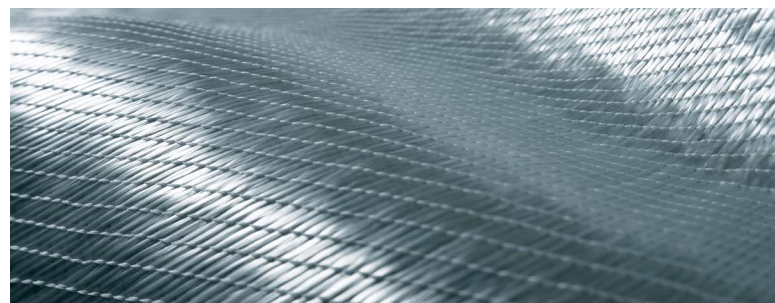




# COMPOSITE SOLUTIONS FOR MARINE APPLICATIONS



REINFORCING YOUR IDEAS

# REINFORCING YOUR IDEAS

## WITH GLASS AND CARBON



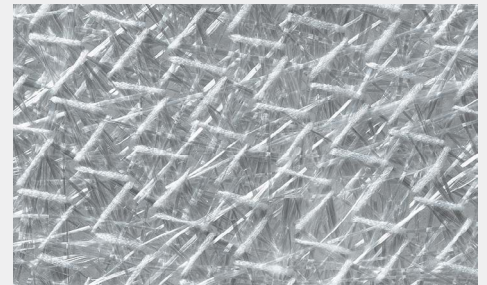
## THE RIGHT MATERIAL FOR EACH COMPONENT

**SAERTEX®** is the global market leader in the manufacture of multiaxial reinforcements, called non-crimp fabrics, and core materials for the production of fiber-reinforced composites.

In boatbuilding applications, SAERTEX products help to increase the performance of sailing yachts, motor boats and sightseeing vessels. By using our fiber-reinforced composite materials, steel and aluminum can be replaced to achieve significant weight reduction, energy savings, enhanced stiffness and corrosion resistance.

Our materials are used in the hull and deck planking, superstructures and interior moldings. For such applications, SAERTEX supplies complete material solutions for the sandwich construction system in the area of composites and delivers proven solutions for closed processes such as RTM.

Our **SAERcore®** special functional fabric with integrated flow enhancer is suitable for the rapid production of straightforward superstructures. When draping the fabric over vertical areas and large curved structures – for instance the hull – many of our customers favor the patented, self-adhesive **SAERfix®** fabric, which makes this work easier. In addition to multiaxial fabrics made of glass fibers, the patented structural core material **SAERfoam®** is an excellent replacement for balsa wood components and PVC/PET foams.

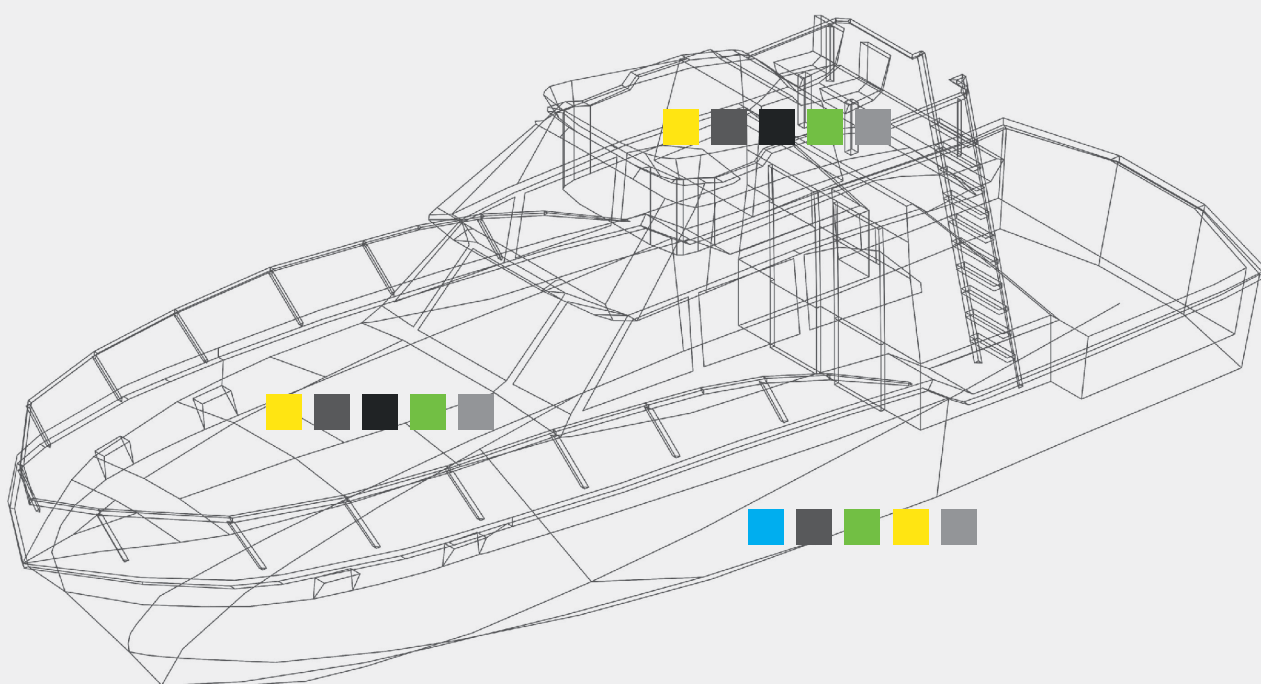


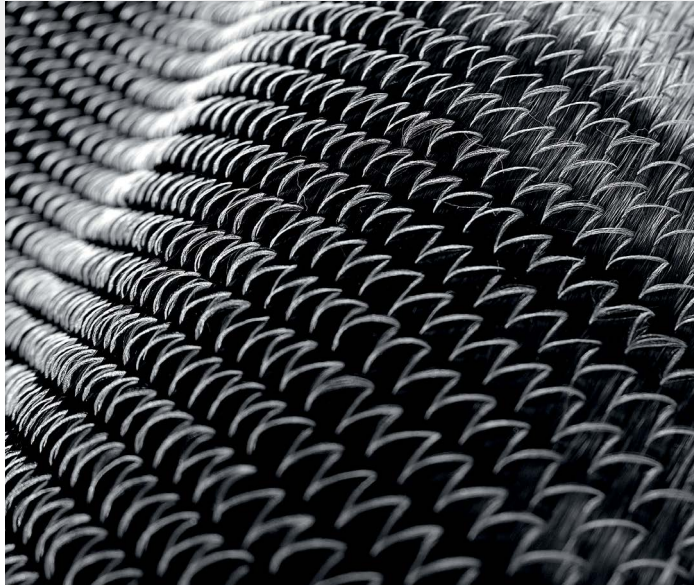
# PRODUCT SOLUTIONS

PROCESS	NCF	SAERfix®	SAERflow®	SAERfoam®	SAERcore® RC	Steady Plus UD
Infusion	X	X	X	X	X	X
RTM	X	X		X	X	X
HLU	X					X
MAIN BENEFIT						
Mechanical properties	X		X	X		X
Weight saving	X					X
Vertical lay-up		X		X		
Improves productivity		X	X	X	X	

## SOLUTIONS FOR SUPER-STRUCTURE, DECK, INTERIOR PARTS AND HULL:

■ NCF
 ■ SAERflow®
 ■ SAERcore® RC
 ■ SAERfix®
 ■ SAERfoam®
 ■ Steady Plus UD





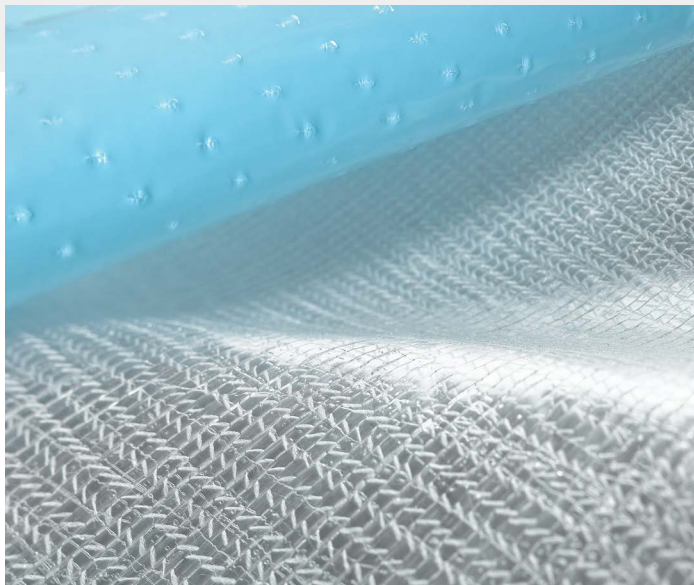
## MULTIAXIAL FABRICS

MADE OF GLASS, CARBON, AND ARAMID

Innovative and tailor-made: **SAERTEX®** composite reinforcements made of glass, carbon and aramid fibers, also known as Non-Crimp Fabrics (NCFs). Depending on the fiber type, surface weight and angle combination, various mechanical characteristics can be achieved. SAERTEX multiaxials are individually configured for our customers and optimally adapted to a range of processes. SAERTEX NCFs are compatible with various resin systems such as Polyester, Vinylester, Epoxy or Polyurethan.

Advantages of NCF compared to woven textiles:

- Stretched fibers for optimum mechanical strength and reduced weight at the same time
- Cost savings due to fewer layers
- Individual drapability and outstanding permeability
- CSM (Chopped Strand Mat) available to enhance thickness and reduce print-through



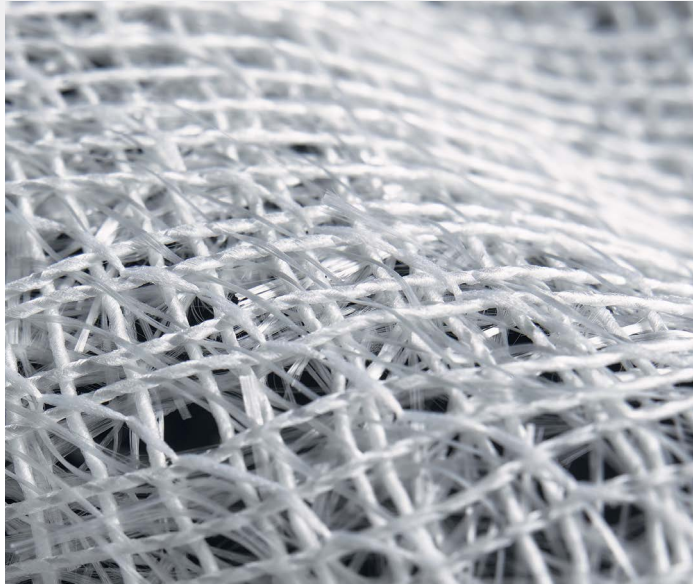
## SAERfix®

ADHESIVES

Spray adhesives have now become a thing of the past! Non-crimp fabrics containing **SAERfix®** are self-adhesive – the optimal solution for laying up and positioning multi-axial fabrics in the mold.

Advantages of SAERfix compared to spray adhesive:

- Automatic spread of adhesive affects the homogeneous surface, the result is better resin flow and better laminate quality
- Environmentally safe and harmless for workers cause no VOC during draping
- Time efficient: draping the fabric into the mold goes faster, No need to apply additional spray adhesive. Less time = less expense



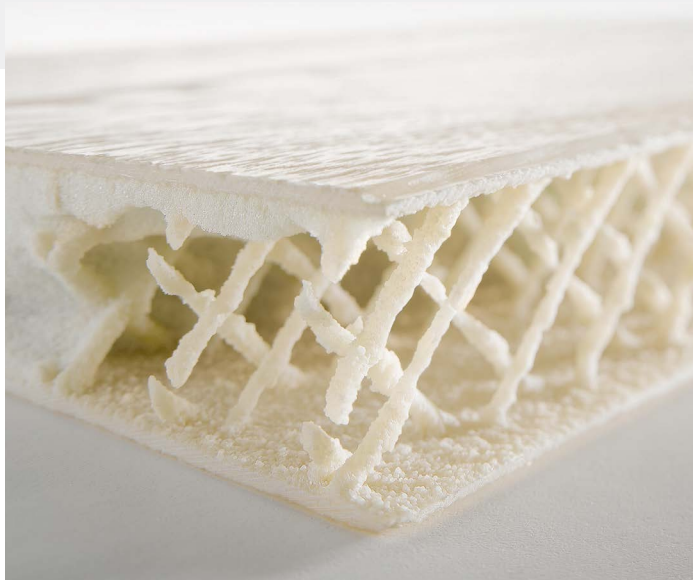
## SAERflow®

### STRUCTURAL FLOW MEDIA

**SAERflow®** is used as an internal flow media.

It combines a glass reinforcement and a lightweight synthetic structure. Together, they provide uncompressible layers with excellent resin flow and high draping properties. This product is ideal transition from HLU to infusion process.

- Excellent resin flow
- 1 layer = 1mm thick
- Saves time and money: No need for an external flow media and peel-ply, less resin consumption, saves up to 50% in handling costs
- Very good drapability: Because of its highly deformable properties, SAERflow can be easily draped while its original flow and mechanical properties are kept intact
- Typically only one layer required even in sandwich structures



## SAERfoam®

### STRUCTURAL CORE MATERIAL WITH 3D GLASS BRIDGES

**SAERfoam®** is a lightweight structural core material with 3D glass bridges. It replaces conventional core materials such as PVC, PET and balsa. Ultralight foam (PU/PE/PIR) is combined with 3D glass reinforcements and the mechanical properties can be individually optimised.

- Stronger than PET
- Cost efficient compared to PVC
- SAERfoam panels are more flexible before being impregnated with resin, they can pass large curved designs without drapable version → lower resin consumption and lower print through
- Closed cell core: For areas below the waterline, no water absorption into the core in case of failure of outer skin
- Very high shear modulus, which reduces deflection and allows thickness reduction
- Bureau Veritas certified



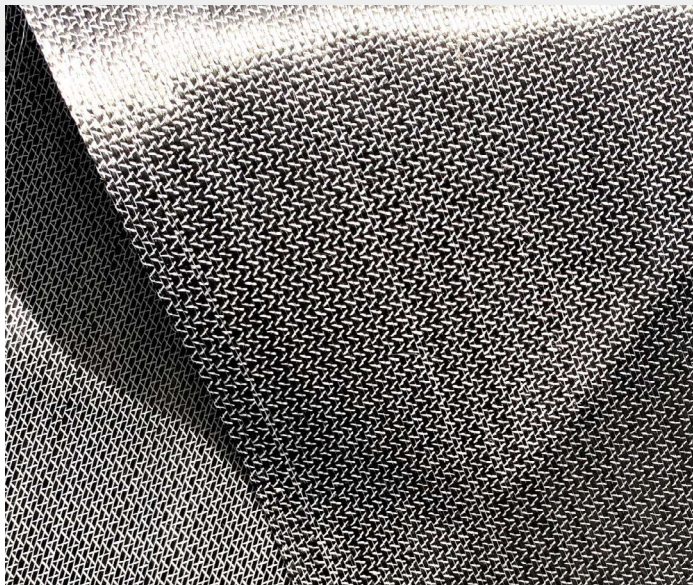
## SAERcore® RC

### CLOSED MOLD REINFORCEMENTS

Ideal when resin injection has to be done particularly quickly. **SAERcore®** consists of one or two layers of chopped strand mats (CSM) and an engineered flow media. Initially the resin flows horizontally into the core material and then impregnates the outer reinforcements through vertical injection.

The innovation of SAERcore RC: With its 100% Recycled Core material, it combines improved product properties with a clear step towards greater sustainability.

- Reduced CO<sub>2</sub> footprint thanks to 100% recycled core material
- Up to 50% faster resin flow for shorter injection and demolding cycle
- Excellent drapability and easier mold closing, even for complex geometries
- Compatible with **SAERfix®**, **SAERcore® MAX**, kits or surface veils for better finish quality



## STEADY PLUS UD

### FLOW-OPTIMIZED CARBON FABRIC

This unidirectional carbon NCF is one of our specially developed material solutions for applications with high laminate thicknesses.

The flow-optimized carbon fabric aims to avoid dry spots in the laminate and significantly improve component quality – with maximum compressive strength, potential savings in resin consumption and good drapability.

- Optimized for thick laminate structures up to 70 mm
- Fast resin infusion and uniform impregnation to avoid dry spots
- High fiber volume content (~60%) for excellent mechanical performance
- Outstanding evenness and wrinkle-free drapability

# TAKE ADVANTAGE OF **SAERTEX®** SERVICES



## **SAERTEX®** ENGINEERING SUPPORT

**SAERTEX®** provides comprehensive customer service from design through project completion. We also offer engineering support if necessary.



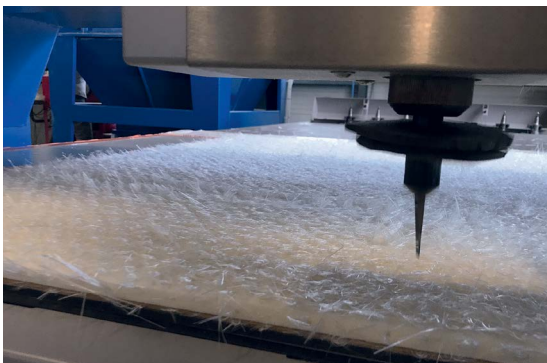
## MATERIAL SPECIFICATION

Our experts will support you in the choice of material and the development of the NCF. Depending on the fiber type, surface weight and angle combination, various mechanical characteristics can be achieved. The resulting composite material is, therefore, customized to meet your specifications.



## DNV-CERTIFIED TESTING LABORATORY

The **SAERTEX®** testing laboratory for non-metallic materials has been certified by DNV since 2013. Employees, facilities and procedures have been approved to internationally recognized standards for testing fiber-reinforced plastics.



## CUTTING & KITTING

**SAERTEX®** KITS provide custom-cut reinforcements, ready for immediate use in your production. Based on CAD data, all parts are precisely cut, efficiently nested and packed in the correct lay-up sequence. This approach minimizes waste, shortens lay-up time and reduces labor costs for a more efficient manufacturing process.

# SAERTEX® CASE STUDIES



Shipbuilder Brødrene Aa, whose shipyard is located in Hyen on the west coast of Norway, has relied on lightweight construction materials and composite solutions since the 1970s.

With the first sightseeing ship “Vision of the Fjords” in the Seasight design series, our customer Brødrene Aa marked a milestone in sustainable shipbuilding, where **SAERTEX®** carbon fabrics and a modern hybrid drive immensely reduced noise and exhaust emissions.



In 2018, the boat builder continued the success story with another ship of the same type. After many years of successful cooperation, Brødrene Aa continues to use SAERTEX carbon fiber fabrics for both sightseeing ships and even goes one step further in terms of propulsion: The “Future of the Fjords” is the world’s first all-electric carbon catamaran.



Another ground breaking step within zero emission passenger transport is the “Rygerelektra”, which is in operation since April 2020. The carbon fiber catamaran is equipped with an all-electric energy storage and propulsion system.

With the “Legacy of the Fjords”, another electrically powered carbon catamaran will enable tourists from all over the world to experience nature in a sustainable way through the Oslofjord from 2020.

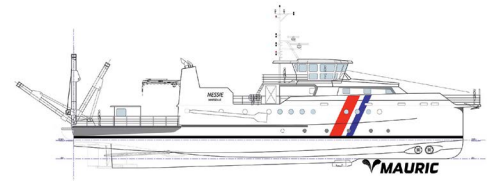
By replacing steel and aluminum component parts with carbon fiber, Brødrene Aa achieved quieter operation and lower exhaust emissions. These component parts were based on carbon non-crimp fabrics made by SAERTEX. Their fiber orientation and number of layers were adapted to the specific projects, depending on component requirements.



Watch the video of “Vision of the Fjords”  
on our our Homepage.

## ADHESIVE SOLUTION FOR THE IXBLUE NESSIE

As one of the few shipyards worldwide mastering large-scale composite infusion, iXblue builds efficient, economical, and eco-friendly workboats, vessels, and drones. The DRASSM (Department Research Archeologic Subaquatic and Submarine) is already using 14 meters and 36 meters iXblue composite vessels made of **SAERTEX®** non-crimp fabrics. In 2015, they started working in partnership with iXblue and the architect MAURIC on a bigger vessel to reinforce its fleet. The project named NESSIE, will be an innovative, multifunctional scientific vessel measuring 46 meters by over 10 meters, set to become the world's largest composite workboat.



On this project, the iXblue engineers and the SAERTEX team tested and studied the potential use of **SAERfix®**. Glue sprays have been used for years to place fabrics into molds, especially on vertical areas. This process takes significant time and work and ultimately results in higher processing costs. Using SAERfix, it became immediately clear that self-adhesive glass fabrics could completely eliminate the glue spraying process. The final results speak for themselves: time and cost savings of about 10%, perfect fiber wet out during infusion, and, consequently, a higher laminate quality.



## HACO SHIPYARD'S NEW BALI CATSPACE CATAMARAN

HACO Shipyard is located in Tunisia and is part of the French company CATANA Group, the world's third-largest manufacturer of catamarans. **SAERTEX®** partnered with HACO to develop a new catamaran with an entire deck produced in RTM method. The major challenge was to produce one full catamaran every two days. SAERTEX specialists had to find a way to produce an entire 12 meters x 6 meters deck in one piece using the RTM process, which would save an extensive amount of time.

A full technical evaluation was carried out to find the best solution. We chose **SAERcore®** MAX because of its resin flow speed. In combination with **SAERfix®**, the mold filling time was also drastically reduced and **SAERfoam®** was chosen because it is much stronger than PVC. In addition, SAERTEX developed a project-specific SAERcore MAX and SAERfoam kits to substantially reduce the amount of time HACO Shipyard spent for cutting and draping.



For more Informations about the  
"Bali Catspace Catamaran" visit our Homepage.

# GET IN CONTACT WITH US



**1. SAERTEX Germany**  
Saerbeck | Headquarter

**2. SAERTEX France**

**3. SAERTEX Portugal**

**4. SAERTEX Turkey**

**5. SAERTEX Baltics**

**6. SAERTEX South Africa**

**7. SAERTEX India**

**8. SAERTEX Brazil**

**9. SAERTEX Mexico**

**10. SAERTEX USA**

**11. SAERTEX China** – coming soon

## GLOBAL AVAILABILITY

Being close to our customers is important to us. We want to be right there – on-site – for our partners when they need us. That's why we have a global engineering and production presence and also offer a service network in more than 50 countries around the world.

