

Membrane structures  
flexible solution of the  
modern architecture





# MEMBRANE STRUCTURES

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Membrane Systems are large-scale industrial facilities, structures that can cover large areas, are fastset up, are resistant to severe working conditions, and force construction systems in terms of architecture and engineering.

Lightweight and easy to install and dismantle membrane systems are made from knitted fabric membrane material and are derived from reverse side curved surfaces with minimum surface and high strength carrier material. Unlike reinforced concrete structures, it is a building material that serves both as a carrier and as a cover, taking shape according to the restressing force generated by asymmetric tensile strength, not by pressure. It is a staple of norms of sanity that have been approved by the World Health Organization. Because it has an anti-bacterial surface plate on the surface, it does not hold bacteria.

In the structure of the Membrane Material there are synthetic fibres called weft and warp, which determine all static values. Above and below these are covered with PVC, PTFE or silicone materials.

Systems have advantages such as easy installation and disassembly and application in a very short time compared to industrialized construction systems and materials such as iron, concrete, reinforced concrete.

The application areas of the systems are quite extensive. Shopping centres, marketplaces, amphitheatres, parking areas are preferred in places such as.

# OUR PRODUCTS

The most important factor that makes Tensaform preferred in textile architecture and membrane shell structures is its turnkey approach from design to implementation. It has earned its place among the biggest companies of its industry not only in Turkey but also around the world in terms of project consulting, planning, manufacturing, assembly, service and maintenance for PCT, PTFE, ETFE membrane structures and steel and aluminum structures thanks to its rapid, creative and professional teams, its advanced machinery that meets today's needs, and a production capacity of 300,000 m2 for PVC, 150,000 m2 for PTFE and 100,000 m2 for ETFE.

1

## PVC & PTFE Shades

Stadiums, amphitheaters, tensile shades, tensile structures, inverse umbrellas, mall shade closures etc.

2

## EtfE Systems

It is among the most-preferred coating types in modern stadiums.

3

## Textile Mesh Facade Systems

Material texture, colors, sunshade feature, distant-close perception, various forms, all for more beautiful structures.

4

## Tensile Systems

Lightweight, durable and can be assembled/disassembled for multiple times, tensile systems.

5

## Moduler Systems

Many features such as water proofing, flame reterdanty and 1100 PVC Dtex yarns and hunderets of dfferent solutions.

6

## Rental Aluminium Modular Systems

In modern architecture, there are many places Aluminum Systems can be used. Such as fairs, events, organisations, concerts and many other places on our everyday life.



# 1

## PVC & PTFE SHADES

The cover material used in the membrane structures is a special type of fabric obtained by touching the fibres which are the main carriers of the membrane cover. Acrylic, PVDF (fluorine), non-weldable PVDF (100% fluorine) lacquer layer can be preferred in PVC coatings according to the feature of the used progeny. Alternatively, membranes coated with a Nano-technological TiO<sub>2</sub> layer can be used.

This TiO<sub>2</sub> layer is not a lacquer but a separate layer made on PVC. It contains active (photocatalytic) components with the sun's rays and keeps the white onion coming out for years.

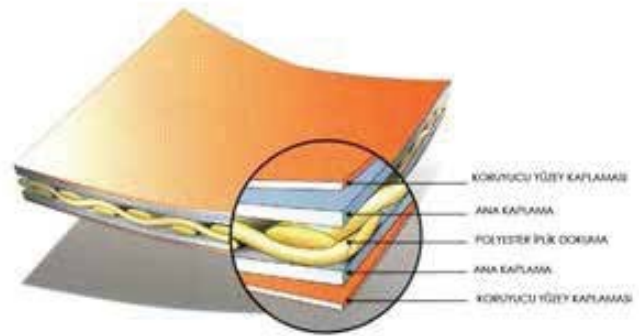
### PVC Coated Polyester Weaving;

Width up to 300cm

Easy to operate, economical to install

Various final floors

Acrylic lacquer,



Weldable PVDF (fluorine) lacquer, Non-weldable PVDF (100% fluorine) lac,

TiO<sub>2</sub> coating

Good light transmittance

Fire behaviour (DIN 4102 B1 ...)

Commercial life 20 years

Due to the special low-wick yarns used in textures, the water from the edges of the membrane and the contaminants brought by it are less accessible.

Special PVC composition coated on polyester fabric, as well as preventing fungal and mold

formation, adhesion values increase the safety of welding resources.

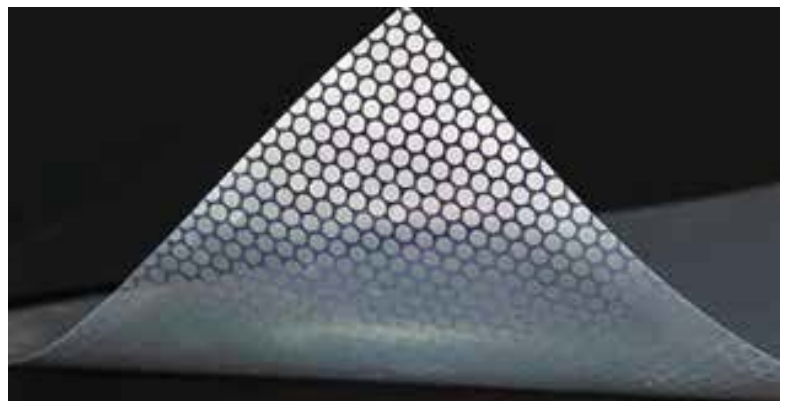






# 2

## ETFE SYSTEMS



ETFE (Ethylene Tetrafluoroethylene) is a fluoropolymer-based material. It is usually applied in 2 layers with 3 layers, in the form of inflatable air cushions, sometimes in the form of a single wall. ETFE material is very thin and lightweight. Approximately 1% of glass is weightless and there is no risk of breaking like glass film. When air inflatable system is used, the resistance increases very much.

ETFE Systems are mounted on the carcass frame system with special Aluminium profiles. Blower machines in inflatable cushion systems are able to feed the inflatable cushion system continuously by entering the system again when extra pressure is required in any illegally fed system.

ETFE cushions provide maximum benefit from daylight as well as heat insulation.

ETFE systems offer suitable solutions for all kinds of roof and façade structures

such as shopping malls, big roofs, skylights, show centres, hotels, social facilities, sports facilities, airports and stadiums.

### Advantages of the ETFE system;

- Transparency and Lightness,
- High Heat Insulation,
- High Workability,
- Fire resistance,
- The self-cleaning feature,
- Outstanding durability,
- The interior has natural skylights,
- Eco-friendly,



High heat insulation



Lightness



High heat insulation



Elasticity feature



Self-cleaning feature



Long life



Acoustics

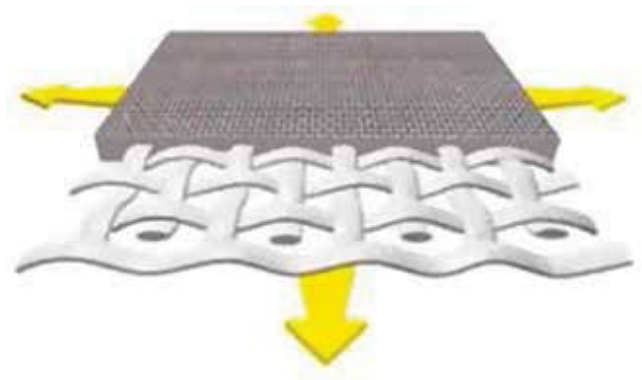




# 3

## TEXTILE MESH FACADE SYSTEMS

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Textile facade is a new category in screens and fabric architecture used on exterior facades of buildings. It can be easily applied on both old and new buildings, and used for many structure types from industrial buildings to malls, stadiums and housing structures. Textile Facade coating applications are carried out by applying statically resistant and guaranteed import textile products of ETFE materials or textile materials

including flat (closed), pvc, mesh, PTFE (Teflon) laminated and/or mesh by aluminum and/or specially-designed tensioning apparatuses, special to the steel construction designed for facade, during or after constructing the building.

These systems, which are used in line with the necessities of sunshade function, shading and heat insulation, and light permeability that must be perceived differently from inside and outside (night-day, inner-outer, distant-close appearance), are also attractive with their convenience of application and their economic costs.





Creative design



Compatibility of different materials



Sunshade



Energy saving



Affordable



Fabric Architecture



Durable and lightweight



## OUR TEAM

This innovative partnership spirit takes its strength from being supported by an expert team and high technology also, gathering architectural and engineering disciplines together.

### Project department

6 Civil Engineers, 4 Architects,  
4 Technicians

### Marketing, Administrative affairs ve PR departm

10 Staff

### Steel Manufacturing Department

1 Civil Engineer, 2 Technician,  
23 Manufacturing Staff

### Membrane Manufacturing Department

3 Civil Engineer, 4 Technician,  
60 Manufacturing Staff

### Quality Control Department

2 Staff

### Assembly Department

2 Civil Engineer, 4 Technician,  
15 Supervisors and 20 Installation  
Personnel



**Project department**  
14 Staff



**Marketing Administra-  
tive Affairs and HR  
Department: 10 Staff**



**Steel Manufacturing  
Department:  
26 Staff**



**Membrane Manufactur-  
ing Department:  
67 Staff**



**Quality Control Depart-  
ment: 2 Staff**



**Assembly Department:  
41 Staff**

# OUR SERVICES

## 1 Project Consulting

Designing 3d setup modeling, draft project analysis, detail development, mock up preparing, material selection, technical specifications preparing, process and assembly methodology, creating a budget are our services given by our expert team.

## 2 Project Design

We believe that creation dreams of architects, spatial designers and investors should never be prevented by any means. We are trying to assist our customers in how they can make their wishes come true, rather than telling them what not to do. We are trying to provide the most ideal concept solution by collaborating in order to find the best solution with our customers or solution partners wishing to have more information.

## 3 Fabrication

Our factory located in Tekirdağ/Malkara is the world's biggest textile membrane processing facility with a 6000m<sup>2</sup> indoor and 4000m<sup>2</sup> outdoor areas, and provides solution for textile architecture projects both in Turkey and around the world with its most advanced machinery (5m and 3 m width cnc cutting counters, special production etfe welding machines, modern High Frequency (HF) machines,

Teflon ironing and pressing machines in all sizes), its experienced engineers and trained personnel, and with an annual 300,000 m<sup>2</sup> PVC, 150,000 m<sup>2</sup> PTFE, 100,000 ETFE processing capacity.

## 4 Assembly

We are carrying out our reinforced concrete anchorage, steel construction and membrane cover assembly within our company in a controlled manner and by keeping our health and safety inspections on highest levels. We are providing all kinds of opportunities for our experienced, trained teams and technicians to produce a high-quality field product in compliance with the assembly diagrams provided to them, and by following the construction site rules tin suitable processes and with necessary equipment and tools.

## 5 Service and Maintenance

We generally provide a two-year warranty for the manufacturing and assembly errors of steel construction and membrane cover for works manufactured and assembled by us. Then, if requested (particularly in ETFE applications), we carry out semi-annual maintenance, repair and part renewal processes in order to render the steel+membrane and ETFE cover systems to be much more durable by our special maintenance and service agreement.



# MEMBRANE FABRICATION

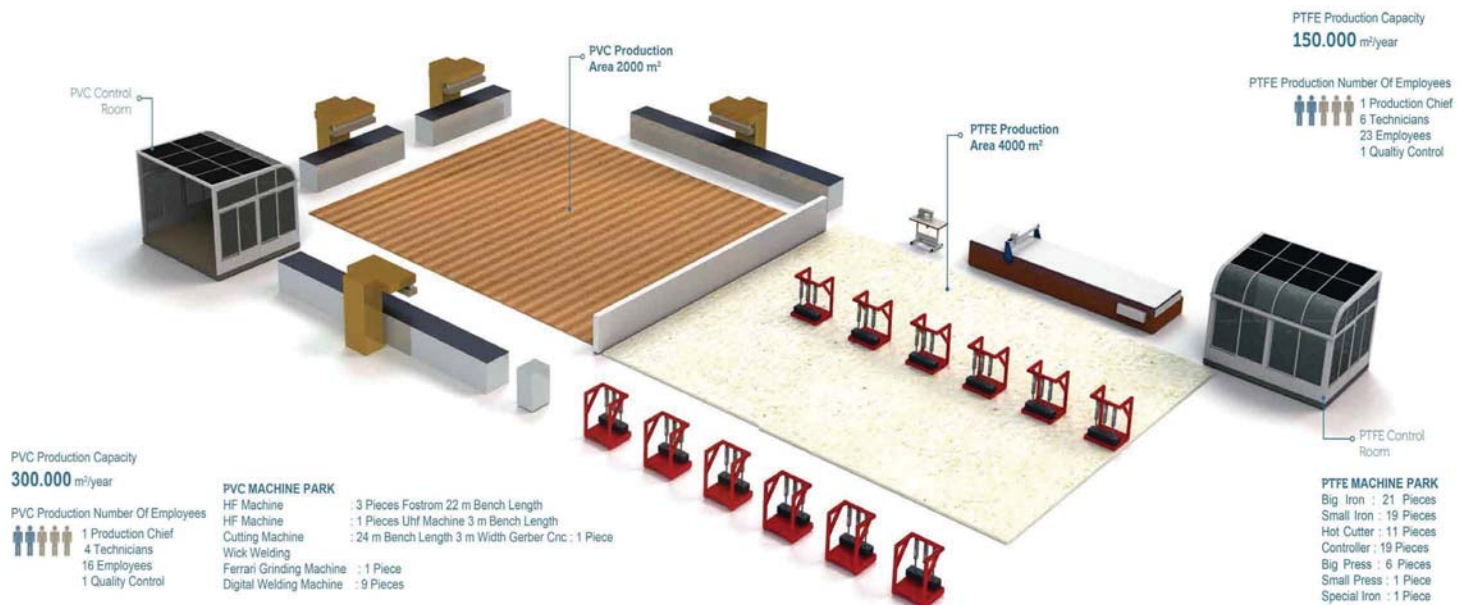


As Tensaform, our main purpose is to build environment-friendly, long-lasting and aesthetic membrane structures. In this rapidly emerging sector, we apply the state-of-art production methods with a creative approach in the production of textile membrane structures.

In 2013 year to increase the manufacturing capacity of teflon covered fibre glass weaved

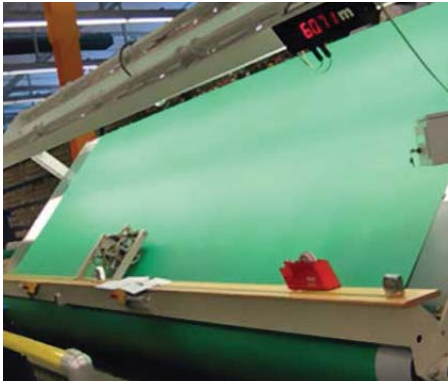
(PTFE) membrane and PVC covered polyester yarn weaved membrane and to give a better service to our customers by modernizing the machinery; our new factory is pressed into service which is in Malkara organized industrial site that has a total area of 10000 m2 and 5000 m2 closed membrane cover manufacturing area.

Management, technical office, administrative divisions, manufacturing plant, open and closed stock area are giving service inside our new facility that has 5000 m2 closed and 5000 m2 open area.

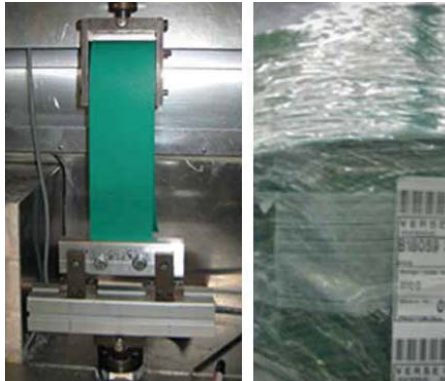




# PTFE FABRICATION



① Surface inspection



② Static strength test



③ Cutting



④ Feb film pasting



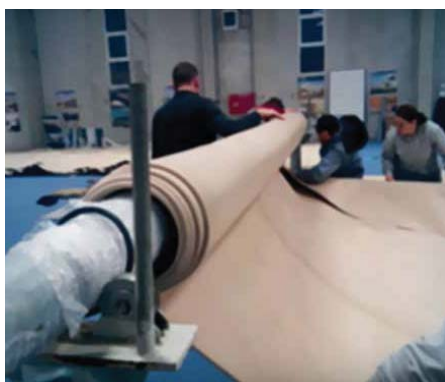
⑤ Ironing



⑥ Measurement Control



⑦ Hot bar press welding



⑧ Packaging



⑨ Shipment

# ETFE FABRICATION



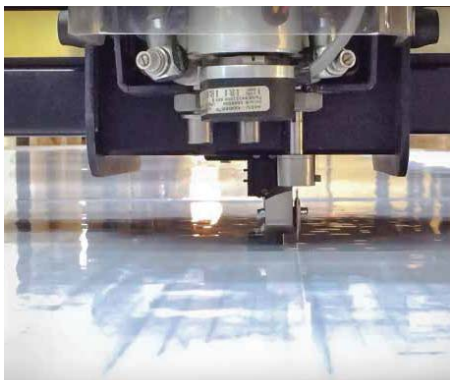
① Material template



② Cnc cutting preparation



③ Dimensionally controlled placement



④ Cutting



⑤ Sticking



⑥ Internal rope connection



⑦ Bonding



⑧ Roving



⑨ Packaging and shipment



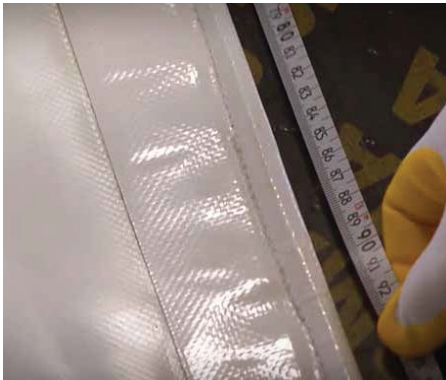
# PTFE FABRICATION



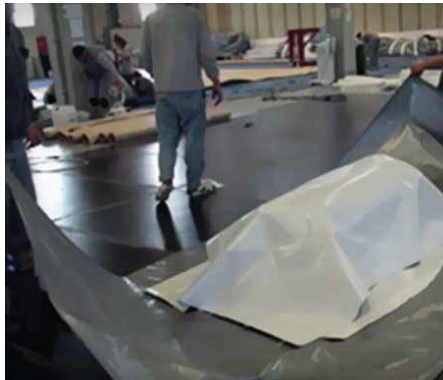
① Surface inspection and cutting



② Sticking



③ Measurement Control

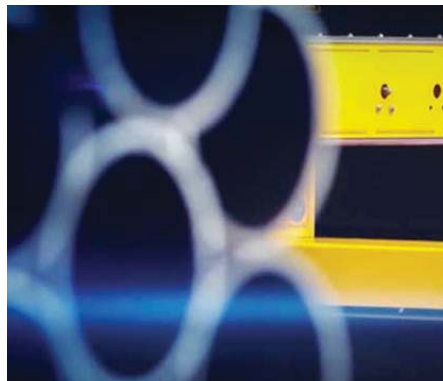


④ Packaging



⑤ Shipping

# STEEL FABRICATION



① Material template



② Cnc cutting preparation



③ Cutting



④ Sticking

# MEMBRANE INSTALLATION



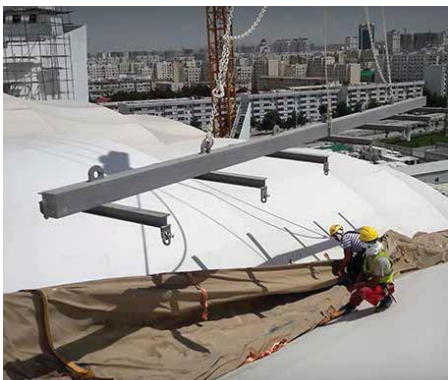
①



②



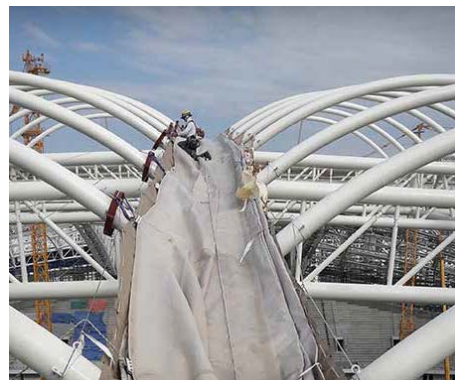
③



④



⑤



⑥



⑦



⑧



⑨



# ETFE FILM INSTALLATION



①



②



③



④



⑤



⑥



⑦



⑧



⑨



# SOME OTHER REFERENCES



Türkmenistan Olympic Complex 2016



Bursa Crocodile Arena Stadium 2016



Medine King Abdulaziz Airport 2016



Gaziantep City Stadium 2016



Konya City Stadium 2016



Trabzon Akyazi Stadium 2016



Vakıfbank Sport Palace 2016



Havelsan ETFE Roof 2016





Baku European Games Park

2015



Antalya Expo 2016

2016



King Halid Airport Carpark

2016



Konya Butterfly Museum

2015



North Ankara City Landscape Awnings

2013



Antalya Erasta AVM

2014



İstanbul Axis AVM Facade

2013



Turkmenbashi Yac Marina

2012

# Membrane structures flexible solution of the modern architecture



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