

# Bioclimatic Facades Inspiration Book







## The bioclimatic facade from all angles

With the invention of reinforced concrete and the post and beam system, the facade strengthened and reinforced its structural role. Its functions (load-bearing structure, insulation, waterproofing, appearance, finish, ornament) could be separated and detached, giving unprecedented freedom to architects.

The facade has been able to adapt to all principles and all intentions without direct interaction on the basic structure of the building.

Beginning in the 1920s, American architect Buckminster Fuller used the application of materials in the form of modular panels. Working directly with a manufacturer, German architect and structural engineer, Frei Otto, improved his technical knowledge and tested various types of structures (framed, tensile) for applications which were, until then, impossible with traditional materials.

For more than 30 years, Serge Ferrari has worked in close cooperation with experts and leaders in the construction industry. With a commitment to innovation, research, modeling experimentation, technical assistance and customer service, Serge Ferrari encourages the emergence of new solutions suited to current market challenges.

Choosing Serge Ferrari composite membranes for a building means opting for:

- improved performance
- contributing to occupant well-being (visual and heat comfort)
- providing a visual identity
- reducing the carbon footprint.

Explore the beauty and performance of facade solutions in the pages that follow. Through the diversity of their intended use, the systems implemented, the aesthetic and functional choices, these facades are a gateway to discovery.





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# Yeni Sakarya Atatürk Stadyumu Stadium

Sakarya (Turkey)

## A symbol of renewal in a town affected by seismic activity

Situated in the north part of town, the Sakarya Stadium is a symbol of reconstruction and renewal in the face of numerous earthquakes, which have impacted the region. Mandated by the Turkish agency Toki, the construction of this vast elliptical arena began in 2012 using plans designed by Alper Aksoy Architects. Built in compliance with new seismic standards, this building hosts numerous national and international sporting events, features multiple ticket offices, and includes shops and restaurants. With a total floor area of 41,500 m<sup>2</sup> (446,702 sq. ft.), the Sakarya Stadium can host up to 29,000 people and serves as a shelter in the event of a natural catastrophe.

The company Tensaform, which has significant experience in the implementation of membranes for tensile architecture, installed 40,000 m<sup>2</sup> (430,556 sq. ft.) of Flexlight Xtrem TX30-IV to cover the roof. Tensaform also selected Frontside View 381 to dress the stadium's facade. Manufactured using Serge Ferrari's patented Précontraint technology, this flexible composite membrane has the advantage of "not deforming irrespective of the weather conditions, which is a considerable advantage in a region where the temperatures are extremely variable," emphasized Alper Askoy's firm director.

According to Burç Esker, manager of Serge Ferrari Turkey, "The Frontside View 381 membrane protects against the sun's rays and against weather conditions and natural hazards. Whilst it contributes to advances in energy solutions, it also offers numerous possibilities for personalization (printing, 3D effects, etc.)."

The Frontside View 381 is adorned with tricolor lozenges – white, green and black – custom made for this project to reflect the colors of the town's football club: Sakaryaspor.



Freeform facade | *Personalized tension system*



*"The composite membrane protects the interior from the sun's rays. It also offers numerous possibilities in terms of personalization."*





*"Protection from the sun is provided by taut canvasses, which adapt perfectly to the curves of the facade and offer the user a completely unobstructed direct and peripheral view."*

# Wings Campus Head Office of Airbus Group

Blagnac (France)

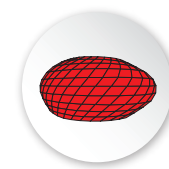
## Transparency at the heart of architectural intention

In 2012, Tom Enders, Chairman of the Airbus Group, decided to move the head offices of the company to Toulouse Blagnac, a symbolic site which saw the birth of European aeronautics. Once the location was selected, regional architecture firms were invited to submit designs for the new office as part of a competition. Enders' requirements were specific: no imposing or ostentatious architecture but rather an American-style campus, open and functional to encourage staff creativity as well as environmentally-friendly, satisfying the most demanding requirements in terms of sustainable development.

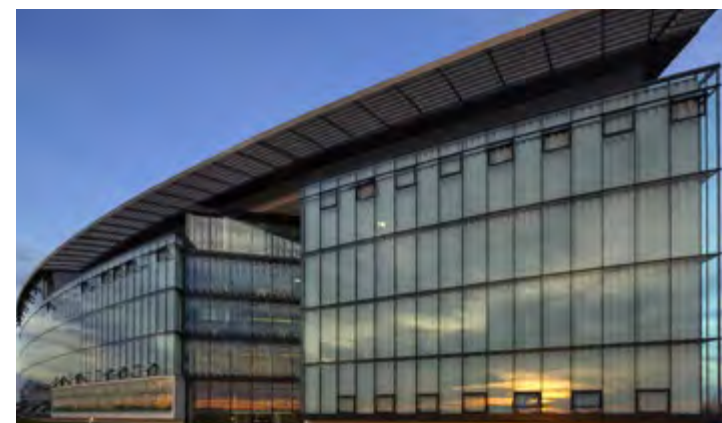
Toulouse-based architecture firm, Calvo Tran Van won the competition and proposed a development around a park – a genuine center of gravity serving four office buildings and numerous departments dedicated to staff well-being. The initial sketches showed how playing with lines and perspectives could give the building a wing shape, which gave the campus its name. The recurrence of combinations of materials/structures – post and beam systems in concrete, glass facade combining taut canvasses, aluminum cladding – confirm its name.

"The head office building stands out with its glass double-facade integrating vertical fixed elements in Frontside View 381," explains Luc Tran Van, chairman of the firm. "The glass walls enveloping it accomplish the feeling of 'crossing' from the site entrance to the runways situated behind. The dual skin which perfectly fulfills its role of acoustic and heat protection allowed us to introduce a play of reflections."

Van Tran continues, "The sun protection is provided by taut canvasses which adapt well to the curves of the facade and offer the user a completely unobstructed direct and peripheral view. These vertical fixed bands of taut canvas, which represent a real choice, also address a necessity, the proximity of the airport imposing specific criteria regarding the materials used. Certain radio navigation systems, such as ILS (Instrument Landing System) can be disrupted by a compact material such as metal!"



Freeform facade | *Personalized tension system*





# Rice University Car Park

Houston, Texas (USA)

## Printing use for integration into the landscape

In 2015, Rice University in Houston brought on Philadelphia-based architecture firm, KieranTimberlake, to design a, administrative building and multi-story parking structure for a new campus entrance. The facilities, which would be located within an area surrounded by evergreen oaks, cedar trees and longstanding campus buildings, required perfect integration with the existing environment. “We had to find a way to carefully position this major structure within the current background of the campus,” said David Hinchey, associate with KieranTimberlake.

Hinchey and his team also wanted to ensure the garage “function within the distinctive landscape and extend a legacy of thoughtful planning” at the university. The design team’s solution was to create a facade around the parking structure made up of Serge Ferrari’s Frontside View 381 composite membrane. Combining flexibility and resistance, the membrane was stretched between trapezoidal panels to not only increase visual interest, but also break up the garages’ scale and introduce breaks in the facade to ensure interior ventilation. In addition, the composite membrane facade provides a protective screen, optimizing heat transfer and reducing light pollution caused by cars and interior lighting.

“Distancing the panels from the exterior structure and varying their positions provided the desired equilibrium. This not only enabled the facade to be livened up by the crossing of light and shadow, but also minimized the scale of the building while providing ventilation,” Hinchey explained.

Kieran Timberlake particularly took advantage of the graphic customizations options offered by Frontside View 381. The fabric itself was printed with a fig vine pattern – a plant species commonly found around the campus and the region – which was screen printed on the membrane using a UV ink process. The architect was able to link the facade to the vegetation of the site due to the drop shadow created with clusters of leaves recreated on the edges of the panels. Installed on a structure composed of sheathed steel tubes, the panels reached the campus tree tops. Their various orientations give an impression of movement, which completes the architectural intention making the parking garage an extension – both bold and subtle– of the regional flora and fauna.

This durable, long-lasting facade is also flexible over time. The panels can easily be replaced to modify their graphics with no need to renovate the building structure.



Facade frame | *Tensioned system with aluminum profiles*



“Distancing the panels from the exterior structure and varying their disposition led to the desired equilibrium. This not only enabled the facade to be livened up by the crossing of light and shadow, but also minimized the scale of the building while ventilating the interior of the car park.”





"The personalization of the Frontside View 381 composite membrane recalls the intellectual function of the place."

# La Passerelle Media Library

La Tour-du-Pin (France)

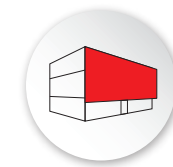
## Support projects that boost our territories

Opened in 2016, la Passerelle – a media library located in the town center of Tour-du-Pin, France – connects a childcare service and an activities room within a single building. This building brings together a variety of audiences for local services and to emphasize that, Thierry Rampillon, architect and co-founder of CR&ON Architects, chose to give this application a local flavor.

The choice to add local essence is primarily seen in the materials and the application. The wooden frame is spruce and the larch siding is certified Bois des Alpes [certification of locally-sourced wood]. Additionally, the interior covering is based on earth plastering from the region. The facade is covered with Serge Ferrari's Frontside View 381 composite membrane manufactured, which was manufactured in the immediate vicinity of the site. The installation and fitting were also entrusted to a local partner, the company Hureau.

On the exterior, the Frontside View 381 composite membrane is printed with cuneiform symbols, echoing the oldest alphabet ever discovered to recall the intellectual function of the premises.

Energy savings via compliance with the RT 2012, the validation of the lease sectors, and the short circuits of the local economy further enable the building to be supported by the Grand Projet Rhône-Alpes (GPRA) [Major Rhône-Alpes Project].



Monolithic facade | *Tension system with aluminum profiles*





# Silver Spur Sotheby's Realty Offices

Palos Verdes, California (USA)

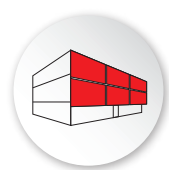
## Combining heat and visual comfort with energy efficiency

Built in 1963, Silverspur is a 30,000 square-foot commercial building that houses the offices of luxury estate agent, Sotheby's International Realty (SIR). The mid-century modern building features numerous windows, which were causing a loss of energy due to the need for excessive HVAC usage. To reduce its energy bill, owners decided to renovate the building. California-based XTEN Architecture was hired to redesign and renovate the project during the 2000s. The firm's experience in the use of composite membranes for covering facades led it to recommend a solution using the composite membranes of Serge Ferrari to the managers of SIR.

Serge Ferrari's Frontside Print 371 was installed on the facade of the building and was a welcome improvement from the occupants of the building. XTEN Architecture sought to modernize the facade and played with the angles and direction of the membrane to give the building a unique architectural signature. Due to its perforations, Frontside Print 371 reflects 80 percent of the sun's rays while permitting the transmission of natural light to the interior of the building. The view from the inside to the exterior remains entirely preserved. The membrane's micro-perforated structure is stretched on frames, which are fixed on concrete slabs.

"Previously, we had to use blinds to protect us from the heat and light. Thanks to the facade coverage with the Frontside Print 371, the heat no longer penetrates the building and we benefit from natural light without being blinded by it, which enables us to reduce our lighting costs," said Rick Elder, co-director of SIR. The company has made energy savings of close to \$60,000 per year.

In addition, Frontside Print 371 alters the appearance of the building throughout the day depending on the position of the sun. It becomes successively opaque (indirect light), translucent (oblique rays), and transparent at night revealing the framework and internal structure of the building. The visual change not only gives a touch of modernity to the building, but also enhances the well-being and comfort of its occupants.



Facade frame | *Tension system with aluminum profiles*



*"Thanks to covering the facade with the Frontside Print 371, the heat no longer penetrates the building, but we benefit from natural light without being blinded by it, which enabled us to reduce our lighting costs."*





*“Occupants are smiling again and appreciate the comfort provided during the warm days in September and October.”*

# Institut National Polytechnique Administrative building

Toulouse (France)

## A bioclimatic facade for improved quality of life at work

Constructed in 2002, the building of the chairman of the Institut National Polytechnique (INP) in Toulouse is home to various administrative departments of the university. The glazed facade faces south, and while windows were equipped with Venetian blinds in the double glazing, neighboring offices were exposed to extremely high temperatures. Netting was originally selected to cover the facade, but was not installed due to cost. However, its absence was felt as temperatures in the summer can exceed 89°F in the offices and the use of air condition was not sufficient. In 2017, the INP asked architectural firm, Calvo Van Tran, to offer a solution able to efficiently reduce the high temperatures in the offices while preserving the existing offices.

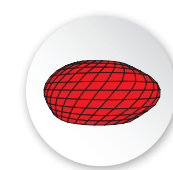
Jacques Calvo recommended the use of a bioclimatic facade, specifically Frontside View 381, as a sunscreen. “A visit to the cafeteria at the new Airbus head office in Toulouse, which uses the same technical solution, allowed us to discover this Serge Ferrari product. We were pleasantly surprised by the fact that the composite membrane preserves visibility on the exterior,” explained Jacques Azam, real estate Manager of INP, who served as principal contractor.

In parallel, F4 Ingénierie carried out a Dynamic Thermal Simulation for a theoretical assessment of the energy savings of the solution.

The company Lahille, a member of the Serge Ferrari expert network, completed the design, fabrication, and installation.

“In the center of the facade, a metallic structure supports the fabric which is stretched on incoming and outgoing ledges, at approximately 30 feet high. To produce this alternation required a mixed system of installation, combining shotgun-shaped profiles and tension bar system. The structure not only serves as the passageway for technical access and creates a buffer zone, which helps to limit the greenhouse effect, but the membrane itself also filters the sun’s rays. In addition to the heat comfort this ensures, the facade has the form of saw teeth which gives the building architectural cachet,” noted Lionel Reynié, director of Lahille.

According to Azam, “Occupants are smiling again and appreciate the comfort provided during the warm days in September and October.”



Free-form facade | Tension bar system





# Markant Theatre

Uden (the Netherlands)

## When the facade lights up and invites people to the show

After three years of renovation, the Markant Theatre in Uden, the Netherlands literally gained a new skin. In addition to the existing theater, the renovated building, which opened in 2013, houses a large event hall able to accommodate 1,100 people, a restaurant, and four versatile rooms for various functions: auditorium, party room, cinema, etc. "This makes for a consistent complex with its own identities," noted Architectuurstudio, the firm responsible for the project design.

The central hall also serves as a theater for a variety of programs such as pop concerts, exhibitions, dance performances, carnivals, dinners, galas, and more. Thanks to the application of a bioclimatic facade, each event is able to have original staging. The facade is made up of two Frontside View 381 composite membranes stretched on aluminum frames, which conceal a multi-colored lighting system installed by the company 3TAC. The micro-perforation of the membranes allows for lights to be hung while cleverly hiding the LEDs.

The combination of Serge Ferrari solutions and innovative lighting allows for the energy costs of the building to be managed. A genuine support for ambient lighting, the bioclimatic facade contributes to the transparency and luminosity of the premises thanks to its perforations. The floor of the central foyer, situated nearly 5-feet below road level, is itself a sight to see.



Monolithic facade | Tension system with shotgun barrels



*"Thanks to its transparency, the composite membrane facade is a support for ambient lighting and helps with the luminosity of the premises."*







# Gotha Cosmetics Head Office

Lallio (Italy)

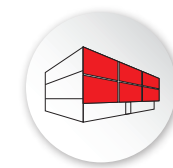
## A facade combining light and modernism

For the renovation and extension of its head office in Lallio, Gotha Cosmetics secured Italian architecture and design firm, iarchitects. The project was born from Gotha Cosmetics' desire for new areas fitting for the renewal of the brand, involving the extension of the office floor area, the modernization of the production zone, and the layout of the main entrance.

"The design consisted of a representative building [made from] an industrial material with strong connotations, which separates the area dedicated to visitors of the operational area," explained Pietro Perego, architect for the project.

The new building envelope features a fully glazed exterior facade with Serge Ferari's Frontside View 381 composite membrane, which gives the building a contemporary aesthetic and regulates ambient light. "The building complies with the strictest environmental and energy standards thanks to the combined effect of the insulation and the composite membrane facade, which helps protect the building from the sun's rays," said Perego.

Frontside View 381 also provides a volume continuity between the offices and the manufacturing area, playing with the effect of changing natural light in addition to the integration of low consumption LEDs. "The idea of a dialogue of transparency and colors led to the creation of a project combining creativity and production. The facade therefore becomes the principal support for a mixture of both natural and artificial light," concluded Perego.



Facade frame | *Tension system with aluminum profiles*

**"The idea of the dialogue of transparency and colors led to the creation of a masterpiece combining creativity and production. These transition effects were possible thanks to mixing natural and artificial light, for which the facade is the principal factor."**





# Tech2, Head office of Techquadrat

Marchtrenk (Austria)

## A luminous monolithic facade



Monolithic facade | *Tension system with aluminum profiles*





# Restaurant B55 - Wings Campus Airbus Group

Toulouse – Blagnac (France)

## Profit from the perspective

Situated at the center of the Airbus Wings Campus is the two-story building designed for various functions including a ground-floor cafeteria, a first-floor restaurant, a fitness center and a concierge service. While its location and range of services make it a focal point for the group's 1,500 employees, the site and the equipment necessary for operation should meld with the overall architectural design. To accomplish this involved transferring this central zone – both the delivery flows and the technical areas (the latter being underground and accessible from a courtyard on the exterior of the site).

To avoid any obstruction of perspective, architecture firm Calvo Van Tran decided to extend the building upwards, bringing the restaurant to the level of the tree canopy. Two facades are equipped with a double skin made up of a glass wall and a three-dimensional structure covered with Frontside View 381 composite membrane.

"This micro-perforated fabric, which has the specific feature of deflecting the sun's rays, gives an opaque aspect seen from the exterior that visually disappears from the interior. This combines the protection expected from a sun screen and the visual comfort sought on the interior", explained the architect, adding, "The two facades are in rhythm due to a three-dimensional geometric pattern that provides a leafy effect. When the trees have reached their adult size, they will blend harmoniously with the ambient plant decor."



Facade frame | *Tension system with aluminum profiles*



"The micro-perforated material enables the visual contact with the exterior environment to be retained."





“This solution integrating the flexible composite membrane satisfies the criteria of likeness, and cost, whilst providing a long-lasting solution for the building.”

# Carré Léon Gaumont Cultural Center

Sainte-Maxime (France)

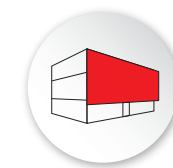
## A long-lasting identity

Constructed in 2008 in Sainte-Maxime, the Carré Léon Gaumont Cultural Center is approximately 56,000 square-feet and features a reception, media library, an event room, three cinemas, offices and a cafeteria. Due to its location at the entry to Sainte-Maxime and wide-range of functions, designer Jean-Pascal Clément wanted to build a strong and long-lasting relationship with the town through communicating architecture.

This large parallel is 242 feet long, 190 feet wide and 53 feet high and features three glazed facades, with the fourth backing to a cliff. The three facades have a steel structure that support three large panels of Frontside View 381. The composite membrane facade solution was preferable to a metallic chain facade to meeting weight and cost criteria. Frontside View 381 also offers the possibility of graphic personalization by screen printing patterns on the panels.

Ten years after its installation, the composite membrane tension remained thanks to Serge Ferrari's patented Précontraint technology which ensures dimensional stability. The cloud of words printed on the external side continues to confirm the sociocultural vocation of the building and the transparency of which is synonymous with openness and discovery.

“As it is designed, the square absorbs the cliffs, reflects them and restores them. The immediate environment is not obscured,” said Clément.



Monolithic facade | *Tension system with shotgun barrels*





# Why choose Frontside membranes?

## Resistance and durability

The patented Précontraint technology from Serge Ferrari consists of maintaining the biaxial tension throughout the manufacturing process. This unique process provides:

- superior mechanical resistance;
- exceptional durability;
- extreme smoothness, guaranteed during the installation and throughout the life of the product.

Frontside composite membranes satisfy all the requirements of safety standards in force for structures open to the public (classification B-s2, d0). Their minimum lifespan (20 years) is subject to a 10 year guarantee, which takes effect from the date of installation.

These composite membranes come from the Serge Ferrari portfolio, proven for over 30 years in the architecture and solar protection sectors.

## Economy and lightweight

The lightweight and the low material density of the composite membrane allow the construction systems to be reduced. A facade composed of a system and a composite membrane does not exceed 1.02 psf including the weight of the frame. This lightweight guarantees:

- rapid installation;
- reduced installation costs and site schedules.

The texture of these composite membranes and their surface varnish makes them less sensitive to external effects of aging (streaks, leaks) and environmental pollution.

## Versatility and flexibility

Frontside composite membranes combine perfectly with traditional construction materials (concrete, wood, glass, metal, aluminum), and adapt to all types of buildings whether new construction or renovation projects. Their flexibility and strength allow for significant versatility of layout and assembly:

- three-dimensional forms or large monolithic surfaces;
- full or partial covering;
- digital printing for graphic personalization;
- image projection for highlighting by plays of light.

These composite membranes are also a source of inspiration for all facade applications (offices, parking garages, cultural buildings, etc.)

## Visual and Heat Comfort

The use of an exterior micro-perforated composite membrane is the most effective method to block the sun's rays and remove the greenhouse effect. Therefore, a significant part of the heat is stopped before reaching the body of the building, windows or doors. This exterior sun protection offers users:

- a genuine heat comfort;
- a visual comfort due to reduced glare;
- more uniform interior temperature regulation;
- reduced use of HVAC.

Due to its perforated texture, natural light is filtered without being blocked, providing visual comfort whilst preserving exterior visibility.

## Energy Efficiency

Used on the facade, Frontside composite membranes contribute to the improvement of the energy performance of buildings. Acting as screen and as solar protection, they allow the energy requirements of the building to be limited by minimizing the use of the HVAC. They provide effective compliance with the standard RT2012.

All of these properties (comfort in summer, intelligent consumption, bioclimatic design, installation, etc.) satisfy the requirements of building certifications and actively contribute to compliance with environmental standards:

- RT 2012
- BREEAM
- Leed
- HQE

## Health and Environmental Challenges

Frontside composite membranes are part of a durable approach to construction.

Serge Ferrari has established a health and environmental profile S+ for each of its products. This assesses performance depending on its final application in accordance with four criteria compliant with ISO 14 021:

- health precaution;
- renewable content;
- environmental footprint;
- circular economy.

Life-cycle analyses are also available in accordance with standard ISO 14040/44.

The flexible composite membrane is an environmentally-responsible material.



# Principal tension systems applicable to bioclimatic facades

## Plates and Cables

Due to a technique from Tensile Architecture, the composite membrane is attached on metal plates, which are attached to the building structure.

These adjustable plates allow the composite membrane to be stretched between the different attachment points of the membrane to the facade.

Furthermore, these plates receive the cables – also adjustable – which enable the composite membrane to be stretched laterally.

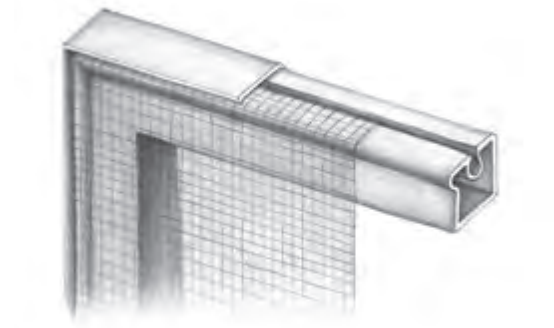


## Aluminum Profiles

The composite membrane is stretched around with aluminium profiles system.

A keder can be welded on the periphery of the composite membrane to be lodged and stretched in the channel of the profile. On other solutions, the composite membrane is stretched directly by a system of clamps or tap clips.

The profiles may be fixed to the wall to be covered. The composite membrane is then installed and stretched on site. Profiles can also be preassembled in the form of frames, which allows the composite membrane to be stretched in the workshop. The frames are then ready to be fitted like cassettes or panels.



## Tension bar

A metal tube is lodged in a sheath on the edges of the composite membrane.

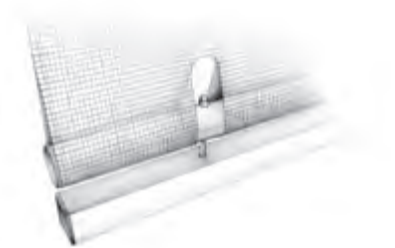
The tube is attached to the bearing structure using tension systems (threaded steel rods, springs) at the top and bottom.

## Shotgun profiles

A keder is welded on the periphery of the composite membrane to be fitted into the groove of the profile in the form of a shotgun barrel.

The composite membrane is stretched using screw spindles, attached to the structure of the building.

These two systems allow large surfaces of monolithic type facades to be covered.



## Peripheral lacing

The edges of the composite membrane are previously equipped with eyelets, tension is created by tightening a cord between the eyelets and the lacing supports.

The lacing can be visible or concealed. A halyard can be used in addition to double the cord.

This simple, versatile and economical system is perfectly suitable for canvases with curved edges.





# Why renovate a facade with Frontside membranes?

## Principal benefits

The advantage of renovating with Frontside composite membrane is both the speed and ease of installation, which impacts the overall cost of the project. Frontside composite membranes are able to be placed within the framework of light renovation, which does not involve the structure of the building itself or its shell.

Using Frontside as a genuine building envelope allows an overhaul of the visual and aesthetic identity of the project at a reasonable cost and within a short timeframe. On average, renovations of this kind take a few days. Depending on the type of construction, a number of implementations are possible.

The facade can be composed of panels pre-mounted in the factory then installed on site or formed as a single monolithic piece installed directly on site.

## Soltissim simulation tools

This tool simulates the energy report on buildings before and after the integration of facade products. Soltissim is designed to assist with decision making. The current database allows a large number of simulations to be covered depending on the following criteria: building type (schools, offices, hospitals), geographic location and weather conditions, percentage of the glazed surface within the structure, and quality of existing glazing.

The simulations and projections provided by Soltissim are made available to architects, engineering consultants or installers to show them the advantages of such a solution with regard to the energy performance of buildings. In certain cases, in warm regions in particular, energy savings may be upward of 75 percent.



The renovation of the hotel Oasis in Lanzarote (Canaries archipelago) with Frontside View 381 allowed the greenhouse effect to be limited by covering the major glazed surfaces across the building.

BEFORE



AFTER












A completely redesigned building, which is not only aesthetically pleasing, but also has improved occupant comfort due to the Frontside View 381 composite membrane.










# How do you choose a composite membrane?

## Choice guide

Bioclimatic facade							
I wish							
 Facade covering	Frontside View 381 Frontside Print 371	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside View 381	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside Safe P35
 Fixed sun breakers	Frontside View 381 Frontside Print 371	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside View 381	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside Safe P35
 Claddings for balconies	Frontside View 381 Frontside Print 371	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside View 381	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside Safe P35
 Claddings of technical units	Frontside View 381 Frontside Print 371	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside View 381	Frontside Print 371 Frontside View 381	Frontside View 381	Frontside Safe P35

### Je recherche

-  ... to protect from heat.
-  ... an ultra-strong material.
-  ... graphic customisation.
-  ... to promote natural light contribution and outward visibility.
-  ... to protect from glare and to ensure privacy.
-  ... a wide range of colours.
-  ... a non-combustible fire-resistant material.

## The Frontside range

### A facade solution combining creativity and performance

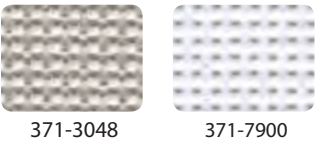
- **Heat and visual comfort**
  - Building heat regulation: blocks up to 80% of heat from the sun
  - Light management: allows light to enter while protecting against glare
- **Reduction of environmental impact**
  - Light bioclimatic facade
  - 100% recyclable

The colors and textures presented in this document are given as a guide only.

## Frontside Print 371

### The ideal solution for communications and graphic creation on facades

- **Graphic personalization**
  - Creative freedom (digital or screen printing)
  - Light and flexible materials
  - Longevity and dimensional stability thanks to Précontraint technology.



## Frontside View 381

### A unique solution for assert of modify the personality of a building:

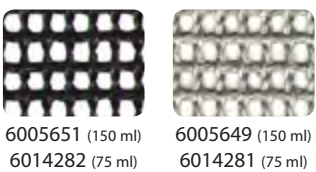
- **Unlimited creativity**
  - 17 pearlized or metallic colors
  - Flexibility of materials to “animate” facades and play on highlights
  - Graphic personalization (digital or screen printing on the reverse side)



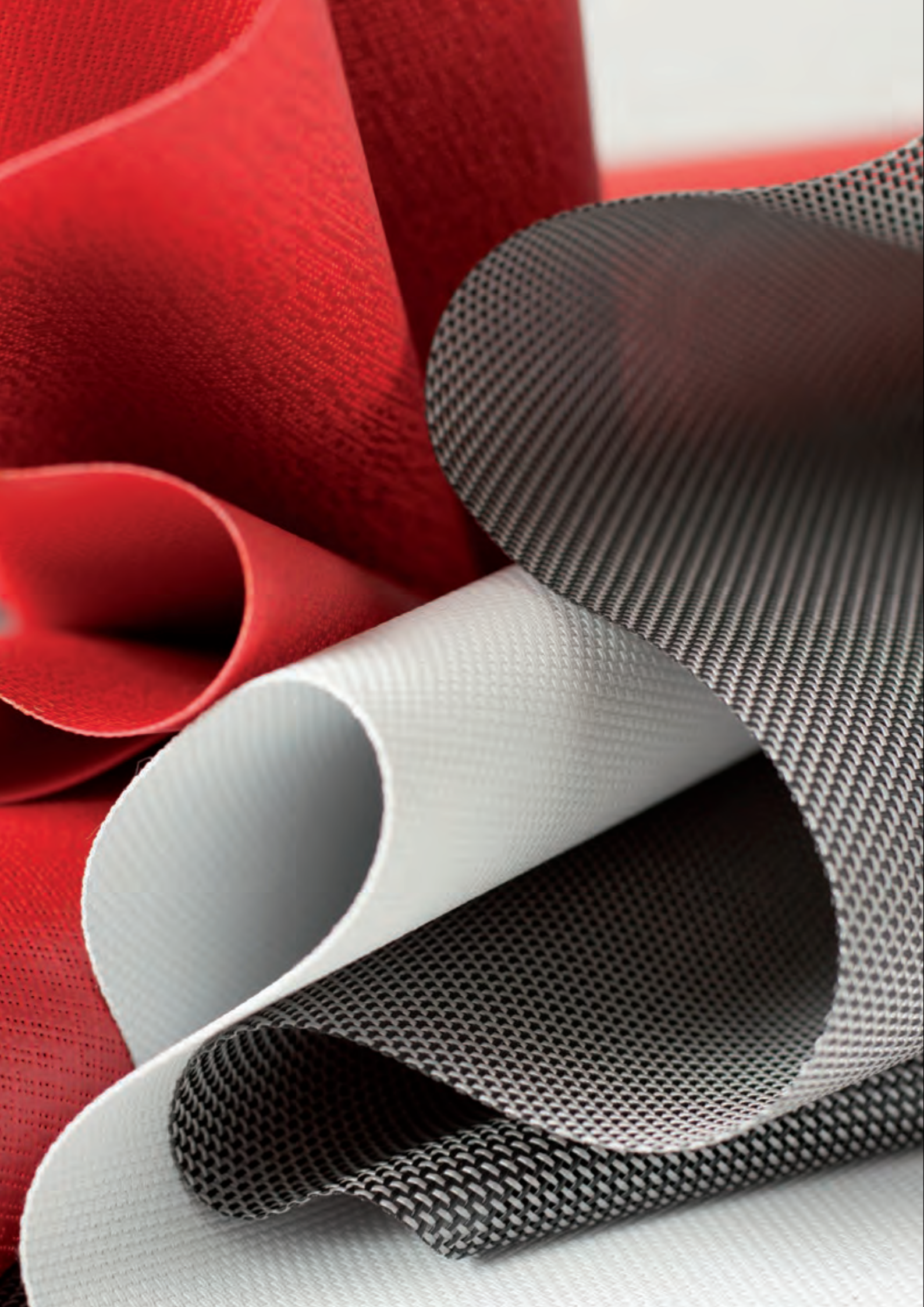
## Frontside Safe P35

### The facade solution that addresses non-combustibility requirements

- **Maximum fire safety**
  - Non-inflammable, classified A2
  - Resistant to high temperatures
- **Increased longevity**
  - Easy maintenance due to its self-cleaning non-stick surface
  - Extremely durable due to its glass micro-cable structure





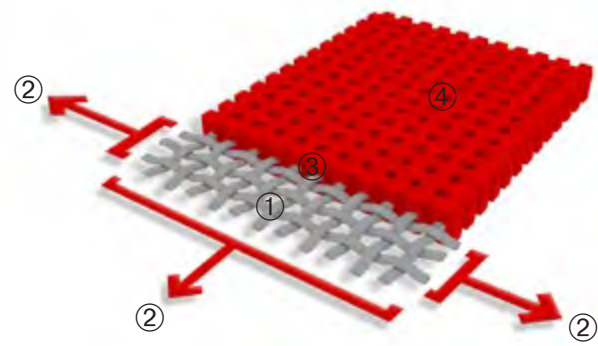


# Précontraint Technology

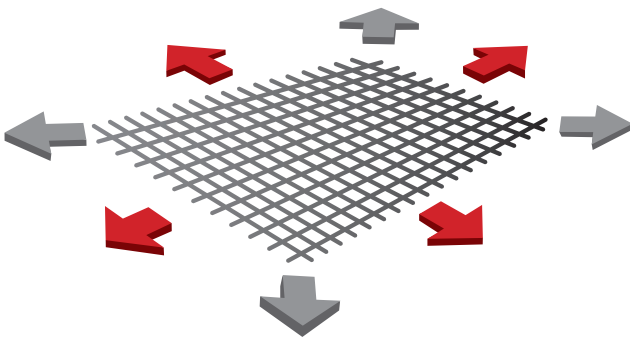
## Serge Ferrari technology makes all the difference

This innovative, internationally patented technology consists of maintaining the composite in biaxial tension throughout the manufacturing cycle. This gives these materials exceptional performance, enabling them to exceed market standards in terms of dimensional stability, mechanical resistance, coating thickness, and evenness.

High-tenacity polyester micro-yarn base cloth	1	Superior elongation and tear resistance
A coating with fabrics under bi-axial constant tension in both warp and weft directions	2	No deformation during processing and use
Greater coating at the top of the yarns and a dirt resistant surface treatment	3	Superior aesthetic and mechanical durability
Exceptional flatness and thinness	4	Smooth finish easy to clean, space saving, easy rolling



Bi-axial tension



True grain perfectly respected from one production run to the next  
Low elongation capacity



# Serge Ferrari project assistance

Since 1973, Serge Ferrari has designed, manufactured and distributed flexible, innovative composite materials with high added value.

Beyond the requirement for the quality of its products, Serge Ferrari prioritizes assisting all customers and project participants in the success of their projects:

## ■ Decision-making assistance

- Upstream involvement alongside architects and design consultants to work in conjunction with decision-makers to find the ideal solution for facade coverings.
- Espace Showroom in Paris, allowing:
  - the materials to be seen and touched,
  - assessment of the various types of installation on a perforated facade,
  - access to a library of more than 10,000 product samples and their available color palettes as well as thread spools,
  - meetings with facade specialists.

## ■ Design assistance

- Creation of assistance tools in relation with project size,
- Provide technical and documentary resources, including biaxial grafts intended for design consultants for calculating weight, samples, technical documentation, reports on solar and light properties for each color in the range, maintenance notices.

## ■ Project assistance

- Introduction to and coordination with a network of professionals specializing in the design and installation of bioclimatic facades,
- Development of ad hoc training for installation teams (video tutorials).





# The Technical Sector

From its beginning, Serge Ferrari has been supported by a network of specialist partners, manufacturers, and installers. Working on new construction or renovation projects, Serge Ferrari offers an overall solution from design to on-site installation, guaranteeing the monitoring and quality of projects completed with Frontside composite membranes.

## ■ Design

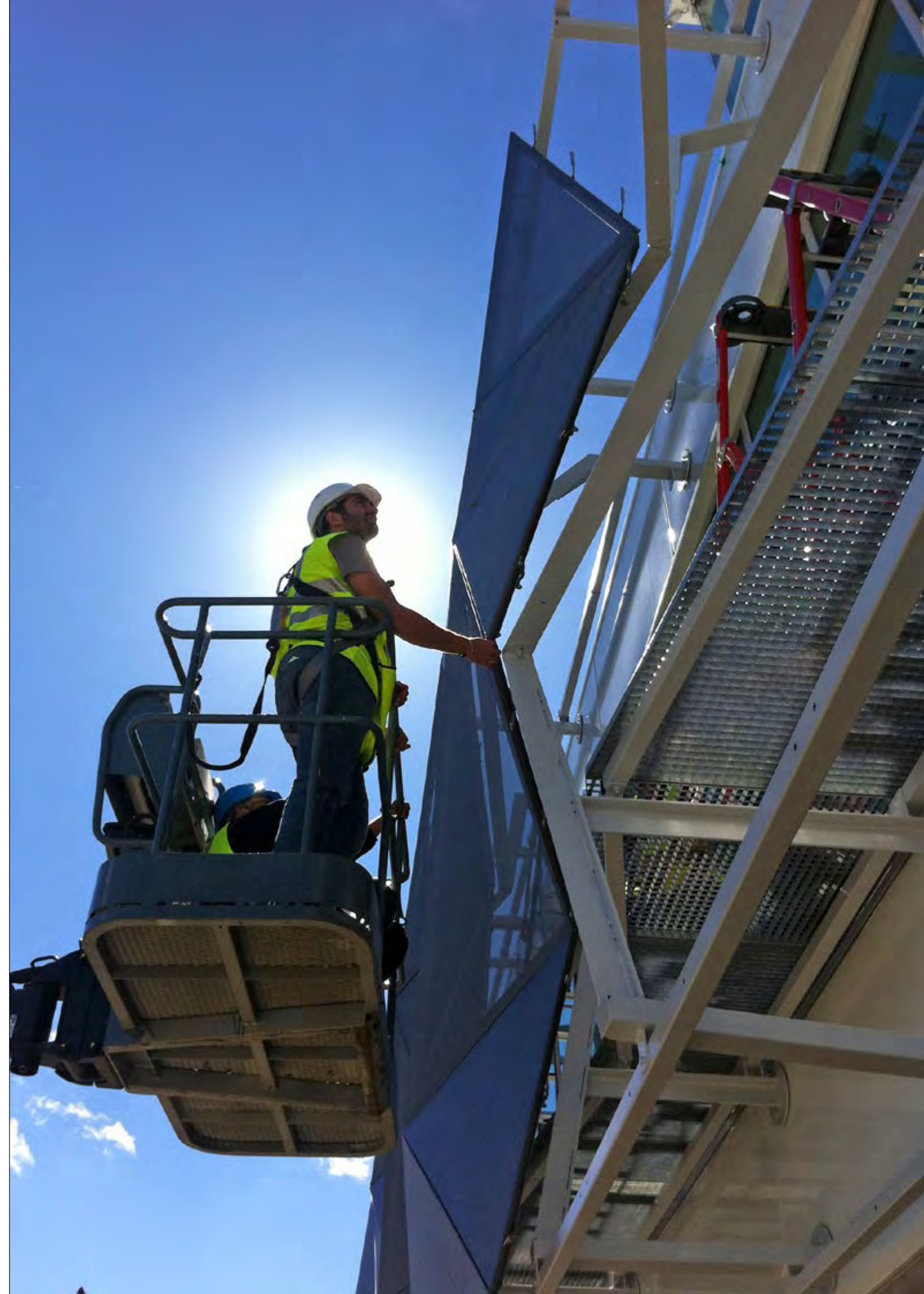
Each project is subject to a made-to-measure study with a design office. The information required for dimensional modeling is collected to design the products in compliance with the technical specifications.

## ■ Manufacture

Once the study and testing phase has been validated, assembly is carried out in workshops equipped with machines allowing a range of manufacturing in accordance with the degree of complexity. Depending on the recommended mounting system, the pre-manufacture of panels in the workshop (membrane + aluminum frame) optimizes the preparation and conduct of the project.

## ■ Assembly and site monitoring

Professionals carry out installation on-site. The installation equipment is adapted to each site in accordance with the fixation system and the access height required.







## Photo Credits

### Cover

- **West Hills Medical Office Building - West Hills CA (USA)**

Year: 2017

Surface area: 8 500 m<sup>2</sup> - 91 493 sq ft

Fabricator and installer: Structurflex & Facade Textile International

Architect: Michael W. Folonis Architects

Photographer: ©Art Gray

### Interior

- **Sakarya - Stadium (Turkey)**

Year: 2017

Architect: Alper Aksoy Architects

Photographer: ©Yercekim Photography

- **Wings Campus - Head Office of Airbus Group - Toulouse - Blagnac (France)**

Year: 2016

Surface area: 2 400 m<sup>2</sup> - 25 833 sq ft

Prime contractor: Groupe Airbus

Contracting authority: Calvo Tran Van Architecture - Toulouse + WSP (BET structure), Bateco Society (economist), Julie Poirrel (landscape gardener), Burgeap (BET geothermal energy), Green Affair (Breeam)

Architect: Calvo Van Tran

Photographer: ©Pascal Ledoare

- **Rice University - Car Park - Houston (USA)**

Surface area: 1 600 m<sup>2</sup> - 17 222 sq ft

General contractor: J.E. Dunn

Fabricator and Installer: Structurflex

Total area: 14 800 m<sup>2</sup> - 159 305 sq ft

Capacity: 496 parking spaces

Architect: Kieran Timberlake

Photographer: © G. Lyon Photography

- **La Passerelle - Media Library - La Tour-du-Pin, (France)**

Year: 2016

Surface area: 300 m<sup>2</sup> - 3 229 sq ft

Contracting authority: Communauté de Communes du Pays des Vallons de La Tour-du-Pin

Fabricator and Installer: Hureau & Facade Textile International

Architects: Jean-Philippe Charon et Thierry Rampillon - CR&ON Architectes

Design offices: INGEROP – Structure & Fluides & VRD & HQE & Economiste, P. PIONCHON - Landscape gardener

Photographer: ©Pierre Le Chatelier

- **Silver Spur - Realty Offices - California (USA)**

Year: 2015

Architect: X-Ten Architecture

Photographer: ©J. Miller Canvas

- **Institut National Polytechnique - Toulouse (France)**

Year: 2017

Surface area: 1 200 m<sup>2</sup> - 12 916 sq ft

Contracting authority: INP Toulouse

Energy audit: F4 Ingénierie

Architect: Calvo Van Tran

Photographer: ©Serge Ferrari

- **Markant - Theatre - Uden (the Netherlands)**

Year: 2013

Surface area: 850 m<sup>2</sup> - 9 149 sq ft

Client: Heven Group BV, Gemeente Uden, Theatre Markant NV

Main contractor: Van der Heijden Bouw en Ontwikkeling

Fabricator and Installer: Buitink Technology

LED lighting of the facade: 3TAC

Architect: Architectuurstudio HH

Photographer: ©Luuk Kramer, NOAHH Van der Lee

- **Gotha Cosmetics - Head Office - Lallio (Italy)**

Year: 2018

Architects: iarchitects (Davide Cumini, Pietro Perego, Francesco D'Asero)

Photographer: ©Claudia Calegari

- **Tech2 - Head Office of Techquadrat - Marchtrenk (Austria)**

Year: 2017

Surface area: 800 m<sup>2</sup> - 8 611 sq ft

Photographer: ©Silvio Schoisswohl, Techquadrat

- **B55 - Wings Campus - Restaurant Airbus Group - Toulouse - Blagnac (France)**

Year: 2016

Surface area: 800 m<sup>2</sup> - 8 611 sq ft

Prime contractor: Groupe Airbus

Installer: Facade Textile International

Photographer: ©Pascal Ledoare

- **Carré Léon Gaumont - Cultural Centre - Sainte-Maxime (France)**

Year: 2008

Surface area: 800 m<sup>2</sup> - 8 611 sq ft

Total area: 5 265 m<sup>2</sup> - 56 671 sq ft

Contracting authority: The town of Sainte-Maxime

Assistance to the Contracting

Authority: Var Aménagement

Développement

Architect: Jean-Pascal Clément

Photographer: ©Jean-Pascal Clément

- **Serge Ferrari Showroom - Paris (France)**

Architect: Studio Totem

Photographer: ©Simon Dubois

- **Photographer: ©Nicolas Robin**

- **Oasis Hotel - Lanzarote (Canary Islands Archipelago)**

Year: 2012

Surface area: 1500 m<sup>2</sup> - 16 145 sq ft

Architect: Integral

Engineering and Installation: Batspain

- **FBI - Regional Headquarters parking facility - San Diego (USA)**

Year: 2013

Surface area: 2 800 m<sup>2</sup> - 30 138 sq ft

Architect: HGA Architects

Photographer: ©Darren Bradley

- **Public Finance Centre - Reunion Island**

Year: 2014

Architect: Altitude 80 Architectes / M. Gemehl

Installer: AB2CS & Facade Textile International

Photographer: ©AB2CS



