Serge Ferrari
architecture

Tenseo
sustainable lightweight **architecture**



BUITINK TECHNOLOGY
Advanced Lightweight Structures

Dear reader

Welcome to the captivating world of Serge Ferrari Architecture, where you will discover a complete range of fabrics designed to create outstanding forms of modern light-weight architecture.

Please take a tour through some of most beautiful projects and learn more about how our products can help to improve the design, acoustics, and thermal comfort of buildings. All our products are engineered to provide highest fire safety and to meet the most demanding needs of long-lasting architectural buildings, whether designed for sports, cultural, residential, or other events.

Our guide will introduce the different technologies used to develop our innovative and durable products and provide further data related to our rich product range. Finally, you will find a selection guide which may help you to choose the most suitable fabrics for your project needs, considering the requested function and desired performance.

We hope you will enjoy our latest work and find enriching and inspiring information for your unique project.

Kind regards,

Murat Devecioglu
Business Group Manager



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Burj Al Arab

Enclosed building
Dubaï, **United Arab Emirates** | *Hospitality*



Architect:
WS Atkins

Building owner:
Jumerah Beach Resort LLC

Fabrication:
Koch Hightex GmbH

Membrane:
Tenseo Xtrem GF 7000

Surface:
15,000 sqm

Completion date:
1999

Le Burj Al Arab est un projet phare connu dans le monde entier. Il a été construit pour ressembler à la voile d'un boutre (voilier arabe).
Cette façade de 15 000 m² et 200 m de haut a été réalisée en Tenseo Xtrem GF 7000.
Ce projet illustre parfaitement la longévité de notre produit et sa résistance aux conditions climatiques extrêmes. En effet, l'installation a été achevée en 1999 et est toujours en très bon état aujourd'hui : preuve d'une excellente résistance aux rayons UV intenses, aux grandes variations de température, aux tempêtes de sable tout comme à l'atmosphère marine.

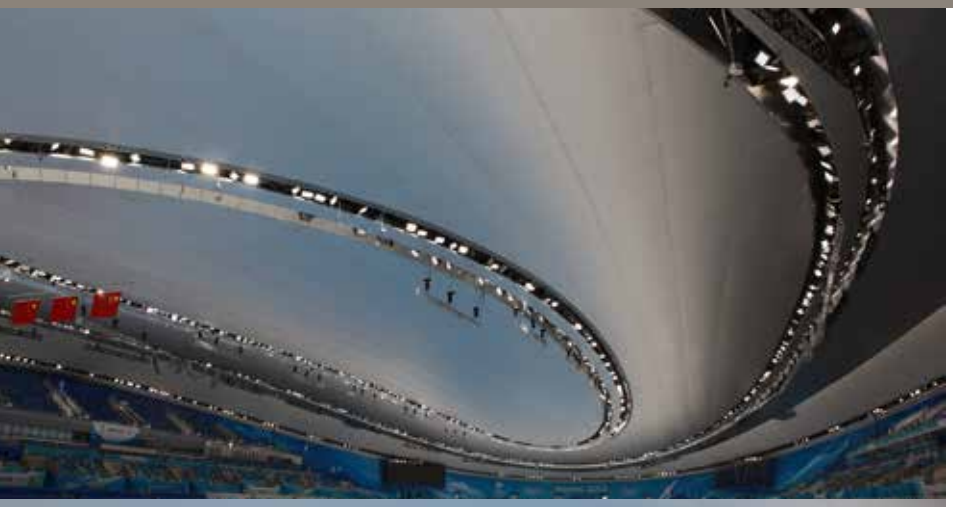
The Burj Al Arab is a world-famous landmark project. It was built to resemble the sail of a dhow (Arabian sailing ship).
This 15,000 sqm and 200 m high facade was made of Tenseo Xtrem GF 7000.
This project perfectly illustrates the longevity of our product and its resistance to extreme weather conditions. The installation was completed in 1999 and is still in very good condition today: proof of excellent resistance to extreme UV rays, large temperature variations, sandstorms as well as to the marine atmosphere.

- **Extreme longevity and durable aesthetics in front of intensive UV radiation**



National Speed Skate Oval

Enclosed building
Bejing, **China** | *Sport*





Architect:
M. Zheng Fang, Biad

Fabrication, installation:
Beijing N&L

Membrane:
Tenseo Comfort SK20

Surface:
22,000 sqm

Completion date:
2022



Cette patinoire a été conçue pour accueillir les Jeux Olympiques d'hiver de 2022 à Pékin. La conception vise à être un symbole national, ainsi qu'un bâtiment durable pour un héritage à long terme après les Jeux.
Le Tenseo Comfort SK20 de Serge Ferrari a été selectionné pour répondre à plusieurs enjeux :

- le confort acoustique représente un élément fondamental pour tout équipement sportif, permettant aux sportifs d'accéder à une concentration maximale. Le SK20 réduit significativement le temps de réverbération dans cet immense volume apportant le confort acoustique requis.
- la légèreté de la toile est également un véritable atout, facilitant ainsi l'installation du plafond de grande envergure.
- Grâce au traitement LowE, le plafond fait office de barrière thermique renforcée.
- De plus, le produit s'intègre parfaitement au bâtiment et offre une magnifique perspective au plafond de cette patinoire.

Tous ces avantages ont fait de Tenseo Comfort SK20 la meilleure option pour la réalisation de cette patinoire.

This ice rink was designed to host the 2022 Winter Olympics in Beijing. The design aims to be a national symbol, as well as a sustainable building for a long-term legacy after the Games.
Serge Ferrari's Tenseo Comfort SK20 was selected to address several issues:

- *Acoustic comfort is a fundamental element for any sports facility, allowing athletes to achieve maximum concentration. The SK20 significantly reduces the reverberation time in this huge volume, providing the required acoustic comfort.*
- *The lightness of the fabric is also a real asset, facilitating the installation of the large-scale ceiling.*

Thanks to the LowE treatment, the ceiling acts as a reinforced thermal barrier.
In addition, the product integrates perfectly with the building and offers a magnificent perspective on the ceiling of this ice rink.
All of these advantages made Tenseo Comfort SK20 the best option for this ice rink.

- **High acoustic and thermal comfort**
- **Extremely light ceiling**
- **Non-combustibility to fire**



Sportzentrum Julius Hirsch

Enclosed building
Fürth - **Germany** | *Sport*

Architect:
FAB Architekten, Mannheim

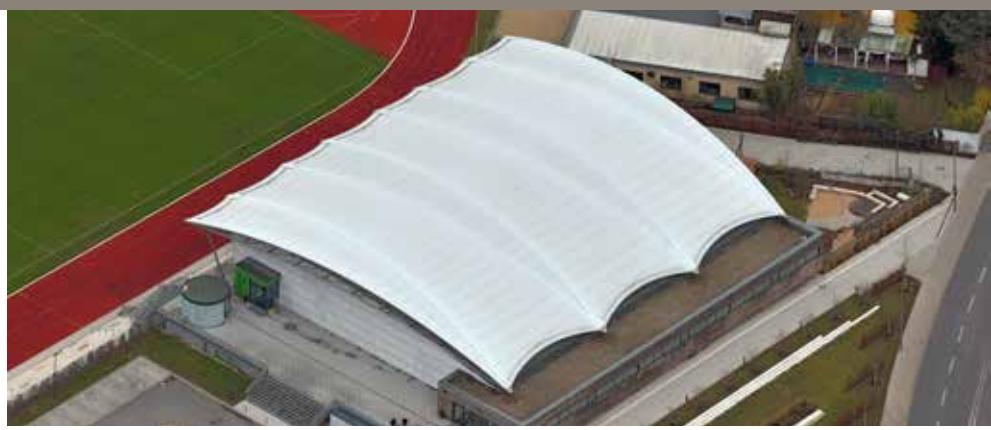
Membrane contractor:
Graboplan Kft.

External membrane:
Tenseo Xtrem 1202 T2
Highly translucent
2,300 sqm

Insulation:
(Timax) translucent glass wool insulation
40 cm thick

Internal membrane:
Tenseo Advanced 1002S2 HTL
2,300 sqm

Completion date:
2017



D'un point de vue architectural, la forme du toit rappelle celle d'un sprinter sur le starting-block. L'impression de légèreté du bâtiment semble adaptée aux activités dynamiques qui se déroulent à l'intérieur. Le coefficient global de transfert de chaleur (valeur U) est de 0,23 W/m²/K pour les éléments opaques et de 1,6 W/m²/K pour les éléments translucides, qui comprennent une membrane de toit tendue et une isolation Timax de 40 cm d'épaisseur avec une valeur U=0,25 W/m²/K.

From an architectural point of view, the shape of the roof reminds of a sprinter on the starting block. The lightweight impression of the building appears adequate to the dynamic activities inside. The overall heat transfer coefficient (U value) is 0.23 W/sqm/K for the opaque and 1.6 W/sqm/K for the translucent components which include tensile roof membrane plus 40 cm thick Timax insulation with U=0.25 W/sqm/K.



Une étude complète (accès par code QR) quantifie la lumière du jour et la performance énergétique d'une toiture à membrane multicouche. Les propriétés optiques de la toiture ont été mesurées avec une transmission visuelle totale de la lumière de 0,72%. Une modélisation annuelle de la lumière du jour basée sur le climat fournit des indicateurs de lumière du jour pour différents scénarios de construction.

Les résultats montrent que, par rapport à une seule façade vitrée et un toit opaque, le toit à membrane translucide et thermiquement isolé augmente l'autonomie en lumière du jour continue (DA 700 continu) de 15% à 38%. Cela se traduit par une réduction de 30% de la demande d'électricité pour l'éclairage artificiel dans la zone couverte du terrain de sport. Ces résultats seront très utiles en tant que comparaison et point de référence pour les planificateurs, les investisseurs et les futurs bâtiments de ce type.

A full investigation (QR code access) quantifies the daylight and energy performance of a multi-layer membrane roof. The optical properties of the roof were measured with a total visual light transmission of 0.72%. A climate based annual daylight modeling delivers daylight indicators for different constructions scenario.

The results show that, in comparison to only one glass facade and an opaque roof, the additional translucent and thermally insulated membrane roof increase the continuous Day light Autonomy (continuous DA 700) from 15% to 38%. This results in a 30% reduction of the electricity demand for artificial lighting in the roof covered area of the sport field. These results shall be very valuable as a comparison and benchmark for planners, investors and future building of this type.

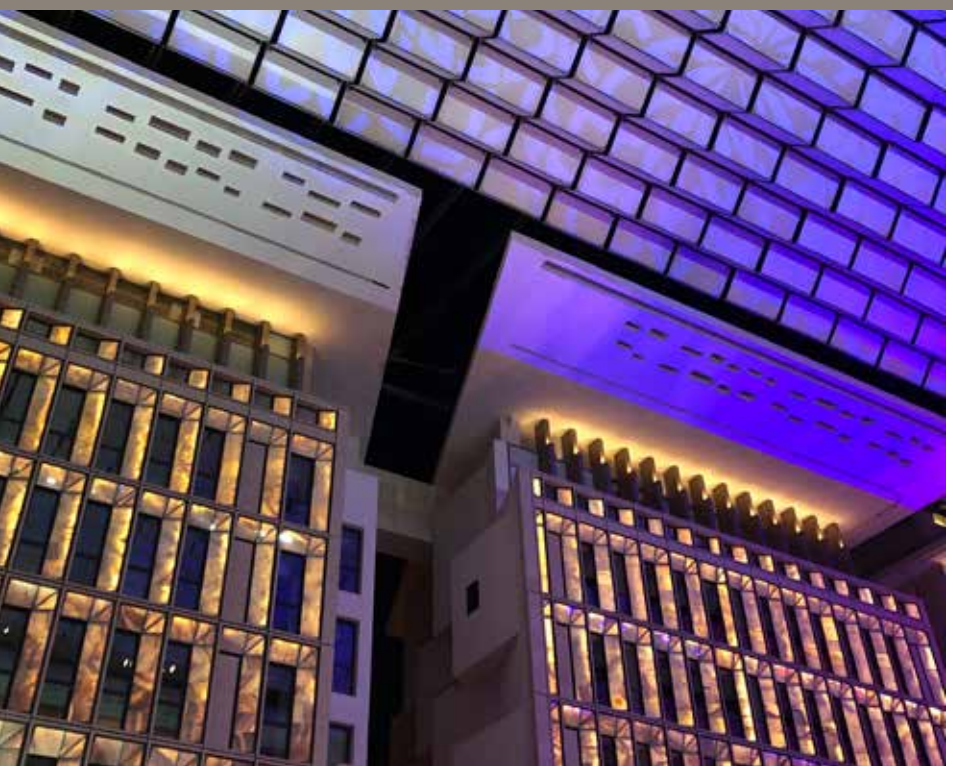
Daylight performance Study carried out by Research Center for sustainable Energy Technology, University of Applied science Stuttgart.

- **High thermal insulation**
- **High translucency**
- **Daylight autonomy**



Barahat Al-Nouq Square Club

Tensile roof
Doha, **Qatar** | *Hospitality*



Architect:
Mossessian & Partners

Structural engineers:
Schlaich Bergermann Partners, Germany

Membrane contractor :
Pfeifer-Covertex

Membranes:
Tenseo Advanced 1002S2, white & gold (retractable roof)
Tenseo Advanced 1002 Opaque Dualtone white/ LowE (Sunsails)

Surface:
10,000 sqm



Barahat Al Nouq est la place centrale du cœur de Doha, la capitale du Qatar. En s'inspirant de l'architecture arabe traditionnelle, la construction du toit réinterprète les éléments de construction anciens qui fonctionnaient déjà comme adaptatifs et réactifs.

Le résultat de ce magnifique projet est un toit qui intègre une technologie orientable et mobile capable de s'adapter aux variations climatiques et à la position du soleil. Ces éléments cinétiques étaient déjà utilisés dans l'architecture arabe traditionnelle comme le « malqaf » et sont maintenant réinterprétés sous la forme de ce toit suspendu.

Notre membrane Tenseo Advanced 1002S2 répondait parfaitement aux attentes en offrant d'excellentes propriétés mécaniques ainsi qu'une légèreté, une souplesse et une adaptabilité sans faille.

Barahat Al Nouq is the central square in the heart of Doha, the capital of Qatar. Drawing inspiration from traditional Arabic architecture, the roof construction reinterprets ancient building elements that already functioned as adaptive and responsive.

The result of this magnificent project is a roof that incorporates steerable and mobile technology capable of adapting to climatic variations and the position of the sun. These kinetic elements were already used in traditional Arabic architecture as the "malqaf" and are now reinterpreted in the form of this suspended roof.

Our Tenseo Advanced 1002S2 membrane was the perfect answer, offering excellent mechanical properties as well as lightness, flexibility and adaptability.

- **Retractable and orientable roof for a perfect adaptation to the climatic variations**



Quzhou stadium

Tensile roof
Quzhou, **China** | *Sport*



Architect:
MAD

Membrane contractor:
Shenzhen Kingwolf Fabric Technology Develop. Co., Ltd

Membranes:
Tenseo Exclusive T 1100
Tenseo Frontside M 700

Surface:
42,800 sqm
40,900 sqm

Completion date:
2021



D’une capacité d’accueil de 30 000 places, ce stade semi-enterré est équipé d’un toit se présentant sous la forme d’une grande couronne blanche de près de 250 mètres de diamètre. La surface extérieure, exposée aux éléments, est une toile Tenseo Exclusive T 1100.
Imperméable et translucide afin de laisser passer la lumière du jour, elle totalise une surface de près de 42 800 m^2.

La surface interne du toit est constituée de plus de 40 800 m^2 de Tenseo Frontside M 700, une membrane PTFE ignifugée de classe A qui répond aux critères les plus strictes en matière de réglementation incendie.

Outre leurs performances techniques, les deux membranes Serge Ferrari offrent au projet leurs atouts esthétiques indiscutables par l'évocation d'un banc de nuages survolant les collines du parc. Véritable pont entre nature et architecture, elles participent ainsi à la création d’un paysage urbain assurément unique en son genre.

With a capacity of 30,000, this semi-underground stadium is equipped with a roof in the form of a large white crown nearly 250 meters in diameter. The outer surface, exposed to the elements, is a Tenseo Exclusive T 1100 fabric, a waterproof and translucent fabric to let in daylight, with a total surface area of nearly 42,800 m^2.

The internal surface of the roof is made up of more than 40,800 m^2 of Tenseo Frontside M 700, a Class A fire-retardant PTFE membrane that meets the most stringent fire regulation criteria.

In addition to their technical performance, the two Serge Ferrari membranes offer the project their indisputable aesthetic advantages by evoking a bank of clouds flying over the hills of the park. A true bridge between nature and architecture, they contribute to the creation of an urban landscape that is truly unique.

- **Visual comfort thanks to the high translucency**
- **High durability**



Arena de Amazônia

Tensile roof
Manaus, **Brazil** | *Sport*



Architect:
GMP Architects

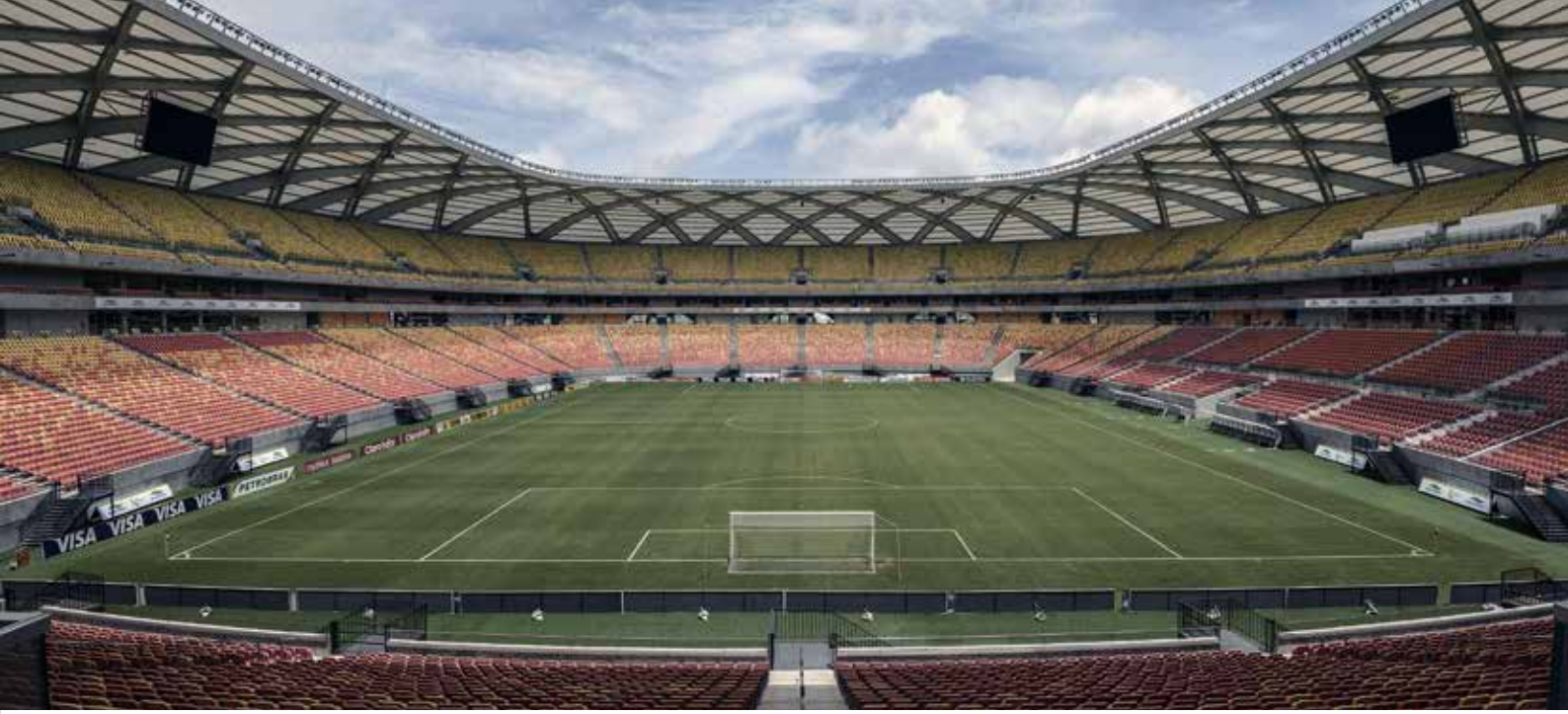
Consulting engineers:
SBP

Membrane contractor:
CenoTec GmbH

Membrane:
Tenseo Xtrem GF 4500

Surface:
54,000 sqm

Completion date:
2014



Ce stade a été construit à l'occasion de la coupe du monde FIFA en 2014 au Brésil. Le défi à relever pour ce stade d'une capacité de 44 400 spectateurs reposait sur sa conception :
elle devait à la fois s'intégrer par un esthétisme simple et efficace à l'environnement urbain mais aussi devenir une référence et un symbole fort pour ce pays où la fascinante forêt tropicale offre une diversité de formes naturelles.

Utilisant une architecture textile légère, l'Arena da Amazônia offre la meilleure protection possible contre le soleil et une ventilation optimale.
La spectaculaire structure portante de la toiture textile de 35 m de haut s'inspire de la jungle tout en évoquant les nervures des feuilles afin d'intégrer parfaitement le stade dans son environnement.

The stadium was built for the 2014 FIFA World Cup in Brazil. The challenge for this stadium with a capacity of 44,400 spectators lay in its design: it had to integrate with a simple and effective aesthetic into the urban environment. but also become a reference and a strong symbol for this country where the fascinating tropical forest offers a diversity of natural forms.

Using a light textile architecture, the Arena da Amazônia offers the best possible protection from the sun and optimal ventilation.
The spectacular load-bearing structure of the 35-meter high textile roof is inspired by the jungle while evoking the veins of the leaves in order to perfectly integrate the stadium into its environment.

- **Extreme longevity and aesthetics**
- **Non-combustible material**
- **Visual comfort thanks to a high translucency**



Santiago del Estero stadium

Tensile roof

Santiago del Estero, **Argentina** | *Sport*



Architect:
Luciani Associates Architectes

Membrane contractor:
Cidelsa, Klekta

Fabrication:
Cidelsa

Membrane:
Tenseo Advanced 1202S2
Tenseo Advanced 1002 Opaque Dualtone
Tenseo Frontside 381

Surface:
46,000 sqm

Completion date:
2021

L'Estadio Único de Santiago del Estero est un stade de football situé à Santiago del Estero, en Argentine pouvant accueillir plus de 30 000 personnes.
Pour la réalisation de ce projet, une membrane Tenseo Advanced 1002 Opaque Dualtone Concrete/White a été spécialement conçue afin d'obtenir ce jeu de couleurs et apporter une touche esthétique si particuliere tandis que la majeure partie a été réalisée en Tenseo Advanced 1202S2 White translucent. En plus de cette enveloppe XXL, l'entrée principale du stade est en Tenseo Frontside 381.
Ce sont en tout 46 000 m² de membranes qui ont été requis pour la réalisation du stade Único.

The Estadio Único de Santiago del Estero is a soccer stadium located in Santiago del Estero, Argentina with a capacity of more than 30,000 people.
For the realization of this project, a Tenseo Advanced 1002 Opaque Dualtone Concrete/White membrane was specially designed to obtain this play of colors and give a particular aesthetic touch, while the main part was made of Tenseo Advanced 1202S2 White translucent. In addition to this XXL envelope, the main entrance of the stadium is made of Tenseo Frontside 381. A total of 46,000 sqm of membranes were used to build the Único stadium.



- **Complete and lightweight building envelope**
- **Rain/sun protection and ventilation**



FNB stadium

Tensile roof
Johannesburg, **South Africa** | *Sport*

Architect:
Boogertman + Partner, Populous

Membrane contractor:
Hightex GmbH

Membrane:
Tenseo Xtrem GF 7000

Surface:
33,000 sqm

Completion date:
2010

Le stade historique Johannesburg FNB a été rénové pour les matchs de la Coupe du monde de football 2010 et a notamment accueilli le match d'ouverture ainsi que la finale. Il dispose d'une capacité gigantesque de 95 000 spectateurs.
La membrane Tenseo Xtrem GF 7000 by Verseidag a été retenue car elle offre la meilleure résistance face à la forte exposition au soleil sud-africain.
Ce sont en tout 33 000 m² de membranes qui ont été installées pour réaliser ce projet d'envergure.

The historic Johannesburg FNB stadium was renovated for the 2010 World Cup matches and hosted the opening match and the final. It has a huge capacity of 95,000 spectators.
The Tenseo Xtrem GF 7000 by Verseidag membrane was chosen because it offers the best resistance to the strong South African sun. A total of 33,000 sqm of membranes were installed for this large-scale project.





- **Extreme resistance to the sun**
- **Extreme aesthetic durability**

Heartfulness Meditation Centre

Tensile roof
Hyderabad, **India** | *Worship*



Architect:
Creators Architects

Building Owner:
Shri Ram Chandra Mission

Membrane contractor:
Technospan Structures Pvt Ltd

Membranes :
Tenseo Xtrem TX30-III
30,000 sqm
Tenseo Advanced 1002S2 HTL
3,000 sqm
Tenseo Comfort SW
15,000 sqm

Completion date:
2020

Le centre Kanha Santi Vanam, situé dans la région du Telengana en Inde est, à ce jour, le plus grand centre de méditation au monde, du fait de sa capacité d'accueil de plus de 100 000 personnes.
Cet ashram est recouvert des toiles Tenseo Xtrem TX30-III, et Tenseo Advanced 1002S2 HTL, qui combinent à la fois haute résistance, durabilité, esthétique et une excellente transmission de la lumière naturelle.
La toile Tenseo Comfort SW installée en sous-face, complète l'installation avec ses excellentes performances acoustiques offrant aux participants un environnement sonore propice à la méditation.

The Kanha Santi Vanam center, located in the Telengana region of India, is the largest meditation center in the world today, with a capacity of over 100,000 people.
The ashram is covered with Tenseo Xtrem TX30-III, and Tenseo Advanced 1002S2 HTL, which combines high strength, durability, aesthetics and excellent natural light transmission.
The Tenseo Comfort SW installed underneath, completes the installation with its excellent acoustic performance offering participants a sound environment conducive to meditation.

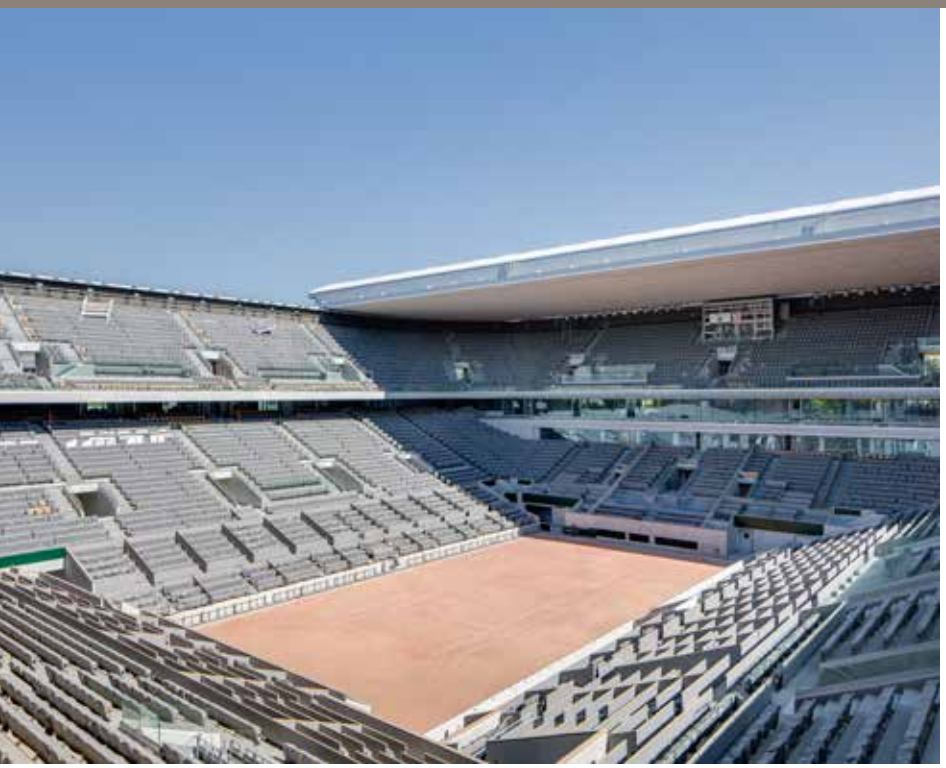
- **Glare control thanks to the combination of two fabrics**
- **Covered outdoor sound absorber**



Central Court Philippe-Chatrier, Roland-Garros

Tensile roof

Paris, **France** | *Sport*



Architect:
ACD Girardet, DVVD, Mimram

General Contractor:
Vinci Construction France

Membranes fabrication & installation:
Tensaform Membran Yapilar San. Tic. A.S.

Membranes:
Tenseo Xtrem TX30-II 15,000 sqm
Tenseo Comfort AW 9,000 sqm

Surface area:
1ha retractable roof made with 11 wings

Completion date:
Spring 2020



Le prestigieux stade de Roland-Garros, situé à l'Ouest de Paris, en lisière du bois de Boulogne, accueille chaque année des milliers de visiteurs. Le court Philippe-Chatrier, construit en 1928, est le court central du stade.

Il a fait l'objet d'une importante rénovation à partir de 2018 afin de pouvoir accueillir de nombreux spectateurs pour l'édition de Roland-Garros 2020.

Pour ce projet, la toile Tenseo Xtrem TX30-II a pu garantir la résistance aux intempéries, la durabilité dans le temps, l'étanchéité et le passage de la lumière naturelle.
De plus, l'ajout à l'intérieur des ailes avec de la toile Tenseo Comfort AW a permis de garantir la performance acoustique exigée.

The prestigious Roland-Garros stadium, located in the west of Paris, on the edge of the Bois de Boulogne, welcomes thousands of visitors every year.
The Philippe-Chatrier court, built in 1928, is the central court of the stadium.

It has undergone a major renovation since 2018 to accommodate many spectators for the Roland-Garros 2020 edition.

For this project, Tenseo Xtrem TX30-II membrane was able to guarantee weather resistance, durability over time, waterproofing and the passage of natural light.
Moreover, the addition of Tenseo Comfort AW fabric on the inside of the wings guaranteed the required acoustic performance.

- **Less than 2 kg/sqm of fabrics to ensure:**
  - **Watertightness**
  - **Sound absorption**
  - **Natural light input**



Chrifia
Golf Club House

Tensile roof
Chrifia, **Morocco** | *Sport*



Architect:
Youssef Melehi, Rabat

Consultant:
PRAT SA, structural engineering

Fabrication:
Ametema, Architecture Métallo-textile

Membrane:
Tenseo Advanced 1002S2

Surface:
1,500 sqm



Le club house est un bâtiment étanche à toit plat, de style "Marrakech", avec une tour centrale en pierre. L'élément architectural est un grand toit tendu inspiré des tentes bédouines, ayant deux objectifs principaux :

- Couvrir et ombrager les terrasses périphériques
- Fédérer le bâtiment et ses terrasses sous une tente taillée comme les pics enneigés des montagnes de l'Atlas.

La toiture tendue apporte une lumière agréable et protège de la chaleur du soleil de Marrakech tout en restant fidèle à l'allégorie des pics enneigés.
L'utilisation de la membrane composite Tenseo Advanced 1002S2 de Serge Ferrari Group apportant une grande stabilité dimensionnelle et un faible fluage s'est révélée d'une importance capitale étant donné la grande toiture d'un seul tenant (50 m x 30 m) et l'ancrage fixe à la tour de pierre. La structure légère a été optimisée pour ne pas dépasser 5 kg/m², acier et membrane compris.

The club house is a flat-roofed, watertight building in the "Marrakech" style, with a central stone tower. The architectural element is a large stretched roof inspired by Bedouin tents, with two main objectives:

- *To cover and shade the peripheral terraces.*
- *To unite the building and its terraces under a tent carved like the snowy peaks of the Atlas Mountains.*

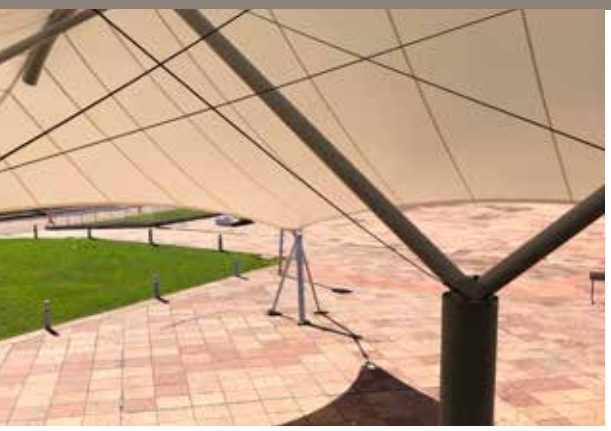
The stretched roof brings a pleasant light and protects from the heat of the Marrakech sun while remaining faithful to the allegory of the snowy peaks.
The use of Tenseo Advanced 1002S2 composite membranes of Serge Ferrari Group with high dimensional stability and low creep is of paramount importance given the large one-piece roof (50 m x 30 m) and the fixed anchoring to the stone tower. The lightweight structure was optimized to not exceed 5 kg/sqm, including steel and membrane.

- **10 times lighter than an all-metal solution**
- **4 times less carbon footprint than an all-metal solution**



Parque del Conocimiento

Tensile roof
Posadas, **Argentina** | *Culture*



Architect & membrane contractor :
Wagg arquitectura Textil

Membrane:
Tenseo Xtrem TX30-III HTL

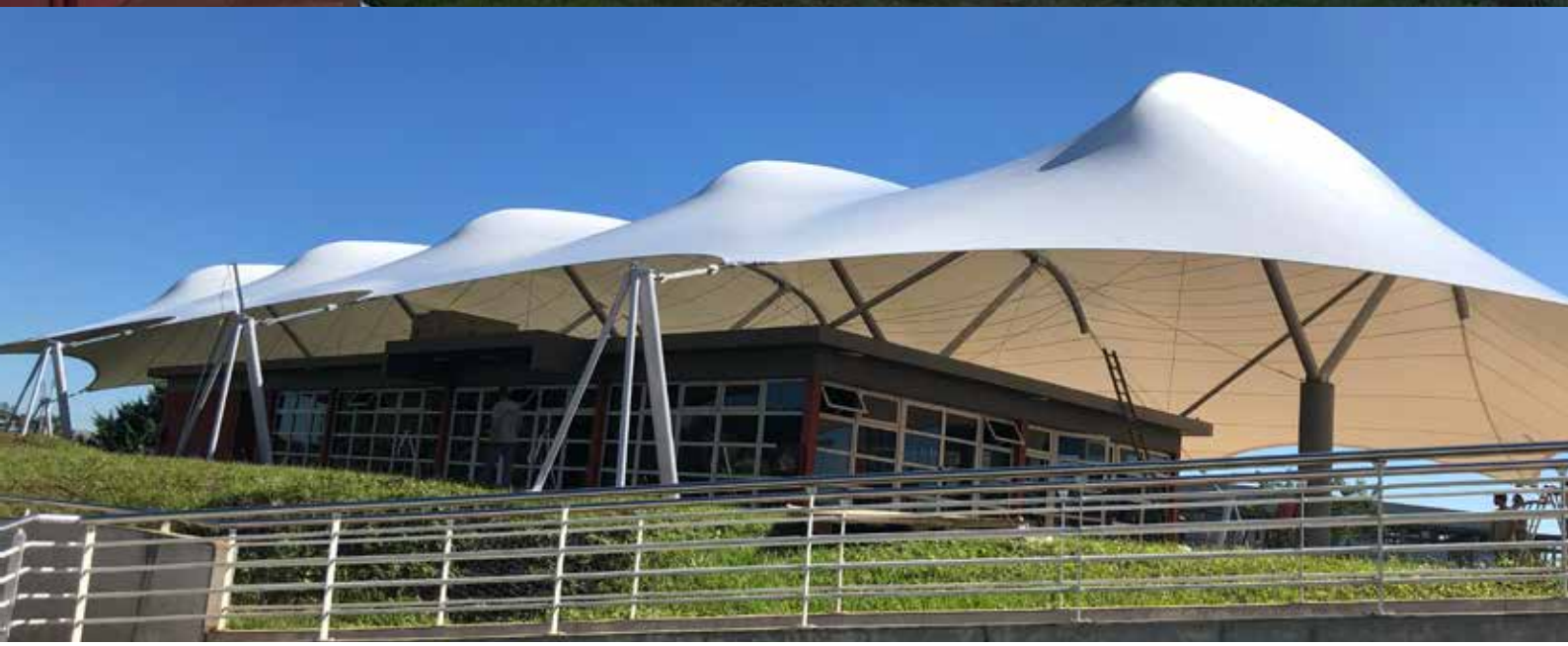
Surface:
1,200 sqm

Completion date:
2020

Le Parque del Conocimiento est le centre culturel de la ville de Posadas, capitale de la province de Misiones en Argentine.
Pour la réalisation de ce projet, un produit hautement translucide était demandé. Le choix de la membrane Tenseo Xtrem TX30-III HTL, a donc été une évidence. En effet, la résistance aux UV extrêmes et au climat tropical était une nécessité et correspondait parfaitement aux atouts de cette membrane de la gamme TX30.

The Parque del Conocimiento is a cultural center in the city of Posadas, capital of the province of Misiones in Argentina.
For this project, a highly translucent product was required. The choice of the Tenseo Xtrem TX30-III HTL membrane was therefore an obvious one.
Indeed, the resistance to extreme UV and tropical climate was a necessity and corresponded perfectly to the assets of this membranes ot the TX30 range.





- **Excellent visual comfort thanks to high translucency**
- **High UV resistance**



Istanbul Grand Airport

Transparent tensile roof
Istanbul, **Turkey** | *Transport*



Architect:
Kayabay Architecture

Fabrication:
Onart Structures

Membrane:
Tenseo Xtrem STFE 50
1,200 sqm
Tenseo Advanced 1202S2
6,000 sqm

Completion date:
2021



L'IGA Istanbul Grand Airport remplace l'ancien aéroport Atatürk. Avec une capacité pouvant atteindre 90 millions de passagers par an et jusqu'à 200 millions en 2028, il est actuellement le plus grand aéroport du monde en termes de passagers et de superficie.
Une extension sous forme de passerelle couverte a été conçue. Cette passerelle non fermée devait être esthétique et protéger des intempéries tout en offrant une luminosité importante pour le confort des passagers.
L'originalité de la passerelle repose sur sa toiture multi-matériaux : l'utilisation de la membrane Tenseo Advanced 1202S2 permet un apport de lumière tandis que la membrane Tenseo Xtrem STFE 50 apporte une grande transparence, évitant toute sensation d'enfermement. Les trois sections ainsi équipées transforment la toiture en de véritables puits de lumière.

IGA Istanbul Grand Airport replaces the former Atatürk Airport. With a capacity of up to 90 million passengers per year and up to 200 million by 2028, it is currently the largest airport in the world in terms of passengers and area.
An extension in the form of a covered walkway was designed. This unenclosed walkway had to be aesthetically pleasing and protect against bad weather, while offering a lot of light for the comfort of passengers.
The originality of the walkway lies in its multi-material roof: the use of Tenseo Advanced 1202S2 allows a contribution of light while the Tenseo Xtrem STFE 50 brings a great transparency, avoiding any feeling of enclosure. The three sections thus equipped transform the roof into real light wells.

- **Indoor protection & outdoor feeling**
- **10 times lighter than glass / steel solution**

Thyssenkrupp Test Tower

Facade - Cladding
Rottweil, **Germany** | Industrial



Architect & membrane contractor:
Werner Sobek

Membrane contractor:
Taiyo Europe GmbH

Membrane:
Tenseo Frontside GFM 21

Surface:
17,000 sqm

La tour d'essai d'ascenseur de TK Elevator, mesurant 246 mètres de haut, est l'une des structures les plus hautes d'Allemagne.
La structure est utilisée pour tester et certifier les ascenseurs à grande vitesse.
Pour la réalisation de ce projet, Tenseo Frontside GFM 21 a été retenu et ce sont en tout 17 000 m² de membrane qui ont été installés.
Cette grille PTFE est extrêmement durable, et en plus de donner à la tour son aspect distinctif et esthétique, il la protège également du rayonnement solaire intense tout en maintenant une vue parfaite vers l'extérieur pour les usagers.

TK Elevator's elevator test tower, measuring 246 meters high, is one of the tallest structures in Germany.
The structure is used to test and certify high-speed elevators.
For this project, Tenseo Frontside GFM 21 was selected and a total of 17,000 sqm of membrane were installed.
This PTFE mesh is extremely durable, and in addition to giving the tower its distinctive and aesthetic appearance, it also protects it from intense sunlight while maintaining a perfect view to the outside for users.

- **Non-combustibility to fire**
- **Heat shield**
- **Beautiful design**



Goodman Business Park | East Gate

Facade - Cladding
Inzai, **Japan** | *Office*



Architect:
Yamashita Sekkei INC

Membrane contractor:
Yamaguchi New Shelter Industry Inc. (FTI)

Membrane:
Tenseo Frontside 381

Completion date:
2020

La façade des bureaux du récent parc logistique de Goodman a été réalisée en Tenseo Frontside 381 et représente l'une des facades textiles tridimensionnelles les plus techniques au monde.
En effet, sa réalisation est basée sur une composition de 324 facettes de membrane qui offrent au bâtiment une dynamique exceptionnelle et unique.
En plus de son apport esthétique, la toile Tenseo Frontside 381 apporte aux usagers un confort optimal en termes de contrôle solaire tout en maintenant une vue parfaite vers l'extérieur.

The office facade of Goodman's recent logistics park was realized in Tenseo Frontside 381 and represents one of the most technical three-dimensional textile facades in the world.
In fact, the realization is based on a composition of 324 membrane facets that give the building an exceptional and unique dynamic.
In addition to its aesthetic contribution, the Tenseo Frontside 381 fabric provides users with optimal comfort in terms of solar control while maintaining a perfect view to the outside.





- **Indoor comfort thanks to thermal control**
- **Excellent view to the outside**
- **Beautiful design**



Rice University Car Park

Facade - Cladding
Houston, Texas, **USA** | *Transport*



Architect:
Kieran Timberlake Architects

Membrane contractor:
Structurflex

Membrane:
Tenseo Frontside 381 (Printed)

Surface:
1,600 sqm

Completion date:
2017



En 2015, l'Université Rice a confié à l'agence américaine, Kieran Timberlake Architects, basée à Philadelphie, la conception d'une aire de stationnement dans une zone délimitée par des chênes verts, des cèdres et proche des bâtiments historiques de l'université.
Afin de l'inscrire dans le prolongement de la chênaie, la membrane a été imprimée sur mesure de feuillages.
Les panneaux en Tenseo Frontside 381 assurent en effet une ventilation naturelle, ce qui permet d'éviter les coûts et les émissions associés à la ventilation mécanique. De plus, l'esthétique du produit offre au bâtiment une dynamique singulière sans dénaturaliser l'environnement qui l'entoure.

In 2015, Rice University commissioned the American firm, Kieran Timberlake Architects, based in Philadelphia, to design a parking lot in an area bordered by holm oaks, cedars and close to the university's historic buildings.
In order to make it a continuation of the oak grove, the membrane was custom printed with foliage.
The Tenseo Frontside 381 panels provide natural ventilation, avoiding the costs and emissions associated with mechanical ventilation. In addition, the aesthetics of the product gives the building a unique dynamic without denaturing the surrounding environment.

- **Excellent smoke evacuation**
- **Beautiful design thanks to the printed fabric**



Lord's Cricket Club

Facade - Cladding
London, **UK** | *Sport*



Architect:
Wilkinson Eyre

Membrane contractor:
Architen Landrell

Membrane:
Tenseo Advanced 902S2

Surface:
2,000 sqm

Completion date:
2022



« La toile Tenseo Advanced 902S2 a été sélectionnée à la suite de l'examen d'échantillons et des recommandations du sous-traitant spécialisé qui a confectionné les auvents. Sa couleur, sa finition, ses performances dans la situation dans laquelle nous l'utilisons, sa durée de vie et sa facilité d'entretien ont constitué les autres critères de choix. […]. Je crois que nous avons utilisé le tissu d'une manière assez inhabituelle en le façonnant sur un cadre à double courbure et en le tendant à des intervalles relativement petits.
Addition élégante à un complexe sportif historiquement et architecturalement riche, il constituera sans doute une bonne référence pour ce type de construction. »

James Perry - Architecte

'The Tenseo Advanced 902S2 fabric was selected following sample review and recommendations from the specialist sub-contractor building the canopies. The fabric was selected for its colour, finish, performance in the situation we are using it, its lifespan and ease of maintenance. I believe we used the fabric in a slightly unusual way by shaping it over a double curved frame and tensioning it at relatively small intervals.
The project is an elegant addition to a historically and architecturally rich sporting context, which will provide a good reference for this type of construction.'

James Perry - Architect

- **Extreme lightness of the envelope**
- **Easy cleaning maintenance**



TEDI Facade Dortmund

Facade - Cladding
Dortmund, **Germany** | *Transport*





Architect:
Spital-Frenking & Schwarz, Hegerath GmbH

Building Owner :
TEDI GmbH & Co KG

Membrane contractor:
Typico GmbH

Membrane:
Tenseo Frontside 381

Surface:
4,000 sqm

Completion date:
2022



La façade du parking du siège européen de TEDI à Dortmund-Brackel a été réalisée avec la toile Tenseo Frontside 381.
La souplesse de cette membrane a permis son installation sur une structure en forme de vagues horizontales. Cette conception particulière sous forme de 3D apporte un réel dynamisme et un design unique.
Au delà de cette touche esthétique, les usagers peuvent pleinement profiter des atouts de la membrane Tenseo Frontside 381. En effet, la façade textile offre un confort visuel grâce à une parfaite visibilité vers l'extérieur. Elle agit aussi comme un réel bouclier thermique en bloquant considérablement la chaleur solaire.
De plus, la grille textile résiste parfaitement aux aléas climatiques tels que les rafales de vent, la grêle ou encore les UV.

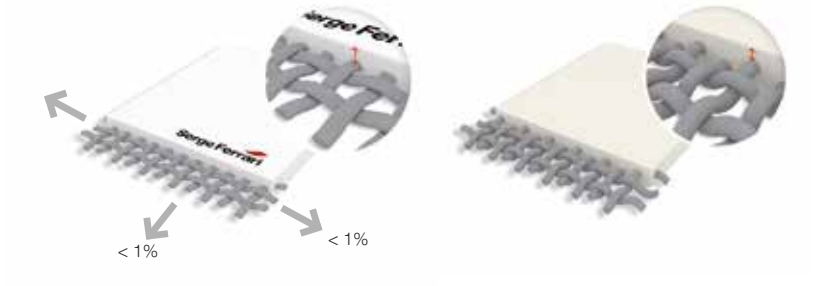
The facade of the TEDI European headquarters parking lot in Dortmund-Brackel was realized with the Tenseo Frontside 381 fabric.
This membrane was installed in the form of horizontal waves to create a 3D facade. It offers a real dynamic and a unique design to this parking lot.
Beyond its unique visual aspect, users will be able to fully benefit from the advantages of the Tenseo Frontside 381 membrane. Indeed, this textile facade offer visual comfort thanks to a perfect visibility towards the outside. It also acts as a real thermal shield by blocking solar heat.
In addition, the textile mesh resists perfectly to climatic hazards such as wind gusts, hail or UV rays.

- **High resistance to weather conditions**
- **Excellent smoke evacuation**

Premium performances
Technologies

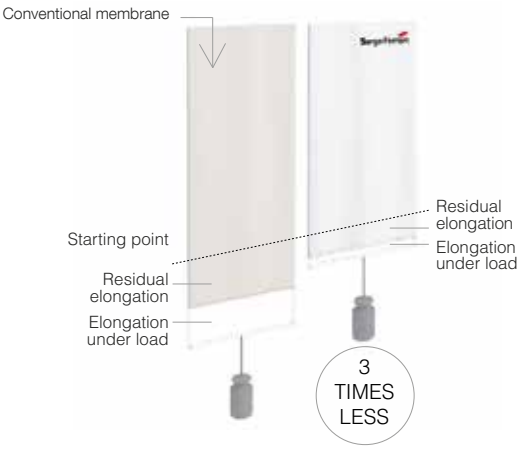
Précontraint® technology

The worldwide patented Serge Ferrari Précontraint® technology consists of pre-stressing the base cloth before and during all coating operations in both directions warp & weft.



Précontraint® technology

Conventionnal membrane:
Less protection against UV, pollution & abrasion
Reduced dimensional stability



Under tension during 100 hours -
Load: 200 daN/m (approx. 200 kg/m)
Traction in the weft direction
EN 15977

Précontraint® material benefits

- Exceptional dimensional stability to guarantee tension and homogeneity. Précontraint® allows welding warp to weft.
- Controlled consistency from batch to batch for better adequation of the membrane to the calculation and drawings.
- Enhanced mechanical longevity thanks to the thicker top coat protection on Précontraint® than on conventional material.



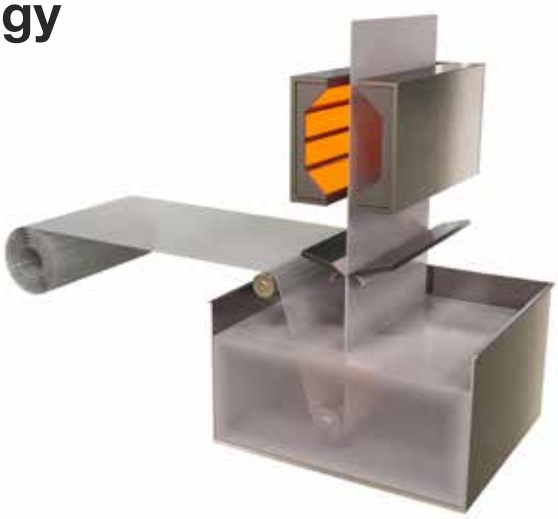
Smart dip coating technology

The smart dip technology allows to apply a multi-layer coating structure on fabrics which improves their durability and performance.

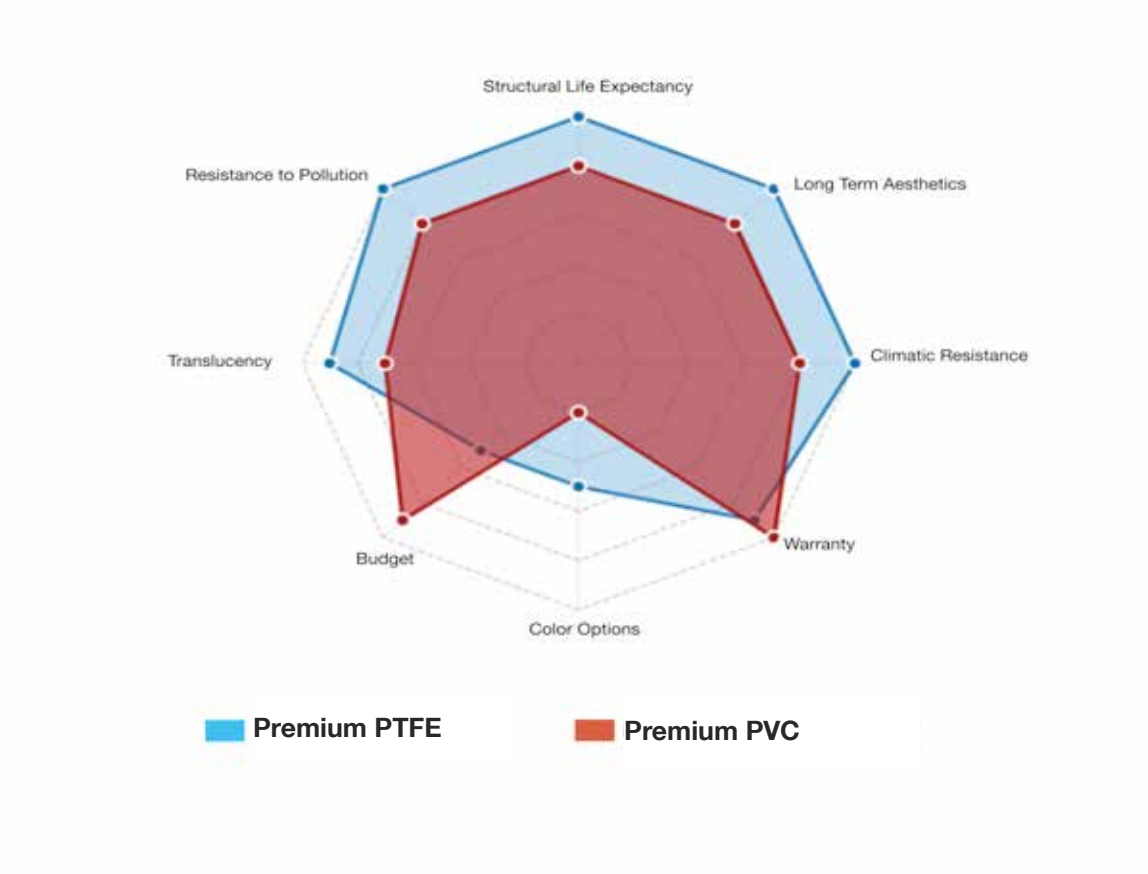
During the coating process the fabric is fully dipped into a bath of coating to ensure that all sides of the fabric are fully encapsulated by the coating.

A drying zone of a combination of thermal and IR heat systems ensures a controlled and homogenous heating process of the coated fabric.

In comparison to conventional coating techniques, the smart dip technology promotes the multi-layer PTFE coating on fiberglass fabrics with superior weather stability and extraordinary mechanical performance.



Premium range comparison





Smart Yarn technology

The Smart Yarn technology allows us to produce composite yarns with greater flexibility in development, providing a unique advantage when the product is used for certain dynamic markets such as furniture or acoustic inner liner.

This technology allows the combination of a central core, providing the desired mechanical properties, and a sheath, providing the desired appearance, finish, toughness and resistance properties.

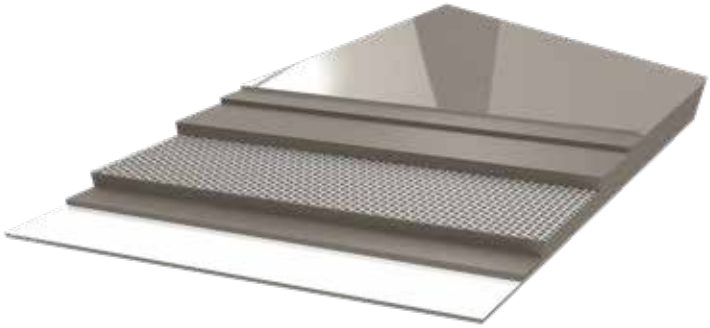
Smart Coating technology

Smart Coating technology allows us to manufacture products with outstanding properties:

Products that look and feel like leather have high resistance to abrasion and chemical attacks for a long service life.
Ideal for applications in high-use public places or demanding environments such as airports, hospitals etc.

Smart Coating technology reduces the weight of products (such as those destined for Yachting) and makes them more flexible.

Thanks to this technology, we can produce products with a foamy appearance (physical mousse and chemical) with unique characteristics in terms of insulation and impermeability.
We can also use a wide variety of coating polymers (PVC, PU, Acryl, Silicone, etc.).
Embossing is also possible in order to modify the final appearance of the product.

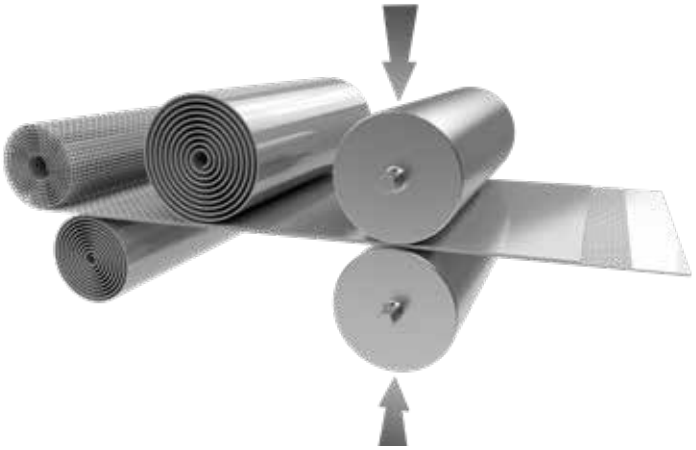


Smart Lam technology

Smart Lam is one of the latest technology we have just incorporated into our group.

This assembly technology allows composite materials to be produced by complexing.

The possibility of varying the materials used in a flexible production allows us to design innovative products or to confer additional performance properties to our flexible composite materials.



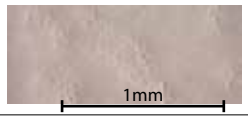


Premium quality

Tenseo Xtrem (TX30 & GF series)

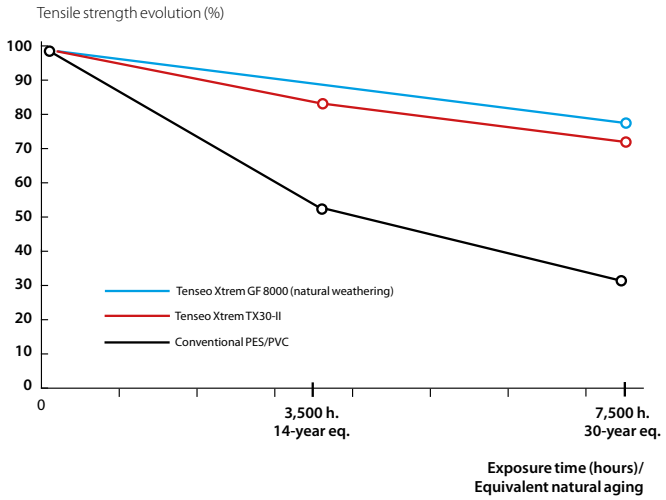
The Tenseo Xtrem TX30 range with Crosslink treatment combines mechanical and aesthetical performances for more than 30-year service life.

Extreme surface resistance

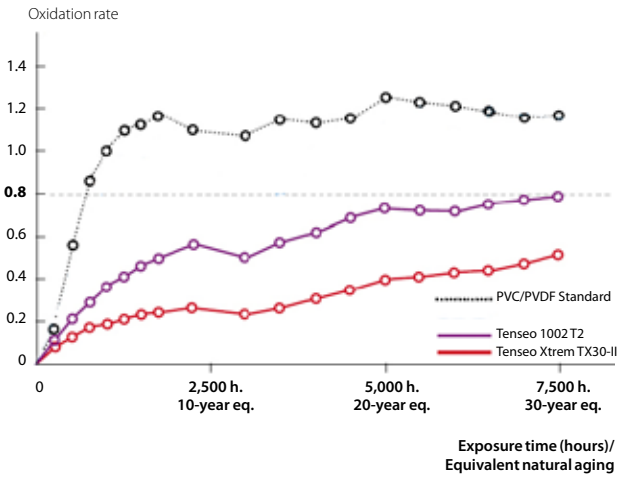
Product	Standard	High end & durable composites	
Top coat	Non Précontraint® Weldable PVDF	Tenseo Xtrem TX30 Crosslink Weldable after abrasion	Tenseo Xtrem Glass / PTFE Weldable with additional tape
Friction coefficient*	0.59	0.27	0.23
Accelerated weathering 4,500 h. - 18-year Florida Eq.			
Accelerated weathering 7,500 h. - 30-year Florida Eq.			
	Lots of microcracks and exposed yarns – Irreversible degradation	No microcracks Aesthetics is preserved Easy cleaning	No microcracks Aesthetics is preserved Easy cleaning

* a lower friction coefficient minimises the accumulation of dirt and pollution resulting in better cleaning properties.

Mechanical performance

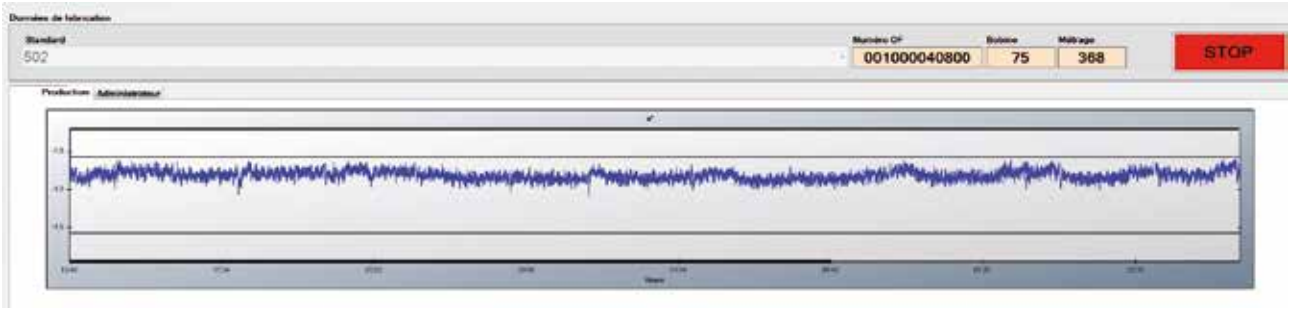


Surface oxidation



Visu Service for Précontraint® products

Natural light is a key criterion of tensile architecture, so it is essential to obtain a perfect homogeneity of color through transparency. Aware of this imperative, Serge Ferrari has developed a bespoke spectrophotometer embedded within production lines to precisely measure, control and adjust the color by transparency.



Visu Service: 3 benefits for your project

- **Beautiful end result:** assurance of measured, calibrated and traced homogeneity allowing the assembly of different batches.

- **Time savings** allowed by assembling material from different sources: fabricator stock, distributor stock, factory stock, new production batches. No need to systematically wait for a new production.

- **Material savings:** the ends of productions or ends of jumbo rolls are no longer discarded and take their place harmoniously in the next project.



Without Visu Service



With Visu Service

Premium comfort

Characterization of thermal, acoustic & natural light environments

Thanks to their flexibility and lightness, the Serge Ferrari composite materials lend themselves wonderfully to combinations of several skins to obtain a whole panel of functionalities and performances according to the requirements of the building. The materials are positioned as roofs, facades as well as interiors to ensure the continuity of the architectural choice.

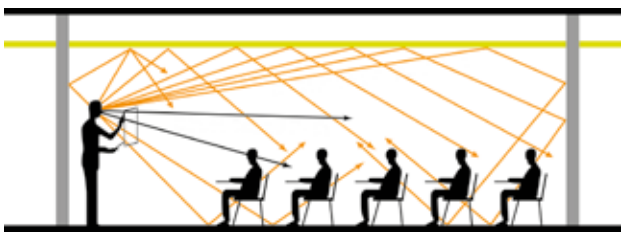
Product combination

Product name	Luminosity	Opacity	Thermal comfort	Acoustic comfort
1202 Opaque Dualtone + 702 Opaque Dualtone		••••	•••	•
1202 Opaque Dualtone + AW		••••	•••	••••
1202 Opaque Dualtone + insulation + AW		••••	••••	••••
TX30-III + 702 S2	••		••	•
TX30-III + AW Lux	•••		••	••••
TX30-III HTL + 402 HTL	••••		••	•
TX30-III HTL + AW Lux	••••		••	••••
GF 6000 + GFi 4000	••••		••	••
GF 6000 + SK20 LowE	•••		•••	•••
GF 7000 + SW	••		••	••••
STFE 50 + 1002S2 HTL	••••		••	•
381 + 1002S2 HTL + AW Lux	••••		•••	••••

•	••	•••	••••
Medium	Good	Very good	Excellent

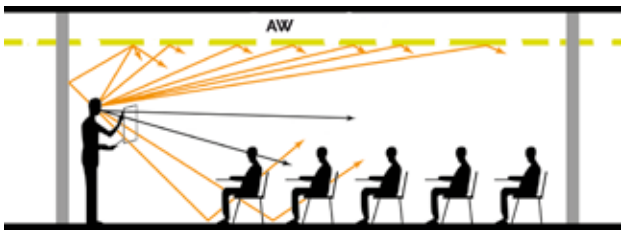
Acoustic comfort (Absoption)

Non-equipped premises



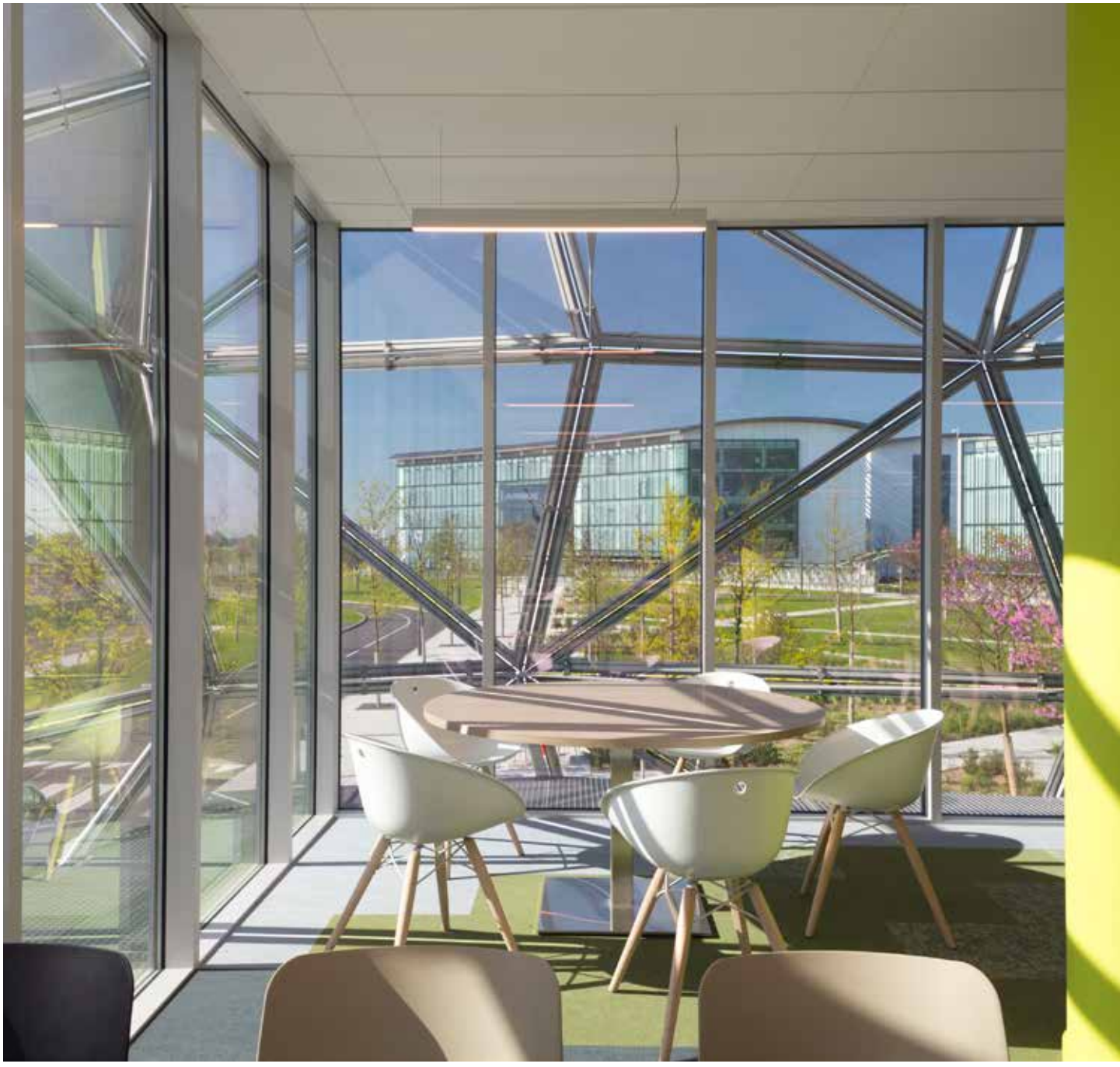
A room is "reverberant" when the sound is reflected by the enclosing surfaces. The sound level is then maintained and drops slowly after the sound source has stopped emitting.

Room equipped with Tenseo Comfort AW



A room is "weakly reverberant" when the sound is absorbed. The sound level drops quickly after the sound source has stopped emitting.

Visual comfort



Project :
Airbus Headquarters facade

Architect :
Calvo Van Tran

Membrane :
Tenseo Frontside 381
1,000 sqm

Completion date :
2017

- **Glare control & view through thanks to the Tenseo Frontside 381 mesh**

Selection guide for Tenseo range

Exterior plain fabric

Segment	Product name	Technicity	Possible colors	Durability	Opacity	Translucency	Transparency (view through)	Fire behavior	Technology	Type
Xtrem	STFE 50		no	•••			••••	•••	POLYAR/ FLUOP. P	II
	GF 8000	By Verseidag	yes	••••		••••		••••	G/PTFE	IV
	GF 7000	By Verseidag	yes	••••		••••		••••	G/PTFE	III
	GF 6000	By Verseidag	no	••••		••••		••••	G/PTFE	III
	GF 4500	By Verseidag	no	••••		••••		••••	G/PTFE	II
	TX30-V	Précontraint	yes	••••		•••		•••	PES/PVC	V
	TX30-IV	Précontraint	yes	••••		•••		•••	PES/PVC	IV
	TX30-III	Précontraint	yes	••••		•••		•••	PES/PVC	III
	TX30-III HTL	Précontraint	no	••••		••••		•••	PES/PVC	III
	TX30-II	Précontraint	yes	••••		•••		•••	PES/PVC	II
Advanced	GF 7006	By Verseidag	no	•••		••••		••••	G/PTFE	IV
	GF 6006	By Verseidag	no	•••		••••		••••	G/PTFE	III
	GF 4006	By Verseidag	no	•••		••••		••••	G/PTFE	II
	1502S2	Précontraint	yes	•••		••		•••	PES/PVC	V
	1502 Opaque Dualtone	Précontraint	yes	•••	••••			•••	PES/PVC	V
	1302S2	Précontraint	yes	•••		••		•••	PES/PVC	IV
	1202S2	Précontraint	yes	•••		••		•••	PES/PVC	III
	1202 Opaque Dualtone	Précontraint	yes	•••	••••			•••	PES/PVC	III
	1002S2 HTL	Précontraint	no	•••		••••		•••	PES/PVC	II
	1002S2	Précontraint	yes	•••		••		•••	PES/PVC	II
	1002 Opaque Dualtone	Précontraint	yes	•••	••••			•••	PES/PVC	II
	902S2	Précontraint	yes	•••		••		•••	PES/PVC	II
	702 Opaque Dualtone	Précontraint	yes	•••	••••			•••	PES/PVC	I
	TXA 750 F		yes	•••		••		•••	PES/PVC	I
Edition	T 1550		no	•••		••••		••••	G/PTFE	V
	T 1350		no	•••		••••		••••	G/PTFE	III
	T 1150		no	•••		••••		••••	G/PTFE	II
	T 850		no	•••		••••		••••	G/PTFE	II
	TXS 1100F		yes	••		••		•••	PES/PVC	III
	TXS 900F		yes	••		••		•••	PES/PVC	II
	TXS 700F		yes	••		••		•••	PES/PVC	I
	TXO 1150F		no	••	••••			•••	PES/PVC	III
	TXO 1050F		no	••	••••			•••	PES/PVC	II
	TXO 850F		no	••	••••			•••	PES/PVC	I

Exterior mesh fabric

Segment	Product name	Technicity	Possible colors	Durability	Transparency (view through)	Fire behavior	Technology	Type
Frontside	381	Précontraint	yes	•••	••••	•••	PES/PVC	I
	371	Précontraint	yes	•••	•••	•••	PES/PVC	I
	TXM 50		yes	•••	••••	•••	PES/PVC	I
	GFM 52	By Verseidag	yes	••••	••••	••••	G/PTFE	II
	GFM 21	By Verseidag	yes	••••	•••	••••	G/PTFE	II

Interior fabric

Segment	Product name	Possible colors	Durability	Translucency	Sound absorption	Fire behavior	Technology	Type
Comfort	SW	yes	•••	•	••••	•••	PES/PVC	II
	AW	yes	•••	•	••••	•••	PES/PVC	I
	AW Lux	no	•••	••••	••••	•••	PES/PVC	I
	GFi 4000	no	•••	••••		•••	G/FLUOP	II
	GFi 4000 LowE	no	•••	••		•••	G/FLUOP	II
	SK20	no	•••	••••	•••	••••	G/SILICON	I
	SK20 LowE	no	•••	••	•••	••••	G/SILICON	I

•	••	•••	••••
Medium	Good	Very good	Excellent



Our CSR approach

Our mission

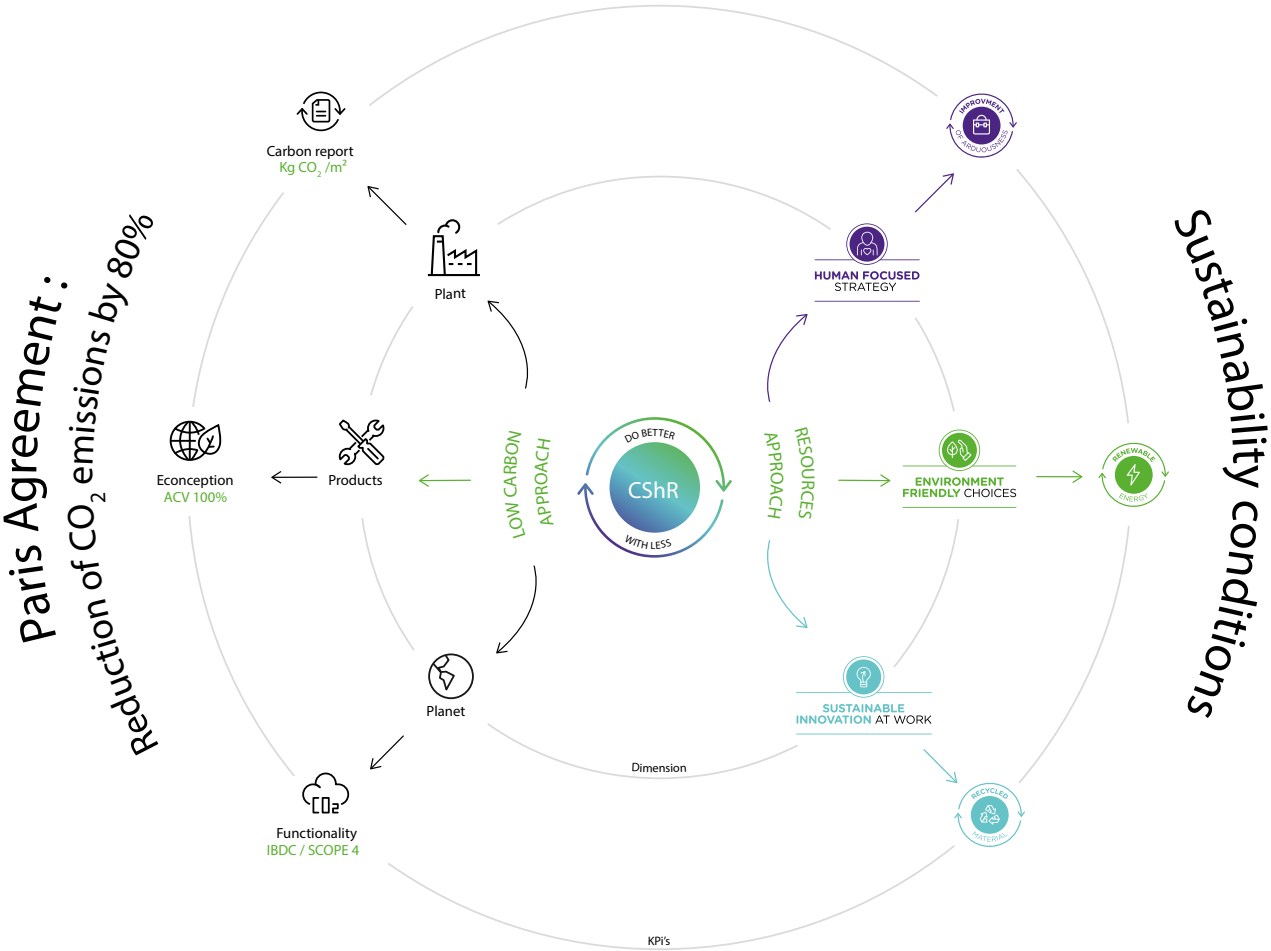
"Act now to build a better tomorrow"

Our CSR policy

Our CSR policy is based above all on the Human aspect of the company because our people are our principal resource, our biggest asset and the real power behind the development and renewal of the company. The objective is simple: to use collective intelligence to transform our industrial model today so that we can invent the products of tomorrow.

For us, this universal project is called - **CS-h-R**

Our CShR project is based on 2 additional approaches:



A project characterised by a strong commitment: to do better with less

6 measurable commitments

Low carbon approach

Sites

Carbon footprint
-30% reduction in carbon emissions compared to 2022

Products

Eco-design
-30%kg CO_2/sqm

Planet

Process
Evaluate the carbon tonnage avoided by using our products

Resources approach

HUMAN FOCUSED STRATEGY

Less risk
More qualification

ENVIRONMENT FRIENDLY CHOICES

Less fossil fuels
More renewable energy

SUSTAINABLE INNOVATION AT WORK

Less virgin material
More recycled materials

A project that answers a question

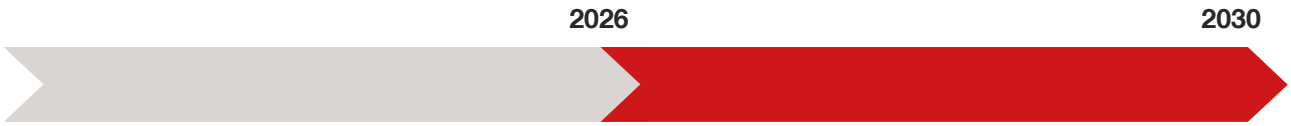
How can the Serge Ferrari Group's products provide a solution for tomorrow's world...

In the way they are manufactured?
Thanks to eco-design, the Serge Ferrari Group has already developed the Seemee Loop® fabric ranges (Sign) and Soltis Loop® (solar protection), made from 100% recycled materials.
The Group is also exploring the use of natural fibre membranes, such as linen and cotton, with Flexlight Natome 500 fabric (modular structure).

In the way they are used?
The Serge Ferrari Group offers solutions to ensure the comfort of users, the control of the building's interior temperatures and energy consumption. It also provides special membranes for applications such as fish farming, anaerobic digestion, the design of hillside reservoirs, mountain lakes but also the management of drinking water.

In what way are they an alternative?
When it comes to carbon-neutral buildings, composite membranes represent a credible and economical alternative to more traditional solutions such as metal or glass which leave a bigger footprint.

Our time-table



Today > 2026
Investments to transform the industrial facilities

2026 > 2030
Assessment of investments and actions carried out

2030
Meeting commitments



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