

MEMBRANE<sup>®</sup>



*Banks Sails  
the driving force*



# Banks Sails

**Banks Sails** based in Bari, Italy, originates in 1990 from the reorganization of the *Bruce Banks Sails group*, born in the UK in the 60's. After more than 25 years of activity, is now expanding across the European boundaries.

The group is headed by **Paolo Semeraro**, an Italian hydraulic engineer, former Olympic and America's Cup sailor, who is still actively sailing at the highest international level.



Outstanding *race winning experience* combined with *hydraulic mechanical and material knowledge* allowed **Banks Sails** Europe to develop new sailmaking techniques and materials.

**Banks Sails** has an ever growing number of sailmaker's and service points on Italian, European and international territory.

Numerous world, European, national and Italian titles that have been won using our **MEMBRANE** (TM) technology, the increasing number of prestigious cruising yacht equipped with **MEMBRANE** (TM) are the sign of a successful, innovative, creative and forward looking company, focused to offer more and more fashionable, durable and performance sails:  
a 100% European product for the global market!



## THE DESIGN PROCESS

An accurate sail design is the first step of the **MEMBRANE** integrated **Banks Sails** proprietary system.

**Banks Sails** software has been created exclusively for our designer's needs and requirements.

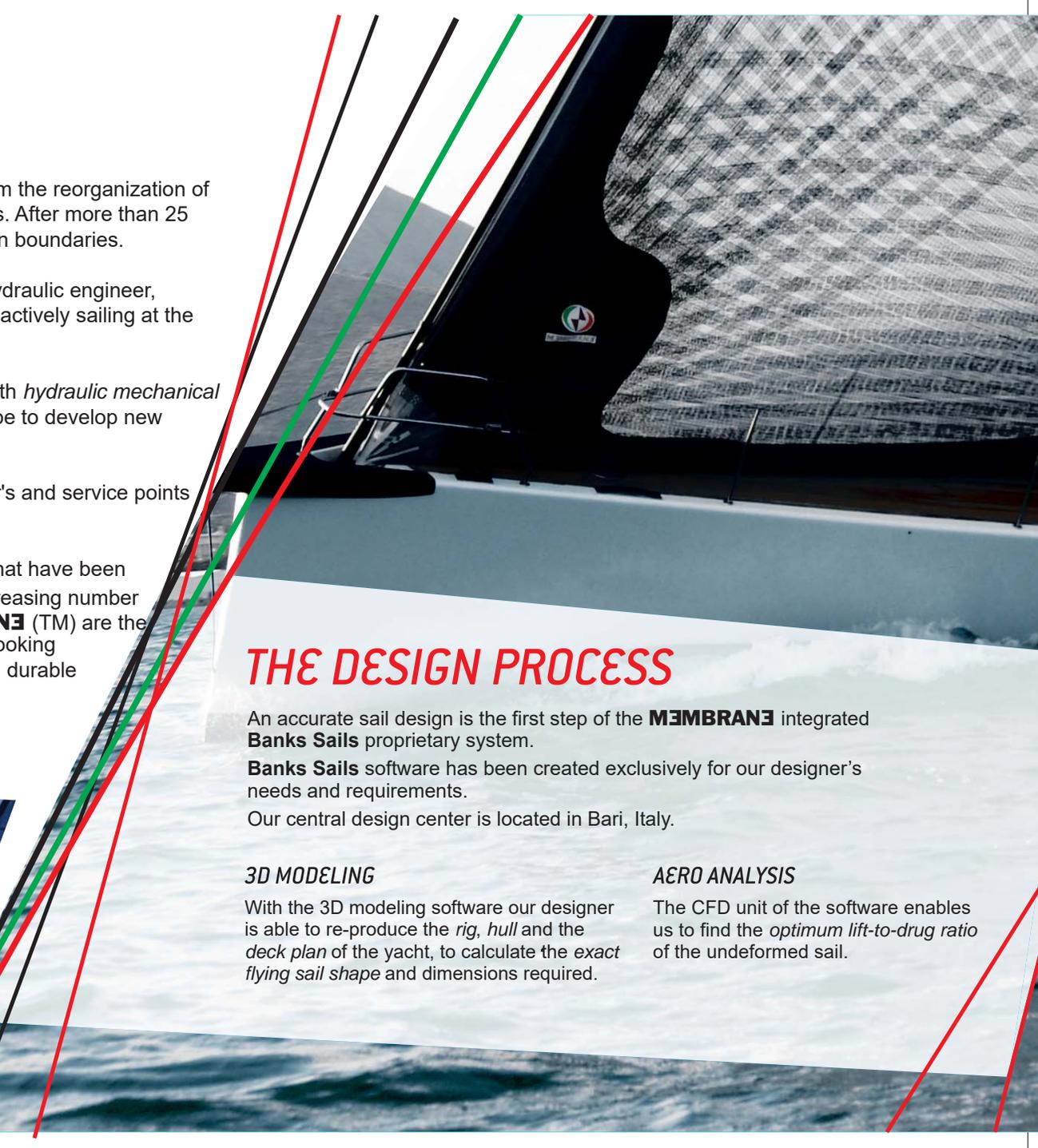
Our central design center is located in Bari, Italy.

### 3D MODELING

With the 3D modeling software our designer is able to re-produce the *rig*, *hull* and the *deck plan* of the yacht, to calculate the *exact flying sail shape* and dimensions required.

### AERO ANALYSIS

The CFD unit of the software enables us to find the *optimum lift-to-drag ratio* of the undeformed sail.



### 3D FIBER LAYOUT

Futuristic structures in continuous evolution follow the natural load and stress path.

In the sail every single line, every curve satisfies specific structural needs, both aesthetic and functional.

### AEROELASTIC ANALYSIS

Our finite element software (FEA) calculates the deformed sail shape with wind and rig loads applied.

Then CFD analysis calculates lift to drag ratio and CP position for the deformed (real) sail.

### ON WATER TESTING

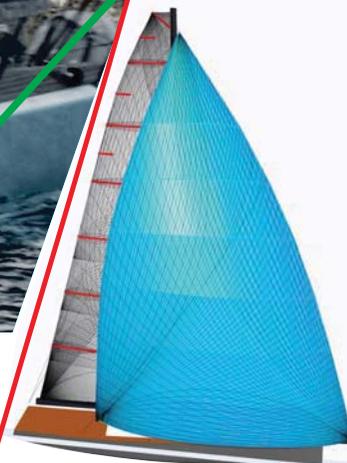
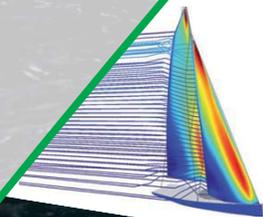
The **Banks Sails**, lamination facility is next door to the design center and sail-loft.

The close loop between design, lamination, manufacturing and on the water testing is the key to fast track winning development process.

Sometimes only few hours separate an idea from the actual on the water sailing.

Ultimately Banks Sails sailors are the real glue between *design*, *sea* and *technology*. Design is nothing but fixing ideas conceived by experienced and talented men.

with Dyneema Carbon



MEMBRANE<sup>®</sup>

  
Banks Sails Europe

# MEMBRANE

**MEMBRANE** is not only a specific material made by our innovative and exclusive technologies, but a different approach to the building process of a sail with no dimensional limits:

**MEMBRANE** is *art, science, technology, craftsmanship*.

In the **Banks Sails**, lamination facility of Bari (Italy), one of the largest in Europe, we produce up to 30mX6m light and strong advanced sails panels.

Combinations of *the best raw materials* merge into our sails thanks to high pressure flat lamination.



**Banks Sails Europe**

## The process

### 1 FIRST SKIN AND FIBERS LAY DOWN

A first skin - Mylar film, taffeta or the new **REVOLUTION** - is laid flat on the lamination surface. An automatic head lays the fiber curved in the defined paths.

While the most of the internal filaments remain dry and soft to folding, the fiber outer surfaces are glued together for the best grid resistance.

### 2 TWO COMPONENTS GLUE LAYER APPLICATION

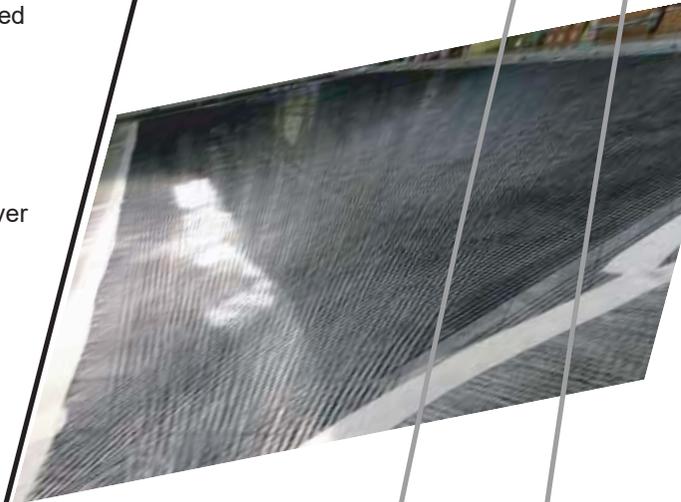
Our specialized Polyester two component glue reduces the amount required in the lamination process: this way we get stronger, lighter material. The bonding process, different from the thermoplastic processes, is no more reversible.

### 3 SECOND SKIN LAY DOWN AND VACUUM APPLICATION

Powerful vacuum pumps suck the air out of the two sealed skins.

### 4 ONE PASS HEATING PROCESS

**MEMBRANE** uses infrared variable temperature lamps whose purpose is to liquefy the resin, not to activate it. The lamps pass over the full width of the table so the uniformly heated with no distortion.



**5** *HIGHPRESSURE*

High pressure rollers follow the infrared lamps, eliminating the air pockets, applying up to 90.000 kg/mq, compacting the various layers, thus allowing great fiber concentration in the maximum load corners.

High Pressure is an essential key point in laminating Dyneema fibers into the **REvolution and iREvolution MEMBRANE**

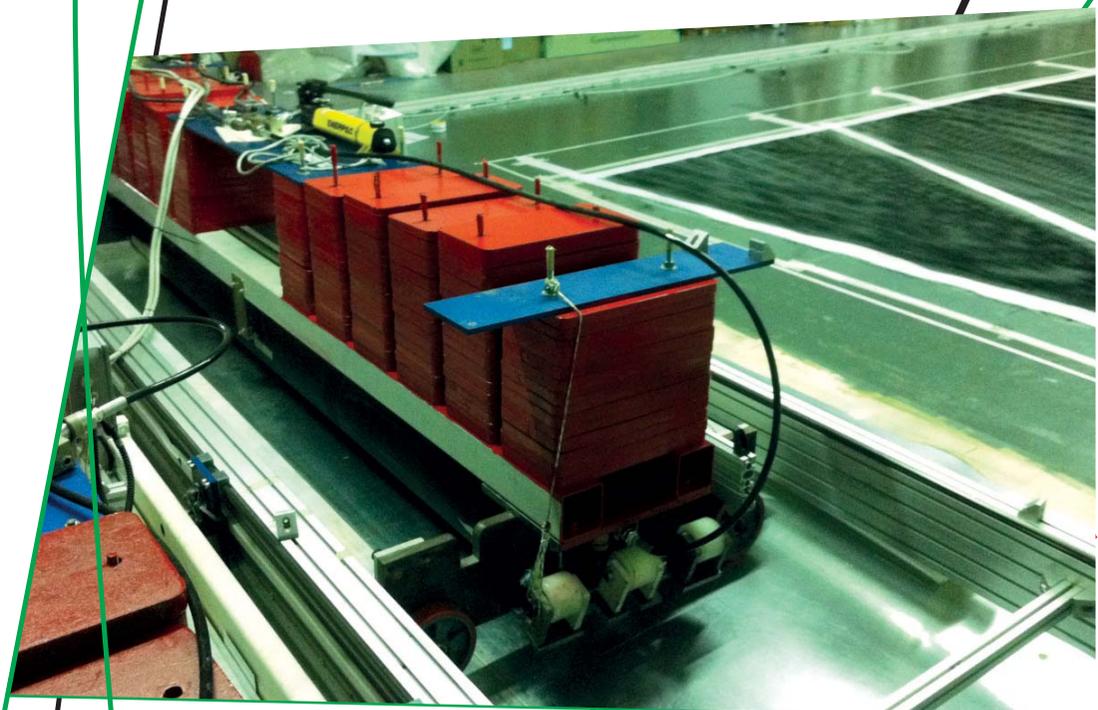
**6** *FLAT VACUUM COOLING PROCESS*

We match a monolithic composite material avoiding all the alterations which may be caused by the thermo-moulded 3d laminations.

For Dyneema membranes the post-curing process may last up to several days.

**7** *CURVES DRAWING ON A STABILIZED FLAT MATERIAL*

This important key point allows the repeatability of a winning design as well as the perfect symmetry of the sail on both tracks. The final shape is **not** dependant on being distorted over a 3D mold.



with Dyneema Carbon

**MEMBRANE**



**Banks Sails Europe**

## Racing

### RACE P

Skins: mylar film 0,5mil e 0,75 mil.  
Internal fibers: Black or white hi-tenacity polyester.  
Users: One design and small club racer.  
Grid: Light black or white polyester.

### RACE K

Skins: mylar film 0,5mil, 0,75mil, 1mil.  
Internal fibers: High modulus yellow aramid.  
Users: Big One Design and medium club racer.  
Grid: Yellow aramid.

### RACE S

Skins: mylar film 0,5mil, 0,75mil, 1mil.  
Internal fibers: balanced mix of Carbon and high modulus yellow aramid.  
Utilizzatori: medium to large cruiser-racer.  
Grid: Yellow aramid.

### RACE Q RACE Qos

Skins: mylar film 0,5mil, 0,75mil, 1mil - single internal taffeta.  
Internal fibers: balanced mix of Carbon and high modulus black aramid.  
Users: Medium/big racer and racer-cruiser.  
Grid: Black ramid.

italian design  
and production



## Cruising

### CRUISE P

Skins: light taffeta white or grey.  
Internal fibers: High tenacity polyester black or white.  
Users: small cruisers.  
Grid: Polyester black or white.

### CRUISE K

Skins: light or heavy taffeta white, grey, black.  
Internal fibers: High modulus yellow aramid.  
Users: Medium cruisers.  
Grid: Yellow aramid.

### CRUISE S

Skins: light or heavy taffeta white, grey, black.  
Internal fibers: Balanced mix of carbon and high modulus yellow aramid.  
Users: medium to large cruisers with carbon mast.  
Grid: Yellow aramid.

### CRUISE Q

Skins: Light or heavy, white, grey, black.  
Internal fibers: Balanced mix of carbon and high modulus black aramid.  
Users: Medium to large fast cruisers, with carbon mast.  
Grid: Black aramid.

### CRUISE V

Skins: Light/heavy taffeta, white or grey.  
Internal fibers: Balanced mix of Carbon and Vectran.  
Users: Medium/large offshore cruiser.  
Grid: Vectran

Cruise **MEMBRANE** are ideal also for in-mast and in-boom furling mainsail

### CODE 0

Skins: one side colored taffeta/ 0,5 mylar film/ structural skin  
Internal fibers: Poliester, Aramid, Dyneema, Carbon.



## Megayachts Sails

### MEMBRANE® Dyneema®

#### High performance, longevity and luxury cruising

Double or triple lamination process that grant us to obtain lightness and strenght.

Skins: white grey, double external or internal taffeta laminates.

With double or triple lamination.

Internal fibers: full Dyneema (Sk 75-78-90) eventually mixed with aramid and/or carbon fiber.

Grid: Dyneema Sk 75/78.

Users: Megayachts

# MEMBRANE

These are the reasons why

MEMBRANE® Cruise (Dyneema®)

Is the only possible choice for performing cruising yachts for durability and performances

## REVOLUTION

## iREVOLUTION

### II The iREVOLUTION comes from Italy

**Banks Sails** invents a new **MEMBRANE** in which the skin play a very important role in maintaining the shape and integrity of the sail over time. The structural skin, in combination with the advanced system of high pressure and temperature lamination and a long period of postcure, allow the extensive use of dyneema, carbon and black aramid fibers, guaranteeing the indestructibility of the sail.

**REVOLUTION**: from the eye-catching gray-matt look, external structural skin combined with dyneema fibers, carbon and black aramid, is the exclusive product for thrust regatta, the lightest and fastest sails on the world market, suitable for inshore or coastal.

**iREVOLUTION**: from the eye-catching black shining look, internal structural skin, dyneema fibers, carbon and black aramid, is the perfect product for offshore racing and cruising performance.

best seller



Suitable for both  
cruising and racing



Banks Sails Europe

 Banks Sails

*"Real progress happens only when advantages of a new technology become available to everybody"*

**MEMBRANE®**

**REVOLUTION iREVOLUTION**

**Banks Sails point:**

NORTH AMERICA

BENELUX

COSTA AZZURRA (FR)

GERMANY

GREECE

ITALY

MALTA

NORWAY

POLAND

RUSSIA

SPAIN

TURKEY

UKRAINE

UNITED KINGDOM

**Italian's Point:**

ANCONA

GENOVA

LIGNANO

MESSINA

NAPOLI

ROMA

VIAREGGIO

**BARI (central loft)**

info@bankssails.it

tel. 080 531 3830

tel. 080 531 3831



[www.bankssails.eu](http://www.bankssails.eu)