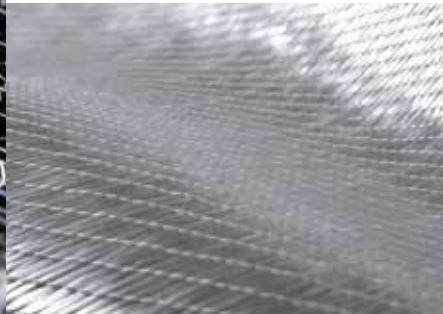




COMPOSITE SOLUTIONS FOR MARINE APPLICATIONS





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.

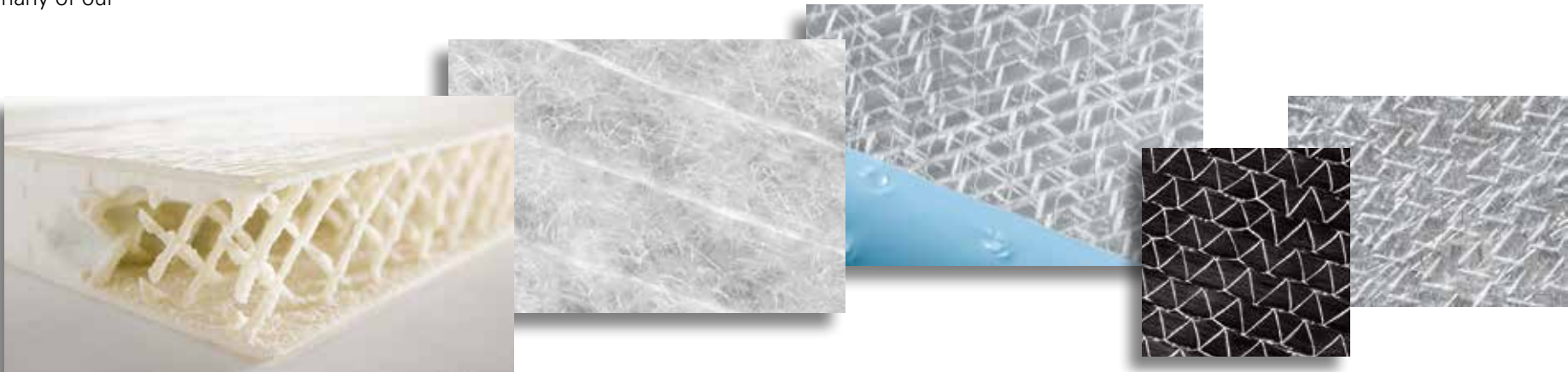
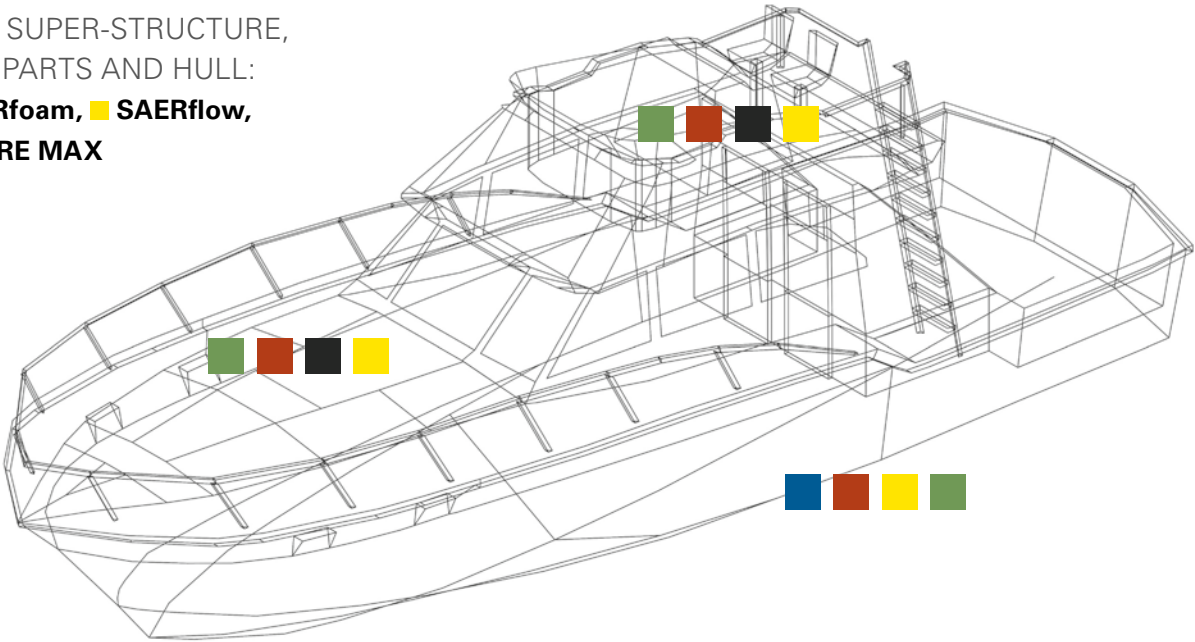
Our **SAERcore®** special functional fabric with integrated flow enhancer is suitable for the rapid production of straightforward superstructures. When draping the fabric over vertical areas and large curved structures – for instance the hull – many of our customers favor the patented, self-adhesive **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

		NCF	SAERfix®	SAERflow®	SAERfoam®	SAERcore® (MAX)	KITS
PROCESS	INFUSION	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					
	VERTICAL LAY-UP		X		X		X
	IMPROVES PRODUCTIVITY		X	X	X	X	X

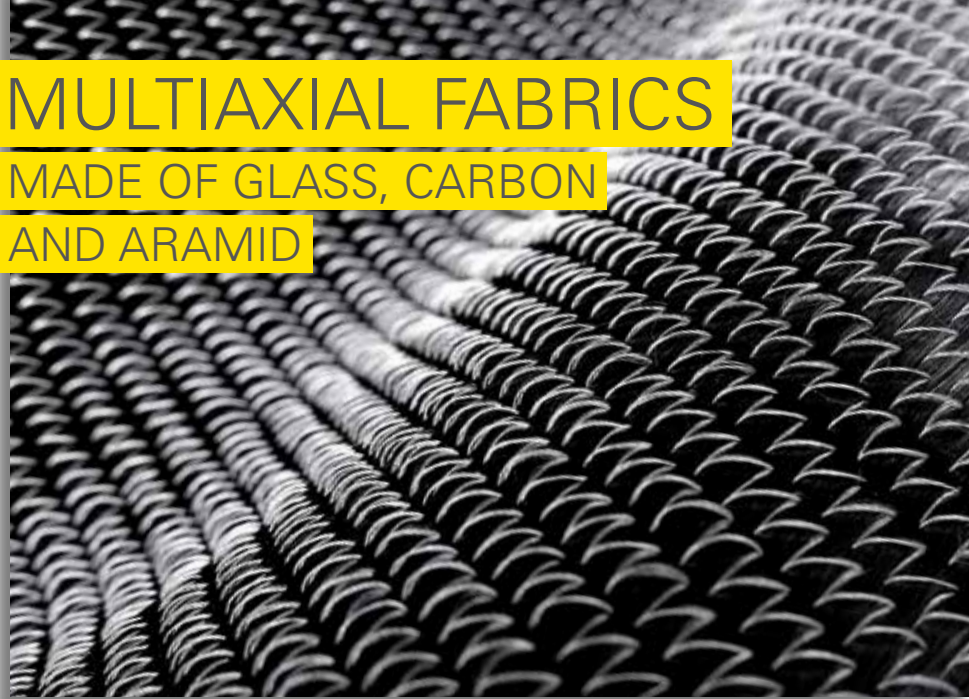
SOLUTIONS FOR SUPER-STRUCTURE, DECK, INTERIOR PARTS AND HULL:

■ SAERfix, ■ SAERfoam, ■ SAERflow, ■ NCF, ■ SAERcore MAX



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® EP/UP ADHESIVES



The adhesives in the **SAERfix®** product group simply make the positioning of non-crimp fabrics easier. NCFs finished with SAERfix® EP or SAERfix® UP are **self-adhesive**, eliminating the use of additional spray adhesives is a thing of the past when laying-up technical textiles in the mold. It is compatible with various resin types for maximum mechanical properties.

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
- **Time efficient**: draping the fabric into the mold goes faster, No need to apply additional spray adhesive. Less time = less expense
- Environmentally **safe and harmless** for workers cause no VOC during draping

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.



GL-CERTIFIED TESTING LABORATORY

The **SAERTEX®** testing laboratory for non-metallic materials has been certified by Germanischer Lloyd (GL) since 2013. Employees, facilities and procedures have been approved to GL standards for testing fiber-reinforced plastics.



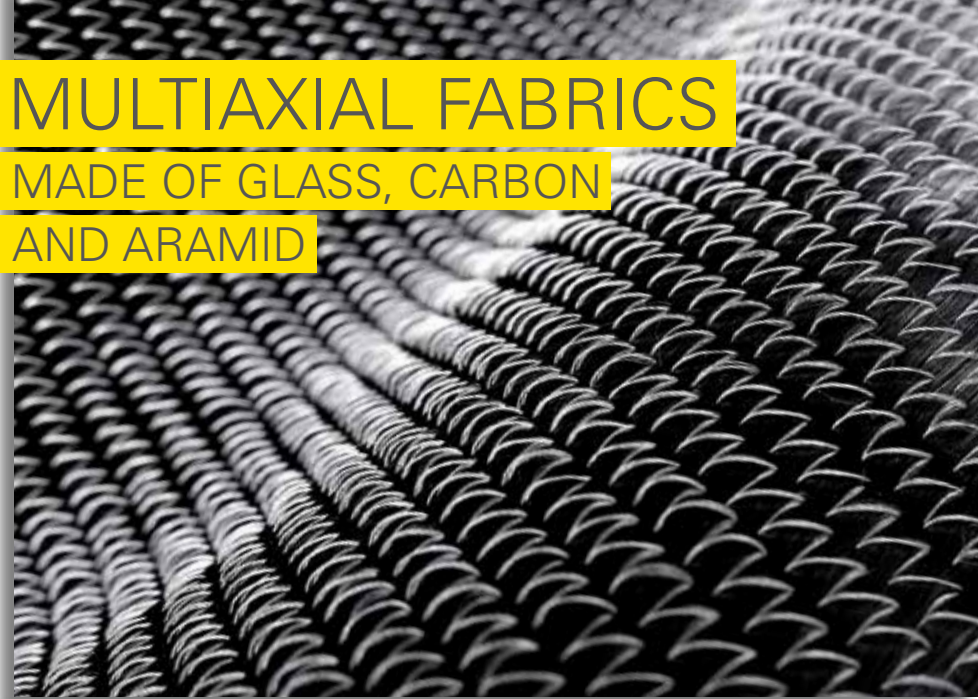
INDIVIDUAL CUT-TO-MEASURE, NESTING SERVICE AND PACKAGING CONCEPTS

Using CAD drawings and your specifications, we can precisely pre-cut required shapes using our cutting machine, making them ready for the next step in your manufacturing process. We will pack the cut pieces in the most efficient way that will improve your productivity. Your workshop is fully dedicated to composite parts production.



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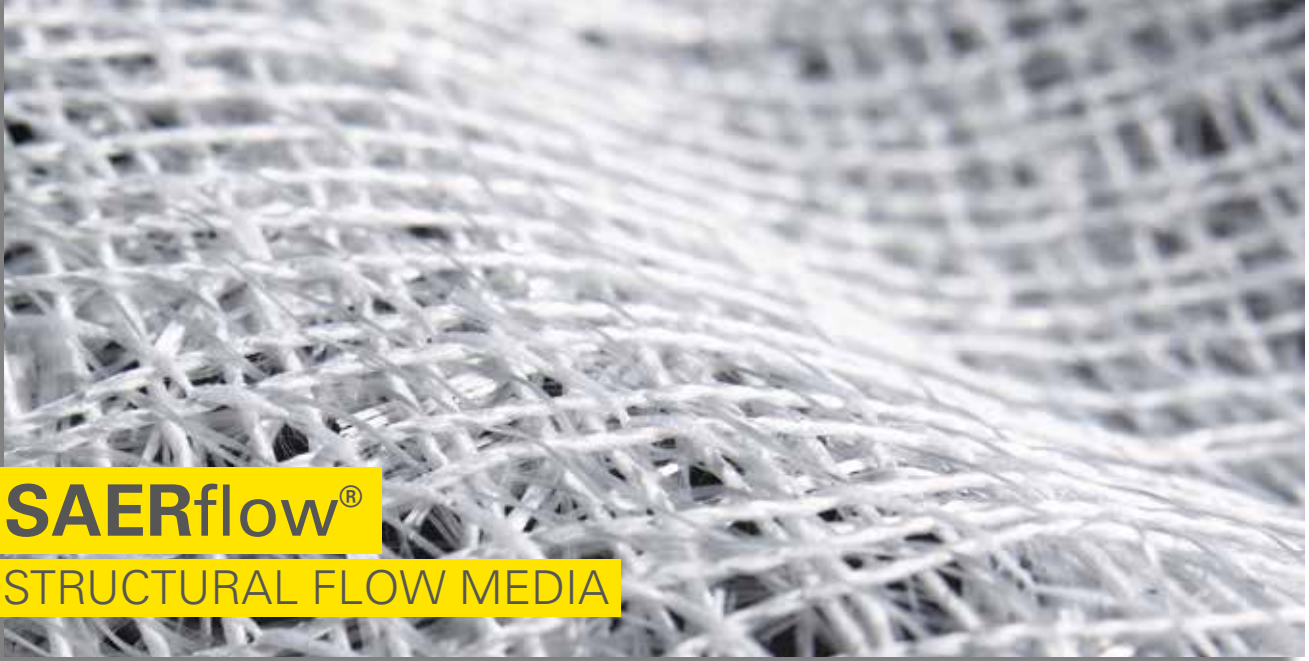


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SAERflow® STRUCTURAL FLOW MEDIA



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
- 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.
- 1 layer = 1mm thick

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
- Lighter than balsa
- 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® MAX CLOSED MOULD REINFORCEMENTS



SAERcore® is the ideal solution when resin injection has to be done particularly quickly. This product consists of one or two layers of chopped strand mat (CSM) and a core of PP (resin flow zone). Initially the resin flows horizontally into the core material and then impregnates the outer reinforcements through vertical injection, which saves a significant amount of time.

- CSM for good surface quality and to avoid print through, good resin flow due to PP core and good mechanical properties due to the NCF
- All in one: **Huge time** saving, (labor and cycle time) because only one layer per mold to drape
- Every component of the complex can be individually adapted, depending on the customer's requirements
- Possible to add surface veil for better finish

SAERTEX KITS FABRICS AND CORE PRE-CUT PARTS



SAERTEX KITS deliver ready-to-use, custom-cut solutions. A KIT consists of **pre-cut parts** based on the customer's requirements. All products from the **SAERTEX®** product range can be delivered as KITS.

After being cut to specification, the parts are put in a box in the required lay-up sequence.

- **Reduced lay-up time** thanks to packaging concept
- Nesting service to **minimize waste**
- Reduced labor costs thanks to cutting service
- **Consistently high quality** due to precisely fitted cuts based on CAD drawings

SAERTEX CASE STUDIES



SEASIGHT SERIES CARBON FIBER VESSELS



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 set a milestone for environmentally friendly ship operations. The lightweight construction with **SAERTEX®** carbon fabrics and a modern hybrid drive made it possible to reduce noise and exhaust emissions immensely.



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.

Brødrene Aa consistently used lightweight construction methods to achieve its objectives to reduce noise and exhaust emissions. Component parts made of carbon were used to replace structural components which were previously made of steel and aluminum. 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

iXblue Shipyard is one of the few shipyards in the world to master the infusion of large dimension composite parts. They develop and build 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 is named NESSIE, and it will be a scientific boat, innovative and multi functional. At 46 meters long and more than 10 meters wide, NESSIE will become the biggest working boat ever produced in the world with composites material.



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

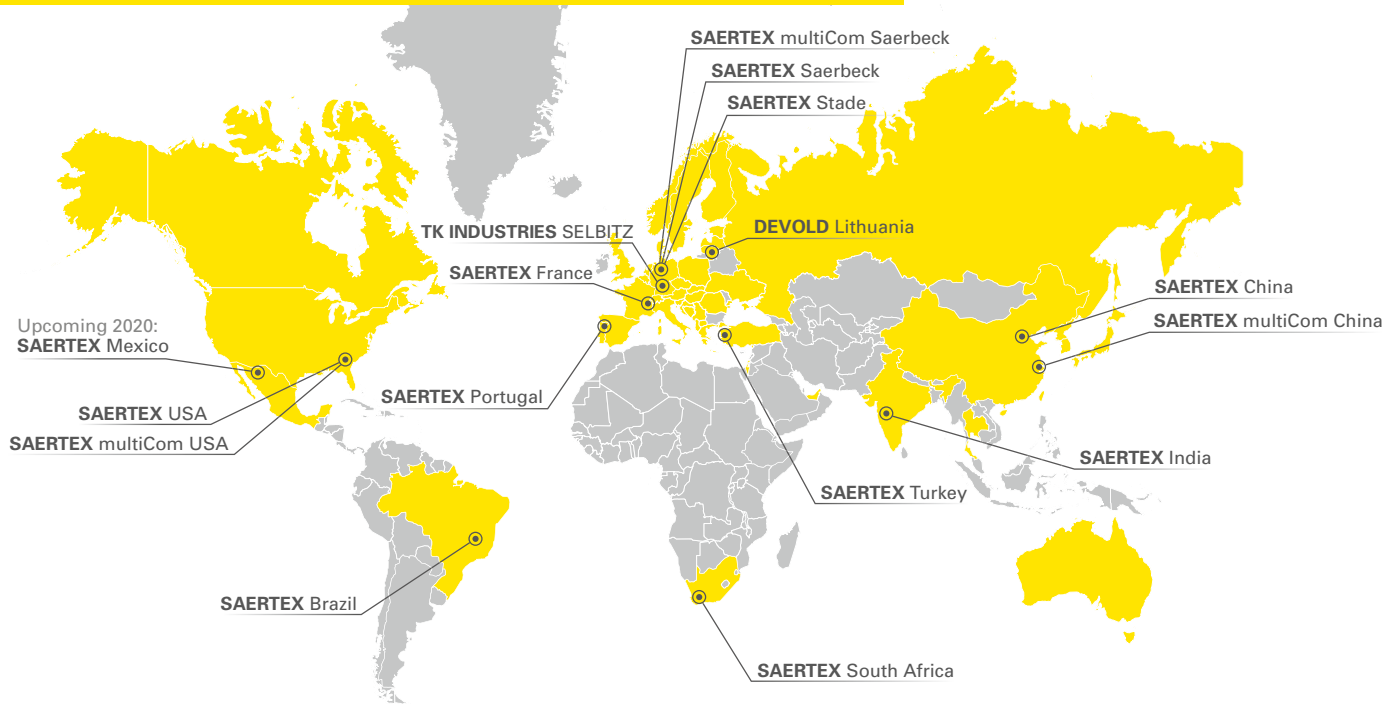


HACO Shipyard is located in Tunisia and is part of the French company **CATANA Group**, the world’s third-largest manufacturer of catamarans. **SAERTEX®** partnered with HACO to develop a new catamaran with an **entire deck produced in RTM method**. The major challenge was to produce one full catamaran 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 Cat-
space Catamaran”
visit our Homepage.

GET IN CONTACT WITH US



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 are represented by 15 production sites in 10 countries on 5 continents with engineering and production facilities and also offer a service network in more than 50 countries around the world.

CONSERVING RESOURCES WITH AND AT **SAERTEX**

One of the key success factors in sustainable engineering is achieving minimizing weight while simultaneously maximizing component quality. Both are possible using lightweight construction methods facilitated by **SAERTEX®** products. Conventional materials such as steel, aluminium, concrete and wood are being replaced by our cutting-edge composite materials made of glass, carbon and aramid fibers, which results in a significant reduction in the consumption of fossil fuels. Environmental impact is thereby reduced through the consequential reduction in emissions.

"Innovation for a resource-saving future" is the **SAERTEX®** vision. Sustainable business management is the cornerstone of long-term economic success and our products contribute significantly to this. As a company we are also continuously working on the sustainable optimization of our processes and products.

