

MEMBRANE[®]

with Dyneema Carbon



Banks Sails

Banks Sails

Banks Sails EU was created from the reorganization of Bruce Banks Sails, one of the oldest sailmaking brands in the world originally founded in 1962 by Bruce Banks.

The group is technically 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 to develop new sailmaking techniques.

A wide number of Banks Sails production lofts and service points are distributed in Italy and European territories.

Numerous World, European and National titles that have been won using membrane technology, the increasing number of prestigious cruising yachts equipped with MEMBRANE is the sign of a successful forward looking company that is innovative, creative and focused towards the European market: a European product for the European 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 centre is located in Bari-Italy.

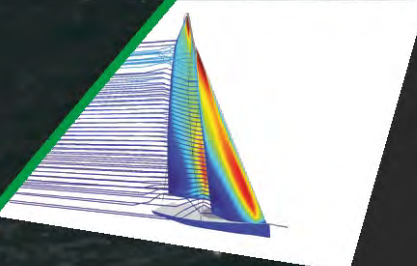
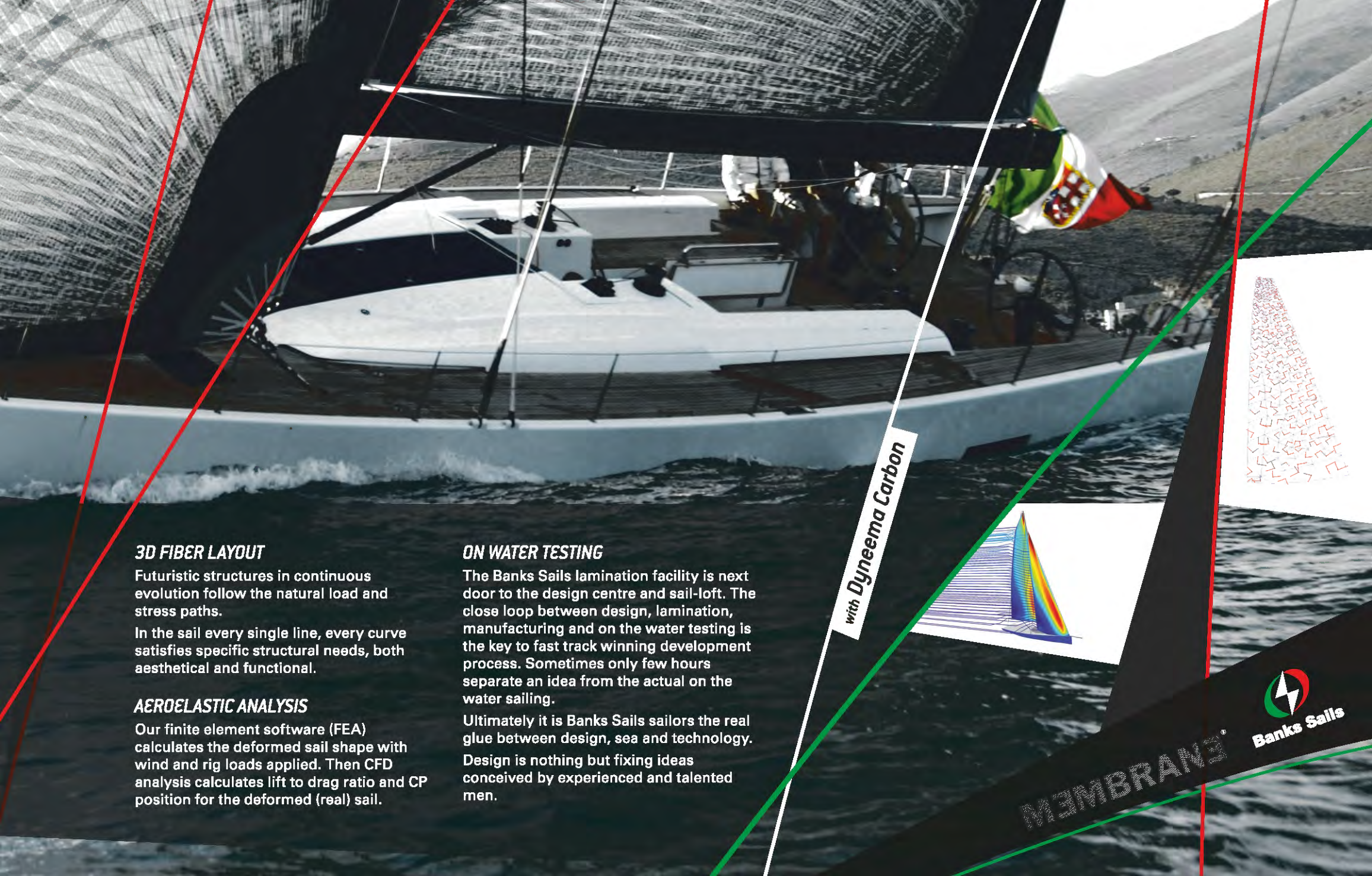
3D MODELING

In 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.





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3D FIBER LAYOUT

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

In the sail every single line, every curve satisfies specific structural needs, both aesthetical 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 centre 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 it is Banks Sails sailors the real glue between design, sea and technology. Design is nothing but fixing ideas conceived by experienced and talented men.

MEMBRANE[®]



MEMBRANE

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

MEMBRANE is ART, SCIENCE, TECHNOLOGY and CRAFTSMANSHIP.

In the Banks Sails lamination facility of Bari (Italy), one of the largest in Europe, we produce up to 30m x 6m light and strong advanced sail panels.

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

The process

1 FIRST SKIN AND FIBERS LAY DOWN

A first skin, Mylar film or taffeta, is laid flat on the lamination surface.

An automatic head lays the fiber curved on the defined paths.

While 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 components glue reduces the amount required in the lamination process: this way we get stronger lighter material.

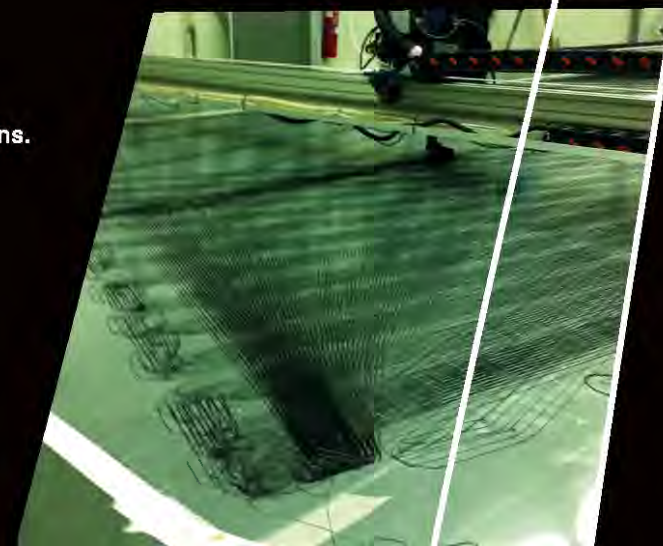
The bonding process, differently from the thermoplastic processes, is no more reversible.

3 SECOND SKIN LAID 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 over the full width of the table so the material is uniformly heated with no distortion.



5 *HIGHPRESSURE*

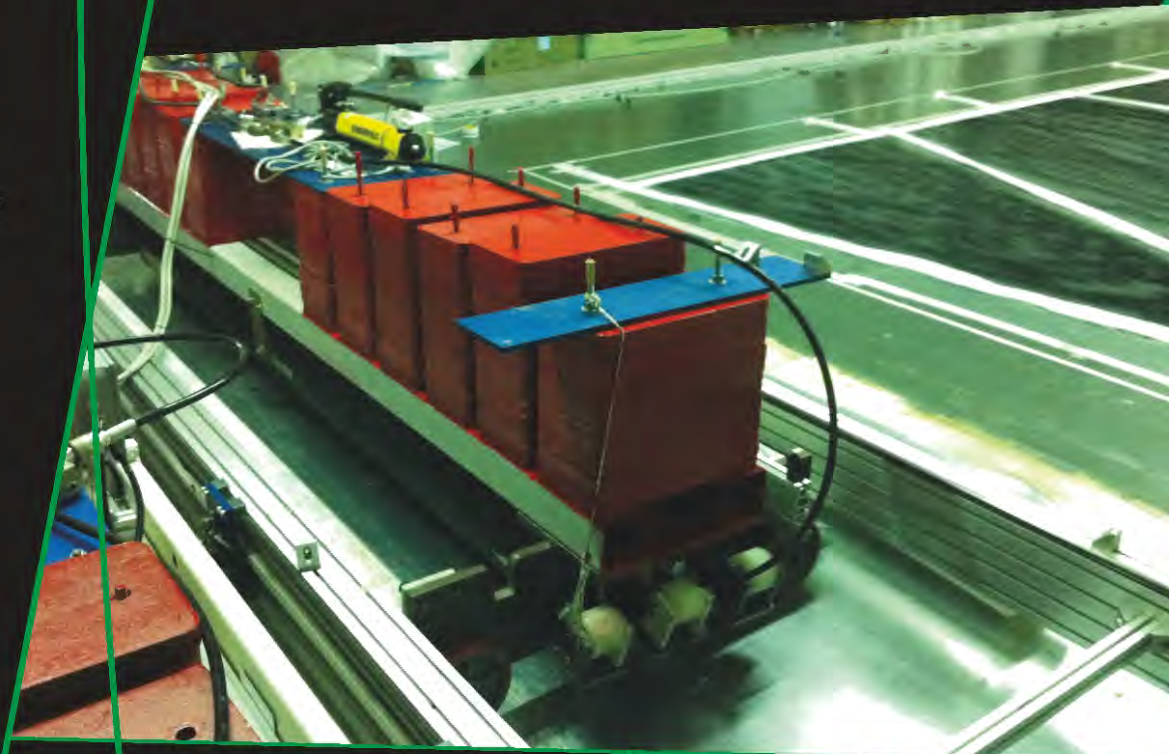
High pressure rollers follow the Infra Red lamps, eliminating the air pockets, applying up to 90.000 kg/mq, compacting the various layers, thus allowing great fiber concentration in the maximum load corners
High Pressure is an essential key point in laminating Dyneema fibers into the MEMBRANE.

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 tacks. The final sail shape is NOT dependant on being distorted over a 3d mould.



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MEMBRANE®



Racing

RACE P

Skins: Mylar film up to one (1) mil.
Internal fibers: black or white hi - tenacity polyester.
Users: One design and small club racers.
Grid: light W & B polyester.

RACE K

Skins: Mylar film up to one (1) mil.
Internal fibers: yellow Aramid hi modulus.
Users: Yacht One Design and medium size club racers.
Grid: light or heavy yellow Kevlar.

RACE S

Skins: Mylar film up to one (1) mil.
Internal fibers: 60/40 CARBON AND YELLOW KEVLAR.
Users: medium to large size cruiser-racers.
Grid: light or heavy yellow Kevlar.

RACE Q

Skins: Mylar film up to one (1) mil.
Internal fibers: 80/20 CARBON AND BLACK KEVLAR.
Users: medium to large Grand Prix racers and racer-cruisers.
Grid: light or heavy black Kevlar.

RACE QD

Skins: Double internal taffetà for offshore racing
Internal fibers: 60/40 CARBON AND DYNEEMA SK90.
Grid: Dyneema sk75 and sk78.

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Cruising



CRUISE P

Skins: white, grey double external or internal taffetà.
Internal fibres: black or white high tenacity Polyester.
Users: small cruisers.
Grid: light white polyester.



CRUISE K

Skins: white, grey double external or internal taffetà.
Internal fibers: YELLOW KEVLAR HIGH MODULUS.
Users: medium size cruisers.
Grid: light or heavy yellow Aramid.



CRUISE S

Skins: white, grey double external or internal taffetà.
Internal fibers: 60/40 CARBON AND YELLOW KEVLAR.
Users: medium to large size cruiser with carbon mast.
Grid: light or heavy yellow Aramid.



CRUISE Q

Skins: white, grey double external or internal taffetà.
Internal fibers: 80/20 CARBON AND BLACK KEVLAR.
Grid: light or heavy black Kevlar.



CRUISE D and **CRUISE QD**

Skins: white, grey double external or internal taffetà.
Internal fibers: DYNEEMA SK75 – 78.
Users: medium to large offshore cruisers
Grid: Dyneema sk75 and sk78

Cruise MEMBRANES are ideal also for In-mast and In-boom furling mainsails.

CODE 0

Skins: colored one side Taffeta / 0.5 Mylar film one side.
Internal fibres; Polyester, black Aramid, Dyneema, Carbon.



MEMBRANES®



- 1st Maxi Rolex Cup 2005
- 1st Maxi Rolex Cup 2006
- 1st Maxi Rolex Cup 2009
- 1st X-35 World Championship 2008
- 1st X-35 European Championship 2009
- 1st X-35 European Championship 2010
- 1st X-35 Dutch Championship 2010
- 1st Orca World Championship 2008
- 1st Orca World Championship 2011
- 1st Orca World Championship 2012
- 2nd Orca European Championship 2012
- 1st Orca Italian Championship 2006 - 2008 - 2009
- 2nd Orca Italian Championship 2012
- 1st Sport Boats 2005 - 2007
- 1st Rolex Capri Sailing Week 2006 - 2007
- 1st Rolex Capri Sailing Week 2008 - 2009
- 1st X-41 Italian Championship 2011
- 2nd J-80 World Championship 2011
- 1st J-80 World Championship 2012
-
- 1st Irc 2 Rolex Middle Sea Race 2014
- 1st Orc 3 Rolex Middle Sea Race 2014



Banks Sails Europe

www.bankssails.eu

CENTRAL LOFT

BARI - ITALY
tel +39 080 5313830
info@bankssails.eu

Italian points

- ANCONA**
ancona@bankssails.it
- LIGNANO**
northeast@bankssails.it
- GENOVA**
genova@bankssails.it
- LIVORNO**
toscana@bankssails.it
- ROMA**
roma@bankssails.it
- NAPOLI**
dariodesiderio@bankssails.it
- MARSALA**
banksmarsala@gmail.com
- MESSINA**
luigi.minissale@gmail.com

European Points

- GERMANY**
germany@bankssails.eu
- UK**
daryl@banks.co.uk
- FRANCE**
france@bankssails.eu
- SPAIN**
spain@bankssails.eu
- GREECE**
greece@bankssails.eu
- MALTA**
info@sailpower.com.mt