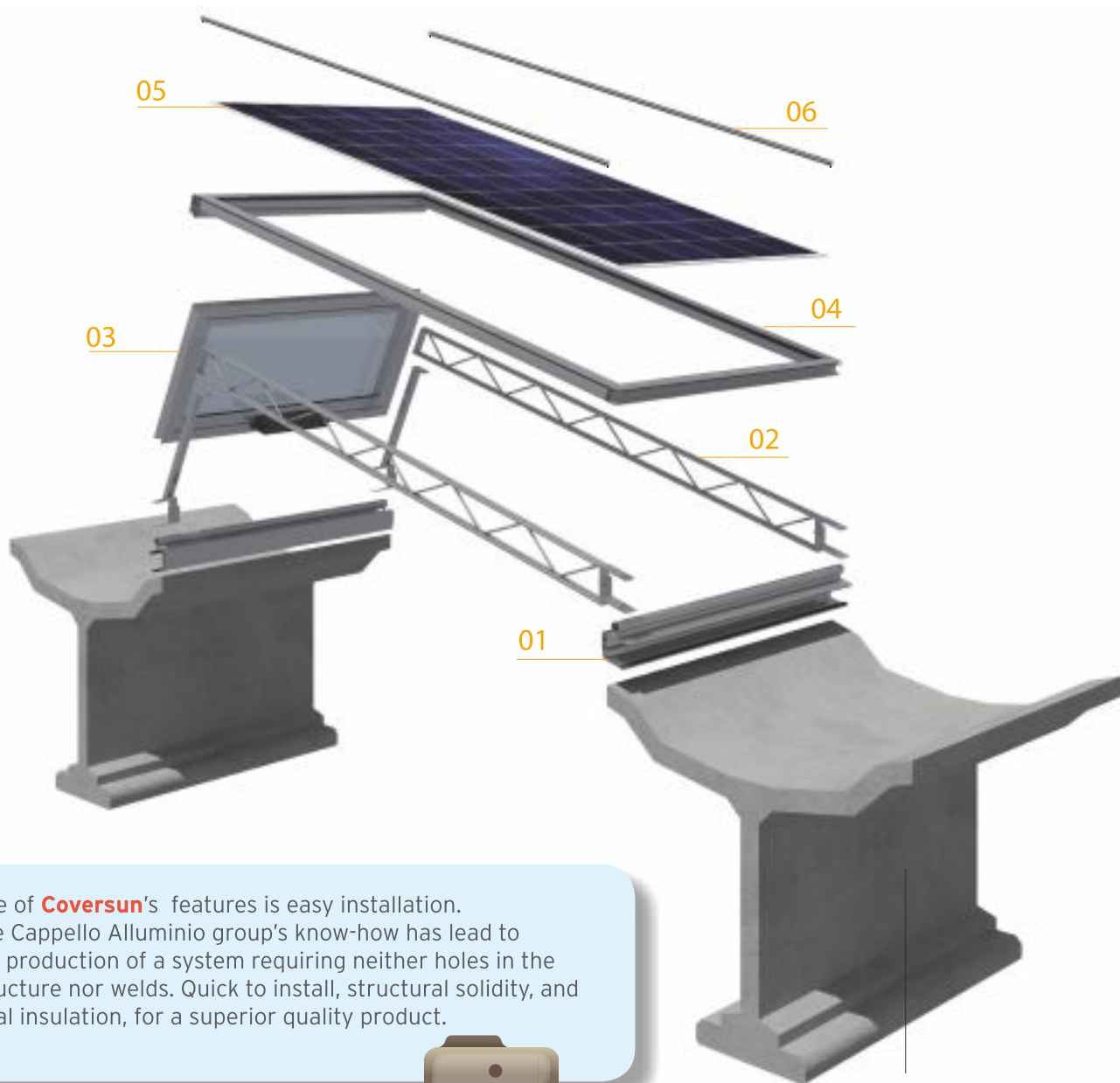
An industrial loft building before and after installation of **Coversun**



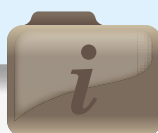
This system is suitable for existing bays of any structure and size.

Coversun is capable of producing energy while at the same time protecting against atmospheric agents thanks to its purposely innovative system of aluminum sections and hermetically sealed gaskets, specially designed and manufactured by a highly qualified technical staff, thanks to the **Cappello Alluminio industrial group's** more than forty years of experience in the window and door frames sector of the building industry.

THE COVERSUN MODULE



One of **Coversun's** features is easy installation. The Cappello Alluminio group's know-how has led to the production of a system requiring neither holes in the structure nor welds. Quick to install, structural solidity, and total insulation, for a superior quality product.

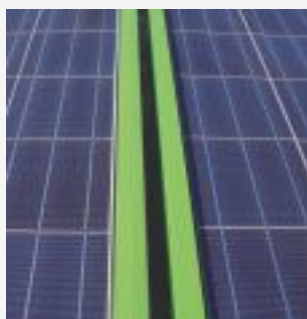


prestressed reinforced concrete Y-beam (or similar)



KEY

- 01** Clamp-on frame-guide sections, pre-painted aluminum **Coversun** structure.
- 02** Hot-galvanized metal trestlework substructure, pre-painted with thermosetting polyester powder.
- 03** Framed glass side window with pre-painted aluminum **Coversun** structure (fixed or movable/motorized).
- 04** Pre-painted aluminum **Coversun** structure frame for housing photovoltaic panels.
- 05** Micron photovoltaic panel.
- 06** Central water-tight thermal-barrier coupling seal.



Coversun installs photovoltaic panels





coversun TH THERMIC

solar roofing system

COVERSUN's thermoregulation reduces the energy consumption of a building and eliminates problems related to the production of condensation – essentially improving the building's “energy performance”. Coversun-Th system may be installed as a fully-functional roof in its own right, giving our clients the option to install our photovoltaic panels at a later date.

COVERSUN replaces the original roof with a insulated and lightweight cover, that provides good lighting and ventilation.

The possibility of installing a photovoltaic system after the installation of the structure allows our clients to spread their investment over a period of time. Since the **Coversun-Th** system may be installed as a fully-functional roof in its own right, our clients can opt to install our photovoltaic panels at a later date.

The Coversun-Th system regulates the thermal functions of industrial and commercial buildings.

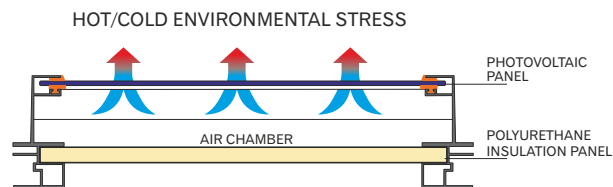
Coversun-Th insulated solar cover.

Guarantees thermal insulation thanks to a system of aluminum plates sandwiched in polyurethane, framed in extruded, 6060 aluminum-alloy, which can either be coated with thermosetting polyester powder or anodized.

Coversun-Th solar cover **offers both aesthetics and robustness. It is particularly suitable for insulated covers for industrial use.**

Different color-options.

Coversun-Th is designed to combine insulating functionality, thermal adjustment, and photovoltaic energy production, all in one integrated system.



Sketch of coversun-th ventilated roof

The Coversun-Th system is composed of an outer sheet and an inner sheet with an interior layer of polyurethane rigid foam, thus providing ideal insulation. 10% of the polyurethane rigid foam, consists of a resin with high insulating properties and total density of 40 kg / m³.

- Application areas: agricultural, industrial and replacement and small domes.
- Mounting: horizontal and vertical.
- Fixing: partly hidden and partly visible.
- Insulation element: polyurethane.

Advantages

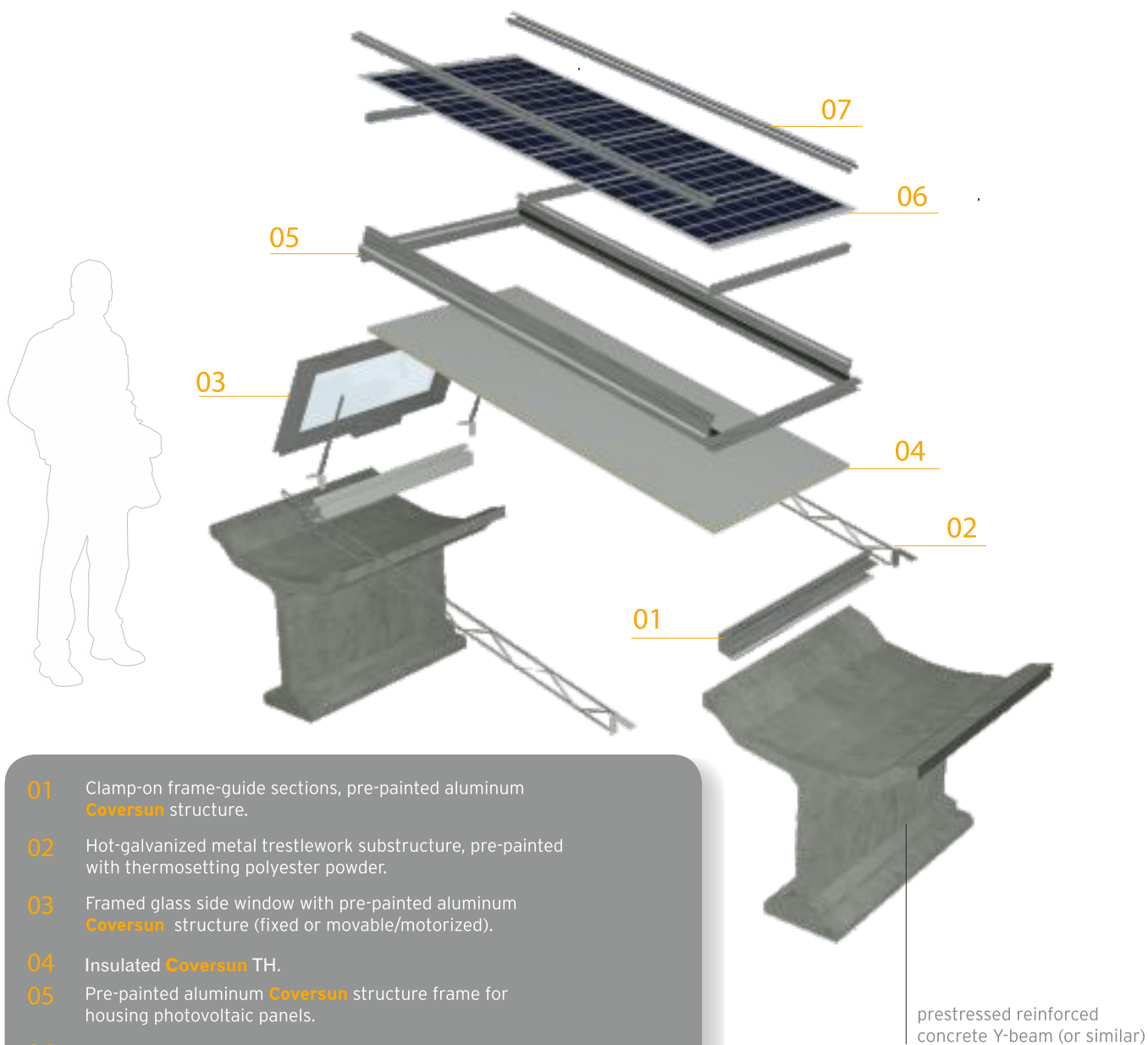
The Coversun-Th system is a very economically viable alternative which guarantees high thermal insulation, air- and water-proofing.

Strengths

- High functionality
- High strength
- High thermal insulation
- High waterproofing
- Ideal for the replacement of asbestos in domes and shells.

Cappello Alluminio is a leader in the field of industrial photovoltaic roofs with innovative features, dedicated to offering solutions for industrial buildings made with Y- or similar beams.

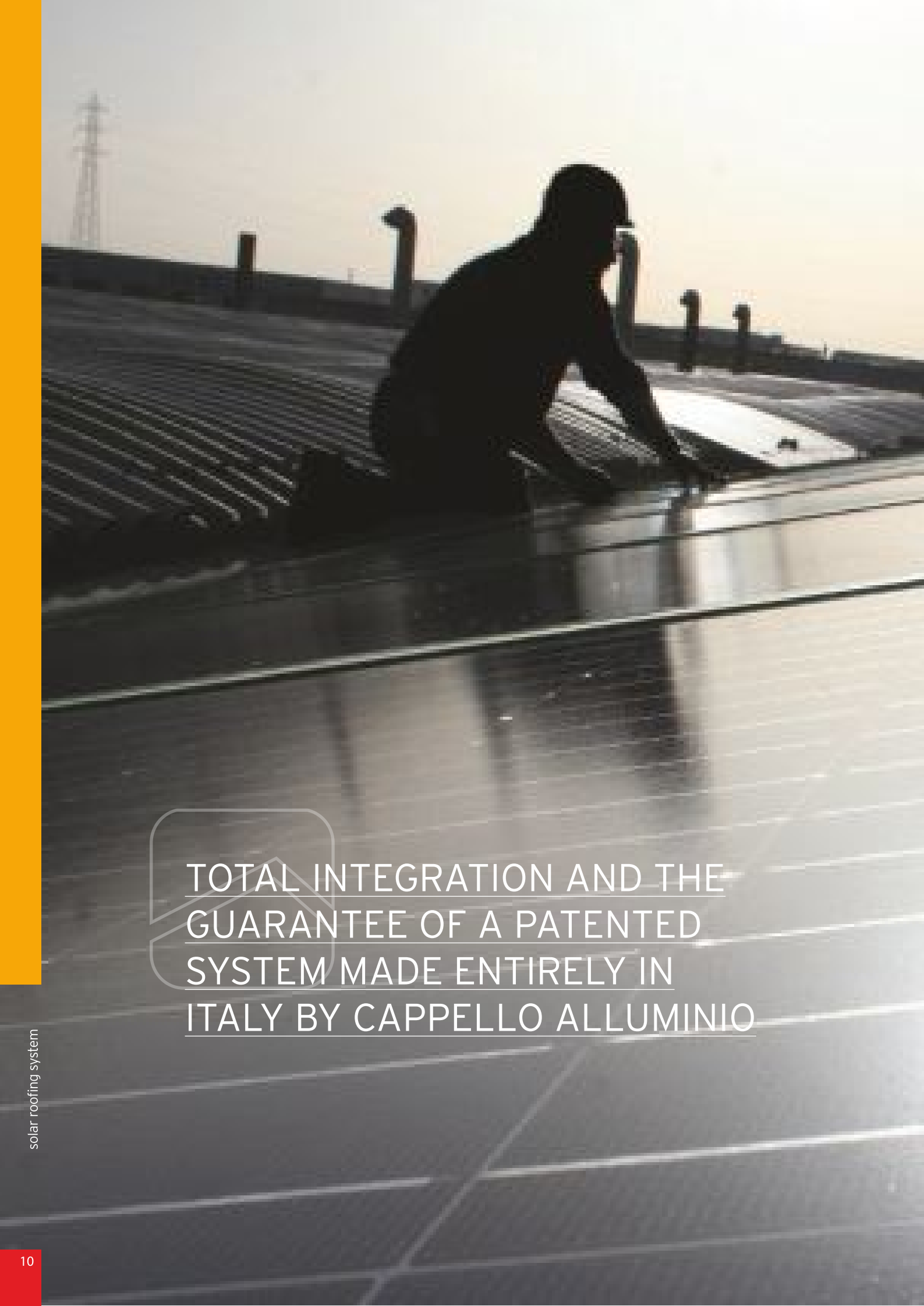
COVERSUN TH WILL
KEEP YOUR FACILITIES
COOL IN SUMMER AND
WARM IN WINTER



KEY

- 01 Clamp-on frame-guide sections, pre-painted aluminum **Coversun** structure.
- 02 Hot-galvanized metal trestlework substructure, pre-painted with thermosetting polyester powder.
- 03 Framed glass side window with pre-painted aluminum **Coversun** structure (fixed or movable/motorized).
- 04 Insulated **Coversun** TH.
- 05 Pre-painted aluminum **Coversun** structure frame for housing photovoltaic panels.
- 06 Micron photovoltaic panel.
- 07 Central water-tight thermal-barrier coupling seal.

prestressed reinforced concrete Y-beam (or similar)



TOTAL INTEGRATION AND THE
GUARANTEE OF A PATENTED
SYSTEM MADE ENTIRELY IN
ITALY BY CAPPELLO ALLUMINIO

INNOVATION AND HIGH ECONOMIC EFFICIENCY WITH COVERSUN

Even today, the problem of restoring certain types of roofing for industrial buildings made with asbestos panels or panels composed of other materials detrimental to health is particularly felt.

Restoration work up to now has been limited to the replacement of above-mentioned materials with alternative solutions involving considerable expense for companies.

Coversun is an innovative and revolutionary solution that can fill the need for an effective and eco-compatible industrial roofing which is at the same time efficacious in terms of economics, capable of generating significant economic efficiencies.



The roofs of new industrial constructions or existing buildings no longer need to be expensive, passive elements. **Coversun** offers both functionality and comfort. It is designed as an innovative and direct instrument of energy production to satisfy businesses' increasing demand for self-sufficiency.



LUMINOSITY AND GREATER AERATION IN ROOMS

Coversun guarantees luminosity and ventilation in rooms thanks to its special motorized aperture system.

Guarantees proofing against water, air and wind, in full compliance with **PR EN 15601, the European Standard** for waterproofing abilities of the underlying structure. It guarantees brightness and ventilation thanks to its special motorized opening system and the mechanical seal of the construction elements which it replaces.

The ventilation, furthermore, allows the operating temperature of the photovoltaic plant to be lowered, resulting in greater efficiency for the plant itself.

A LIGHT LOAD ON THE ROOF, INSTALLATION WITHOUT HOLES AND WELDS

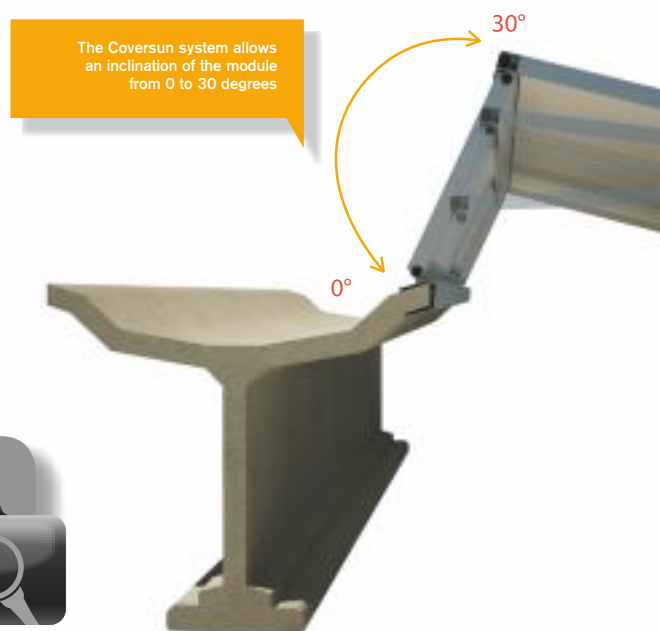
Coversun systems are easy to install and guarantee greater structural solidity by way of the light load on the roof and the lack of any holes and welds which can alter the load bearing system of roofs.

Furthermore, as regards structural solidity, **Coversun** can withstand any additional loads due to special climatic conditions such as snow, wind, possible seismic events, etc.

The methods and procedures adopted to size the support structures are those indicated in the Italian Ministerial Decree dated January 14, 2008 "Technical Regulations for Buildings."



The Coversun system allows an inclination of the module from 0 to 30 degrees





DESIGN AND CAPABILITY

Coversun's very high quality extruded-aluminum structure, together with the efficiency of the **Micron** photovoltaic modules produced by **Cappello Alluminio** are also reflected in their elegant and functional design, having a harmonious effect on the assembly, that can be fully integrated with the architectural needs of modern structures whether they be residential buildings, industrial plants, or commercial facilities.

With **Coversun**, the cables and the electrical parts of the photovoltaic plant are located inside the building, guaranteeing simple, safe, and functional maintenance.

The ends of the bays are closed with special-purpose sheet-metal gables pre-painted with thermosetting polyester powder.




Made in Italy

Coversun is a patented system Made in Italy with **high-quality** products.

QUICK AND PRACTICAL MAINTENANCE

Coversun solves maintenance operations (washing and cleaning photovoltaic glass) in absolute safety and with the utmost convenience, offering the possibility for special gangways to be built to cross the roof beams.

These are built, along the entire span of the Y-beams, with anti-slip, 3 mm thick hot-galvanized steel floor plate, allowing a clearance of approximately 600 mm for pedestrians.

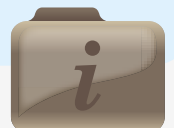
Like for the rest of the entire system, no holes or wells are required in the prefabricated structure to mount the gangway either.

SAFE MAINTENANCE THROUGHOUT THE YEARS

Protecting the safety and health of maintenance workers is, along with product serviceability, one of the priorities we have set in producing the system.



For this reason, a lifeline system that guarantees a safe fall-arrest, specially designed for the structures onto which it will be mounted, may be installed on demand.





COVERSUN RELIABILITY

The minimum average life of a photovoltaic plant is approximately 25/30 years, for this reason we studied the system with our customers in mind. Each element has been thoroughly tested in our factories to guarantee durability, solidity, reliability, easy installation, and easy maintenance.



Rapid installation, guaranteed strength.

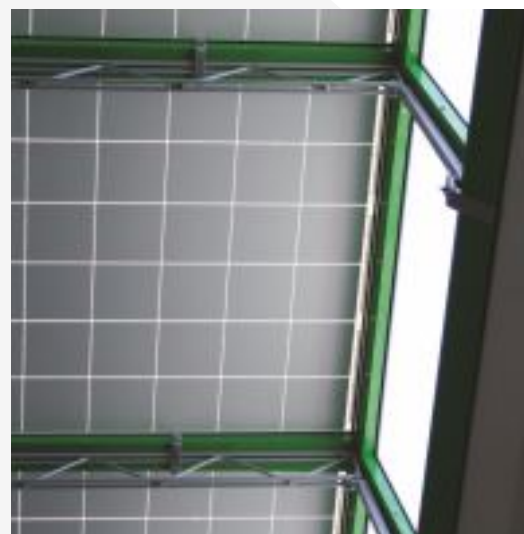
The **Coversun** system is made of 6060-alloy extruded aluminum sections, with extra support, a hot-galvanized metal trestlework substructure prepainted with thermosetting polyester powder.

Once installed, the photovoltaic plant can be connected immediately, only requiring electrical connections to the special equipment.

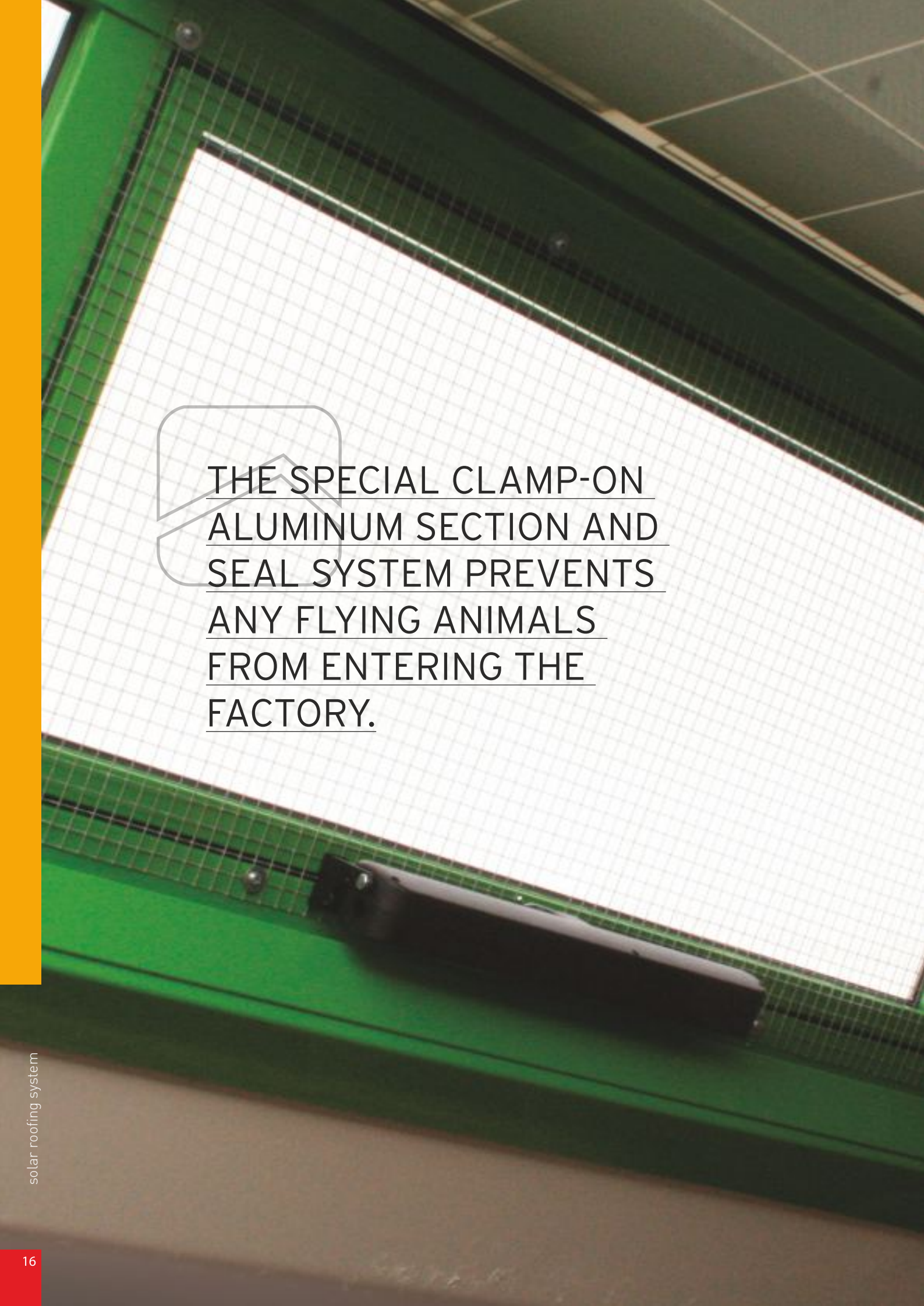
A new look for your structures

Coversun changes the interior and exterior appearance of the buildings on which it is installed:

- More livable interiors
- The luminosity of the rooms, guaranteed by the expansive windows and by the white square-textured background reproduced on the back of the Micron photovoltaic modules;
- An attractive esthetic impact, thanks to the large assortment of colors that can be applied to the aluminum structure.



solar roofing system



THE SPECIAL CLAMP-ON
ALUMINUM SECTION AND
SEAL SYSTEM PREVENTS
ANY FLYING ANIMALS
FROM ENTERING THE
FACTORY.



STOP BIRDS AT THE ENTRANCE TO THE FACTORIES

Birds entering facilities is one of the frequent problems encountered in industrial buildings.

When designing **Coversun**, particular attention was paid to the problem which was effectively and definitively resolved.

The special clamp-on aluminum section and seal system, positioned along the Y-beams of the building, necessary to anchor the **Coversun** structure, prevents any flying animals from entering the factory.

The clamp-on frame system, also eliminates current bird-protection systems used with the traditional curved corrugated or ribbed fiber cement or asbestos cement roofing.

It is instead possible to place special metal nets in the motorized ventilation windows to prevent flying animals and foreign bodies originating from outdoors from entering.

This special characteristic makes **Coversun** the best product especially for food industry facilities where maintaining an uncontaminated environment is of fundamental importance.



COVERSUN SIMPLE TO INSTALL

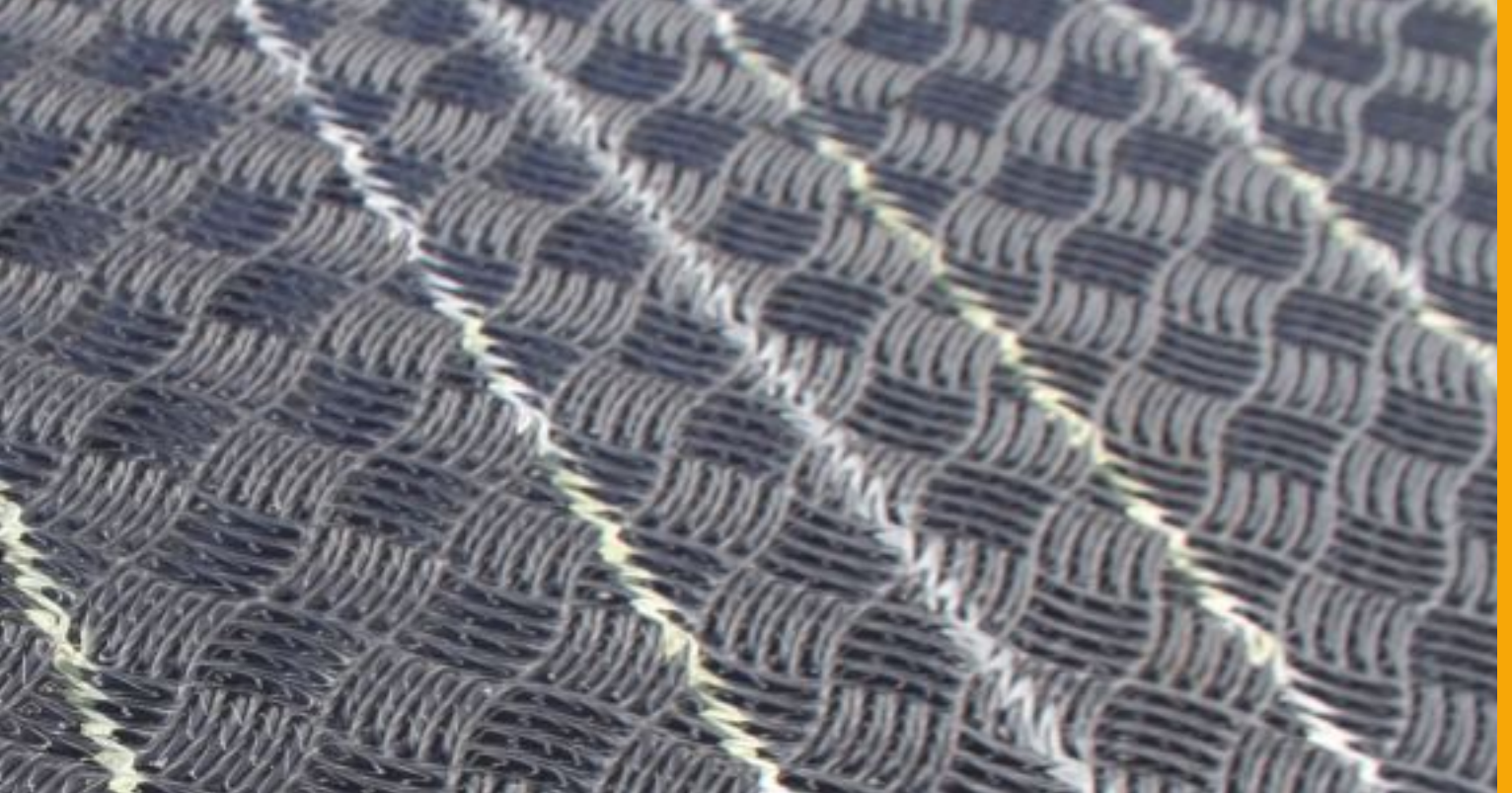
The 10 steps to install



01

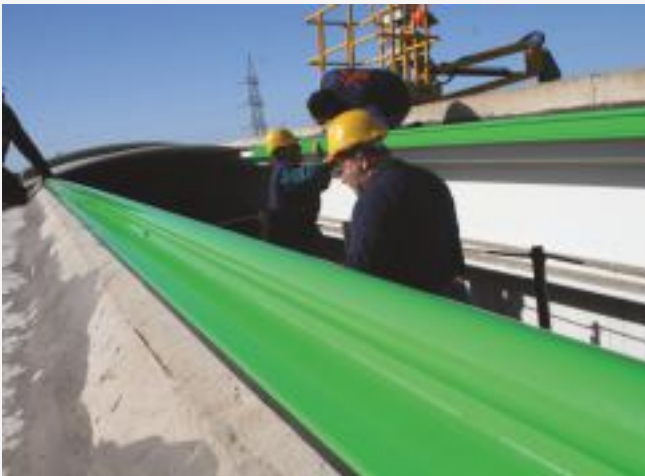
removal of existing curved fiber cement, asbestos cement, or sheet metal roofing





02

installation of the clamp-on guiding frame along the 2 flanges of the Y-beams (or similar beams) of the bays to be covered



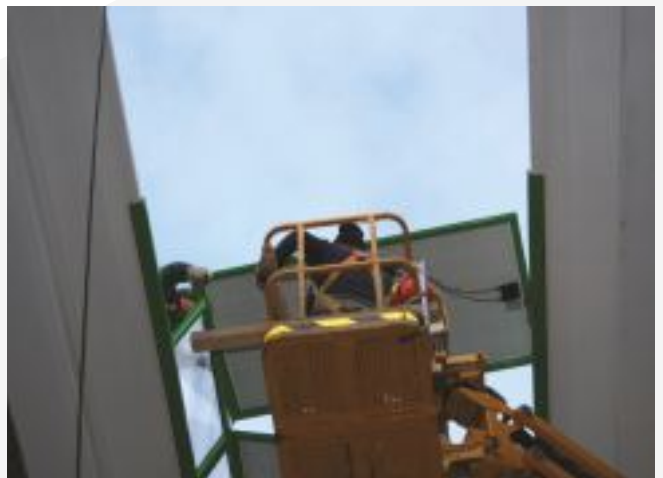
03

installation of glass side window
(Fixed or movable/motorized)



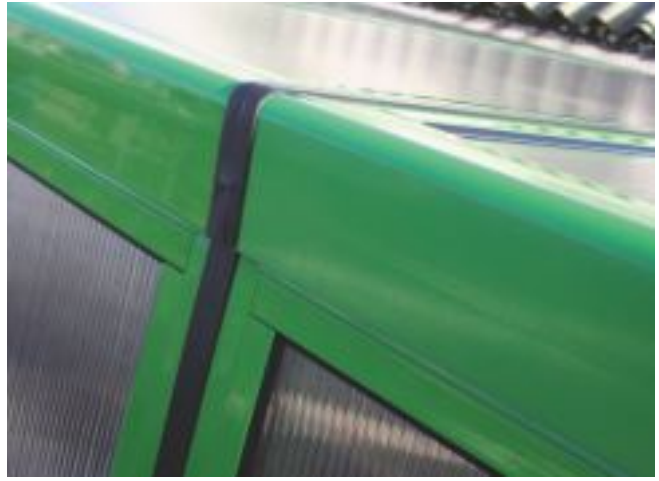
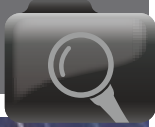
04

installation of the **Micron** photovoltaic
module framed on the **Coversun** system



05

installation of central water-tight and thermal barrier seals



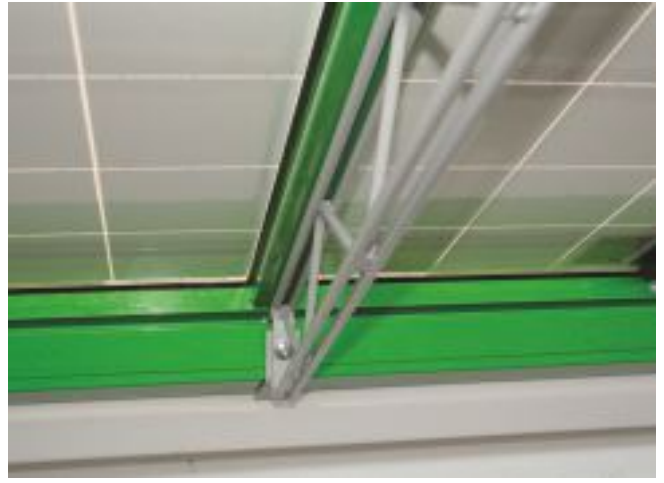
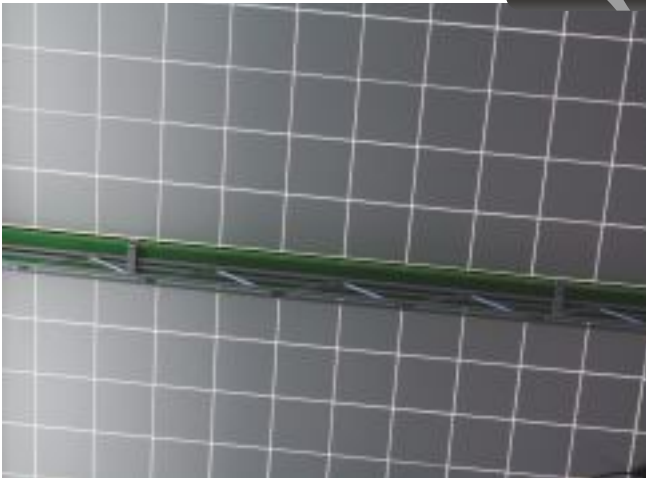
06

connection of the photovoltaic module
Junction box connections



07

installation of the trestlework substructure and fastening connections between **Coversun** modules



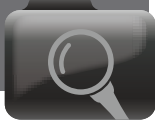
08

installation of pedestrian catwalk for maintenance



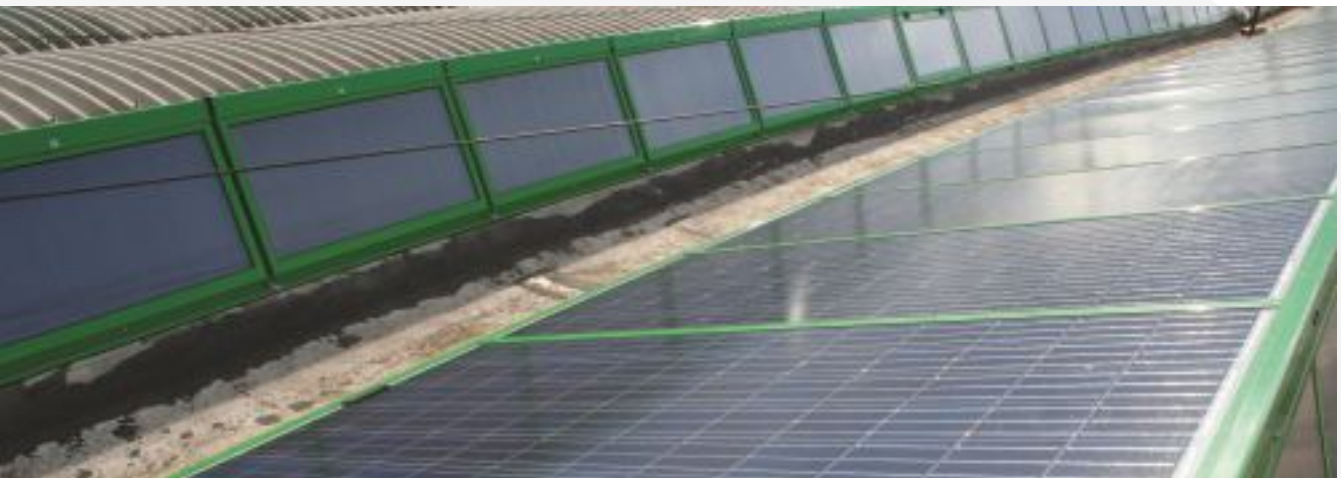
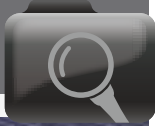
09

final sealing



10

installation of the side gables



WHY COVERSUN

Prefabricated cement loft buildings, with Y-section or similar beams, have technical specifications that render the application of photovoltaic plants with traditional mono- and polycrystalline silicon modules difficult because of the following factors:

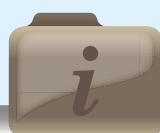
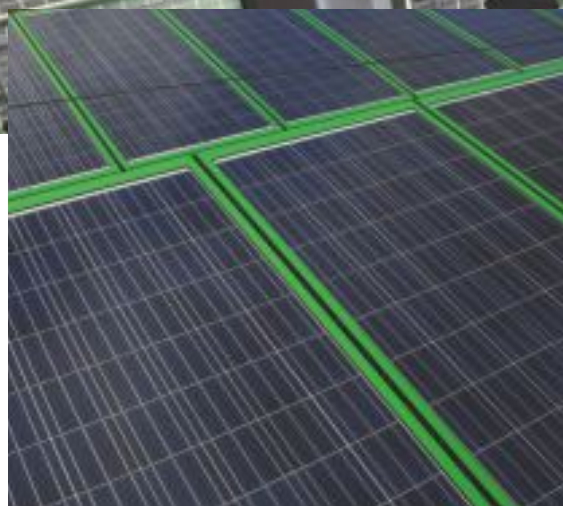
- limited or potentially unstable anchoring to the prefabricated beams;
- small excess loads allowed on the structure;
- problems of rain-water infiltration, caused by the installation (with holes) on precarious structures on preexisting roofs;
- architectural integration not acknowledged by the GSE [the National Electrical Services Operator].

Coversun definitively resolves the problem of securing photovoltaic plants onto the roofs of the industrial buildings and allows simple and reliable operations on these structures.

With **Coversun**, the photovoltaic module becomes a roof, thus guaranteeing the total architectural integration for the purpose of acknowledgment of the maximum subsidized rates on the part of the GSE.

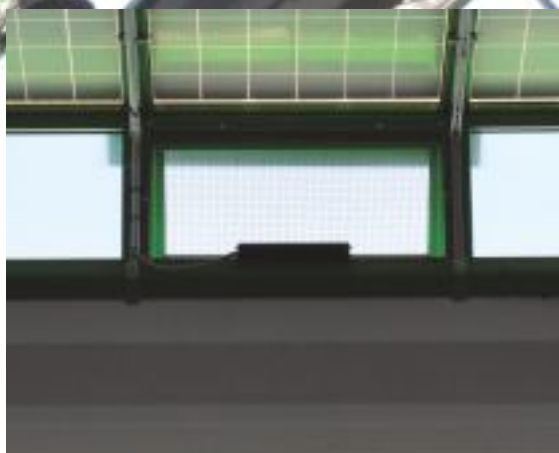
The exclusive, patented “clamp-on” system allows **Coversun** to be secured onto Y-beam, installing the photovoltaic plant with total architectural integration on this type of prefabricated reinforced concrete structure also.

Any type of photovoltaic module may be installed on **Coversun**, whether mono- and polycrystalline (54-60 and 72 6"-cells), or thin film types (CIGS, CdTe, amorphous silicon or CSG).





Coversun does not limit the dimension of the photovoltaic roof modules.



COVERSUN does not limit the dimension of the photovoltaic roof modules.

The measurements and the inclination are compensated by the expanse of the windows which in any case is determined by the module characteristics and the optimal inclination of the panels.

The architectural integration of the photovoltaic plant, on the **Coversun** structure, adds esthetic value to buildings and facilitates utilization of the roof, without the traditional metal framework which in any case are invasive for walking on the roof.



COVERSUN HAS REVOLUTIONIZED THE MARKET WITH A ROOF SYSTEM THAT IS FULLY IMPERMEABLE AND PHOTOVOLTAIC BOTH AT THE SAME TIME.

IT ALLOWS THE PRODUCTION OF GREEN ENERGY WITH HIGH PERFORMANCE BOTH ON NEWLY-BUILT ROOFS AND ON RECONVERTED ROOFS.

COVERSUN BLOCKS ATMOSPHERIC AGENTS, IT CAPTURES SOLAR ENERGY, WITH THE GREATEST ECONOMIC EFFICIENCIES ACHIEVABLE, DERIVING FROM THE GOVERNMENT PHOTOVOLTAIC POWER INCENTIVE, CONTO ENERGIA.



REFERENCE TECHNICAL AND REGULATORY PARAMETERS

This paragraph presents a brief description of the static system used for the **Coversun** system's load-bearing steel structure conceived with a trestlework typology.

Coversun is a fully integrated roofing system, composed of 1991x990 mm photovoltaic panels framed by a system of purposely designed aluminum sections, resting entirely on special-matching self-bearing steel structures installed over a span equivalent to the short side of the photovoltaic panels (approximately 1 m).

The aluminum sections and steel structure interact both at points where the Coversun system bears down on the prefabricated reinforced concrete loft-building beams and on the side along the panels, guaranteeing a sturdy clamp between the elements and the best possible seal against atmospheric agents.

The coupling between the aluminum and steel is achieved via an aluminum channel fit onto the flanges of the prefabricated beams along their entire length, thus guaranteeing optimal load distribution; the steel load-bearing beams clamp onto these channels via a system of bent profiles and clamping bolts.

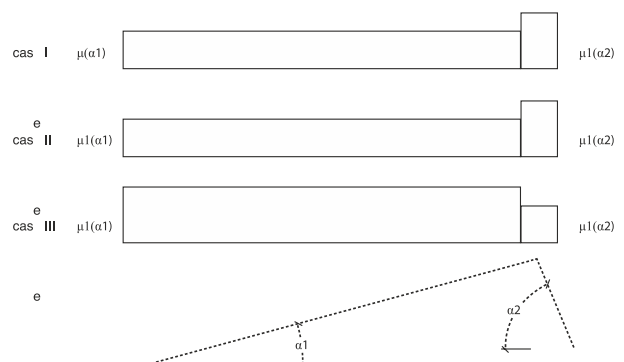
The Reference Technical Regulations used for load analysis and to verify the structural elements is:

“New Technical regulations for Buildings” - Ministerial Decree Jan 14, 2008.

In case of existing structures, where the Coversun System replaces classical curving fiber-cement roof elements, only non-structural roof elements are involved, therefore it is fulfill the provisions of paragraph 8.4.3 of the aforesaid Code, this intervention being considered a local repair or intervention, thus performing structural analysis only for the newly installed components.

The load analysis regards:

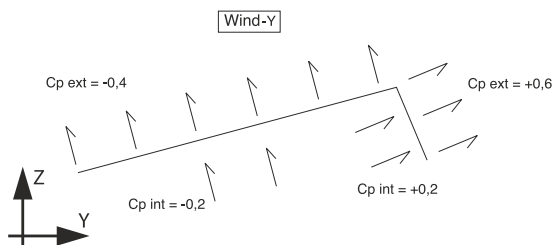
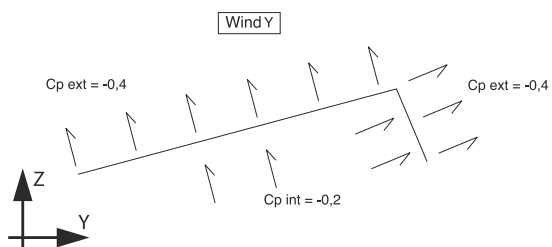
- Permanent loads (own weights of the photovoltaic panels and of the supporting aluminum sections);
- Variable working loads (roofing accessible only for maintenance);
- The snow loads, categorized by the slopes of the roof system, are classified as snow loads without wind (“case I”) and snow loads with wind (the worst case condition between “Case II” and case “Case III”).





The loads caused by the wind, require an estimate of the shape factors in order to evaluate whether pressure or vacuum phenomena are present.

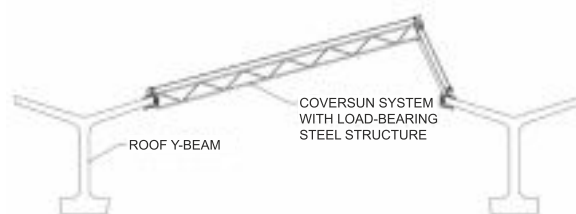
A typical situation is illustrated for example:



All the actions inferred from the load analysis will be converted into linear loads acting on the load-bearing steel structure to be verified.

In situations where existing roofing is to be replaced, the lightness of the system is such that normally, the comparison between preexisting roof loads and those that exist when installation is complete, do not necessitate complex reverification of the reinforced-concrete load-bearing structures.

Furthermore, in such instances, the increase of the masses present on the structure being negligible, structural analysis may be made under non-seismic conditions, verifying the degree of safety only of the new structures to be installed.





COVERSUN HAS REVOLUTIONIZED
THE MARKET WITH ITS TOTALLY
IMPERMEABLE, AND AT THE SAME
TIME, PHOTOVOLTAIC ROOFING
SYSTEM.



www.coversun.it



brand.hgo.it



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europa

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