

# shape

Gurit

The Gurit Magazine N° 15  
August 2014



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**Imprint** Gurit Holding AG, Group Communications

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**Pictures courtesy of** Ferrari (Cover, 8, 9), GTCat (4, 5, 6), Armorcast Products/NV Energy (7), Hodgdon Yachts (10, 11), AX Sport/Produx (12, 13), Danish Yachts (16, 17, 18, 19), KestutisAnuzis.com (20), AM Structures (21) Richard Sprang (24, 25), Martina Orsini (28), Rod Thomas Photography (30), Assegai Marine (31), All other pictures: Gurit Archives

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## Dear Reader

Gurit has seen a remarkable increase in demand. In fact, sales in the first half of 2014 increased by 28.8% to CHF 167 million, and we achieved the strongest quarterly sales volume from May to June 2014 since the third quarter of 2012. Gurit grew both in its Composite Materials (+18.1%) as well as in its Composite Systems and Engineering activities (+85.5%).

The global wind energy market recovers from its 18-month long trough. While the inherent volatility will continue to earmark this important business for Gurit, we expect wind energy to grow further in the years to come. To add more stability to our sales pattern and create new growth opportunities, Gurit continues to develop additional composite applications and markets: This edition of SHAPE again features such accomplishments, including our materials and components for the automotive and bus industry, newly developed ballistic protection prepreg materials and clever general industry applications of our lightweight composite materials. The visual and non-visual carbon fibre automotive prepreps featured in the last edition of SHAPE have met with sound market interest and are now being sampled at several sales leads.

While we are progressing on our business trajectory, existing and new skills and talents need to be built and reinforced. Ensuring that skills develop in line with the fundamental market needs and strategies will continue to be a major focus at Gurit going forward.

The current issue of SHAPE thus also talks about important strategic steps undertaken to widen our customer base and propel the use of high performance composites. All these initiatives are true to our vision of «Delivering the future of composite solutions» and to our mission of turning traditionally heavy and complex structures into cleverly engineered and lightweight constructions. Gurit offers a great deal of experience and skill in structural engineering, a complete range of materials, and – where requested – we can also support customers with finished components, such as moulds or bus and automotive exterior panels.

Last but not least, Gurit also expands its presence apart from the application realm into new geographic areas: Gurit (Hungary) Kft has successfully started to manufacture bus components and will, in the future, also take on the production of passenger car parts.

As you can see, the Gurit story continues to be interesting, and we are committed to strengthening the company further.

Yours sincerely,  
Rudolf Hadorn CEO

A handwritten signature in black ink, appearing to read 'Rud. Hadorn', with a stylized flourish extending from the bottom.

A white catamaran is shown from a side-on perspective, sailing on a deep blue sea with white-capped waves. The boat's two hulls are visible, and its large white sails are partially deployed. The background is a clear, bright sky. The text 'A new breed of luxury sailing cats' is overlaid in white on the lower half of the image.

# A new breed of luxury sailing cats



GTCat 66 is the first offspring of a new breed of racing cats. It draws from a superb genetic pool, including the inspired visions of Abdulla Al Hamli and Sylvain Vieujo, the know-how of multihull designers Nigel Irens and Benoit Cabaret, the signature handwriting of industrial designer Christophe Chedal Anglay, the accuracy of the Abu Dhabi MAR Shipyard, and the lightness of Gurit composites.

GTCat 66 is the product of eight years of desire, vision and hard work. Abdulla Al Hamli, an Emirati businessman, and Dubai-based French entrepreneur and former Olympic Tornado sailor Sylvain Vieujo were passionately committed to conceive the world's fastest

luxury sailing cat. GTCat 66 was fully built at Abu Dhabi MAR and launched in Dubai this Spring. «Binkumadi» has rapidly become a hot topic amongst the global catamaran community.

Two of the world's leading multihull designers, Nigel Irens and Benoit Cabaret, and industrial designer Christophe Chedal Anglay created this stunning 20 m racing cat, which was almost entirely built in lightweight infused carbon fibre sandwich structure.

#### Using carbon throughout the boat

Rudy Jurg, Gurit Regional Sales Manager Middle East, Africa & Benelux, explained: «We can already look back on a long history with the Abu Dhabi MAR team. So we were, of course, excited to learn that this groundbreaking project was going to be built using Gurit composite materials. Apart from PRIME™ 20LV infusion resin, we supplied Gurit® Corecell™ struc-



The dagger boards – lifted up here for mooring – are also built in carbon fibre.

tural foams in various densities and cuts, Ampreg 22 epoxy resins, and Spabond 340LV adhesives». Andrew Lea, Head of Advanced Programs for Abu Dhabi MAR added: «Using carbon throughout the boat was a prerequisite to achieve a lightweight, high-performance boat. We also knew that utmost accuracy was paramount to achieve the minimal weight requirements of this build. Being well familiar with high speed applications using Gurit materials, our experienced staff managed to achieve the full design intent». Andre Copsey, lead builder on the shop floor, added: «As a team, we just concentrated on making everything as light as possible. From our previous experience with Gurit, we knew that this could easily be achieved by using their products». GTCat is very pleased, too: «The result is a tamed racing yacht that is at once ultra-fast, luxurious and spacious. She has four cabins and a saloon area that puts a 30 m mono-

hull to shame. If pressed, she can fly her weather hull like a racing catamaran in 14 knots of breeze and can achieve speeds of 20 knots. Recently, when sailing in winds of over 20 knots and with two reefs in the main sail, she proves to be very light on the helm and extremely stable. The hulls sliced through the short steep chop found in the Gulf area with ease and with a real sense of security. All credit to the design and build structure», commented Scott Collier, project manager GTCat.

### Long and narrow hulls

Lightweight design and an optimised materials package are obviously key elements to achieve high speeds. Another part of the boat's top performance are her very slim, and considering her beam, very long hulls. They increase speed, comfort and safety on board. Having to push away relatively little water, the wave-piercing bows of Binkumadi easily separate the waters, while the chines running the length of the hulls help shed it, and at the same time, provide additional structural stiffness. The narrow beam also contributes to the boat's low displacement of just 11.5 tonnes, several tonnes less than other high performance cruising catamarans. Other eye-catching factors are the low freeboard, the lack of a solid aft deck and – a most prominent feature – the absence of a forward crossbeam. The forestay tacks to a bowsprit which extends forward from the mast with trampoline on either side. Several defining features of GTCat 66 stem from the sailing background that Al Hamli and Vieujot have in A-Class dinghy catamarans. As a result, the boat has a state of the art full carbon rotating wingmast rig and giant, curved, A-Class catamaran style foils – the leeward board providing increased lift the more the boat heels. The dagger boards also use built-in carbon and feature high density Gurit® Corecell™ in the underwater body and slamming areas. GTCat 66 has thus been dubbed an «A-Class cat with beds».

### For more information

[www.gtcat.com](http://www.gtcat.com)

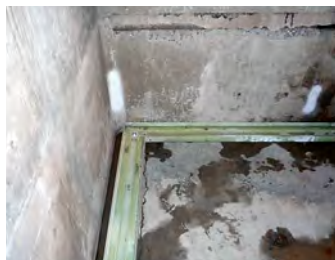
[bit.ly/GuritShape0](http://bit.ly/GuritShape0)

# Truly «boxing clever»

Voltek is a patented lightweight vault replacement system. Its structural panels are prefabricated using Gurit® Balsaflex™ core material. Fitted together inside an in-ground vault, they greatly extend the life span when the old concrete walls become crumbly and start to disintegrate.

## CORPORATE NEWS

When Gurit acquired its Balsaflex business in 2011, Balsaflex panels were mainly shipped to wind energy customers. Not only has that list greatly increased, but it now also contains a considerable number of non-wind energy clients, such as e.g. Armorcast. Establishing its own glued block factory in Ecuador, Gurit has made an important backward integration step. The expanded capacity is now already fully loaded – supplying Gurit® Balsaflex™ products to a growing range of customers.



After measuring the exact inside dimensions of the vault, all pieces are first assembled on a frame above ground. With all cutouts correctly positioned, the elements are then lowered into the vault where they are mounted onto a ground railing and bonded together.

Gurit's US West Coast sales office recently brought Armorcast Products into the fold as a new customer. Since 1966, Armorcast has been supplying the electrical utility industry with secure and protective in-ground enclosures, utility pads and vaults. One of Armorcast's recent product introductions, the Voltek Vault Replacement System, is a newly patented design for an in situ utility vault replacement system. Gurit® Balsaflex™ has been qualified as the primary structural core material which keep the prefabricated panels as light as possible, yet provide a great deal of structural strength and stiffness.

### A box inside the box

This system creates an inner structural envelope inside existing de-

caying underground vaults. This not only prolongs the life span of such structures, but also greatly reduces and avoids significant disruptions to traffic and utility supply. Rather than digging up a crumbling in-ground concrete vault and replacing it with a new one, prefabricated composite panels are lowered into an in-service vault and are fit together inside the existing structure, allowing the old vault to continue to disintegrate around the new structurally sound Voltek Vault Replacement System.

### Rapidly adopted by utilities

Pacific Gas & Electric, one of California's largest utility companies, has approved the use of these structures, as have many municipalities including NV Energy, the City of Anaheim, and the City of Burbank.

# LaFerrari – Ferrari's most ambitious project

LaFerrari boasts the most extreme performance ever achieved by a Ferrari production car and features the most advanced and innovative technical solutions which are to filter down to the rest of the Ferrari range. LaFerrari represents Ferrari's most ambitious project yet to push the boundaries of technology on a road car, drawing together the finest expression of the marque's technical capabilities in both GT and Formula 1 engineering.

LaFerrari was designed by the Ferrari Styling Centre which worked in synergy with the engineering and development departments from the very start of the model's inception. LaFerrari's overall silhouette and proportions are the very natural product of its architecture and the layout of its hybrid running gear. The design is striking and innovative, yet its sleek profile remains true to Ferrari's classic mid-rear longitudinal V12 sports car archetype: the cabin and engine compartment volumes are contained within the wheelbase to achieve the best possible balance of its masses.

## Excellent balance between front and rear overhangs

Impressively, despite the addition of a Kinetic Energy Recovery System (KERS), its batteries and numerous electronic components, the engineers have succeeded in ensuring that LaFerrari's dimensions are no larger than those of the Enzo. In fact, the engineering constraints involved in packaging the two powertrains have actually resulted in a better balance be-

tween the car's front and rear overhangs. Seen from the side, the car has a sharp, downward-sloping nose and a very low bonnet which emphasises its muscular wheelarches. The result is strongly reminiscent of the gloriously exuberant forms of late-1960s Ferrari sports prototypes, such as the 330 P4 and the 312P. The ratio of the front and wheelarch dimensions are also very much in line with Ferrari tradition.

The LaFerrari's body has been given a sculptural treatment heavily influenced by its aerodynamics. Its elegantly sculpted forms lend a sense of huge power and aggression to the wheelarches, with surfaces flowing fluidly rearwards over the cockpit and beautifully



resolved forms that give shape to the volumes themselves.

This fluid surface treatment provides both the exceptional drag and downforce characteristics required by the aerodynamicists, as well as very efficiently channeling air to the components requiring cooling. The car's front section incorporates a lower front wing that appears suspended on a single central strut beneath the nose, a clearly F1-inspired choice.

Nowhere is the car's extreme, sporty character more evident than in its tail section, where its muscular power is uncompromisingly revealed. Here, two deep grooves emerge from the interplay of surfaces over the imposing wheelarches. These efficiently channel hot air from the engine bay and, in doing so, contribute to boosting downforce at the rear of the car. The engine compartment ends in a full-width holder beneath which is concealed an unprecedented active aerodynamic device. Sitting on a central strut, which is

stylistically reminiscent of the front one and which also serves to shield the KERS, is a large adjustable spoiler which deploys automatically and does not impinge upon the sleek design of the tail. The lower section of the tail features bare carbon-fibre and is dominated by deep apertures and a generous diffuser equipped with movable flaps that adjust when the motorised spoiler is deployed.

#### High impact and penetration resistance

To attain the performance goals set for LaFerrari, Ferrari drew not only on the Scuderia's F1 experience in the choice of materials, design and engineering, but brought in the expertise of Rory Byrne, the legendary F1 designer who was responsible for no fewer than 11 of Ferrari's World Championship-winning cars. A working group of GT and F1 engineers designed a chassis which would provide maximum rigidity and minimum weight, despite the constraints imposed by incorporating the hybrid system. During the engineering phase, a number

of functions were integrated within the chassis design to reduce weight. One example is the seat structure which is part of the chassis, lowering weight and ensuring a more compact architecture and a lower centre of gravity.

These uncompromising solutions guaranteed a significant improvement in performance characteristics over the chassis of the Enzo Ferrari, with torsional rigidity increased by 27 percent and beam stiffness up by 22 percent, while weight has dropped by 20 percent. The chassis is built entirely in-house in Maranello alongside the F1 single-seaters using the Scuderia's materials and production processes.

Through close cooperation between Gurit and Ferrari, Gurit's Class-A CBS system was selected for the front and rear fenders of this prestigious vehicle. Using the most advanced directly heated metal tool technologies combined with CBS, highly functional Class-A components were developed, achieving panels with the quality and performance associated with Ferrari.





The scale of this racer is truly stunning.

# Creating a new record-breaker

Gurit's contributions to the grand prix sailing world have been long respected, with world-renowned yachts like Wild Oats, Mari-Cha IV, Morning Glory, and Puma's Mar Mostro all featuring Gurit engineering and products. Now, in a small Maine/USA town, what is designed to be the world's fastest monohull is taking shape – and she's being laid up with 100% Gurit products.

Jim Clark, co-founder of Netscape and owner of the yachts Hyperion, Athena, and Hanuman, has commissioned this 100-plus-foot maxi for the sole purpose of destroying previously held speed records. Clark and his skipper, America's Cup and Volvo Ocean Race sailor Ken Read, are taking aim at the

Transatlantic, Sydney-Hobart, and Newport-Bermuda records, to name but a few.

## Largest US single hull infusion mould

The construction team at Hodgdon Yachts in East Boothbay, led by internationally respected

builders Brandon Linton and Tim Hackett, accomplished another feat before the yacht itself was even started; the mould is the largest single hull mould ever built using infusion technology in the US and one of only a few of this scale created worldwide. Gurit® Balsaflex™ core material and T-Prime 160 epoxy tooling resin were used in the fabrication of the hull mould. T-Prime 160 has a long pot-life and gel-time, very low shrinkage, and can be cured at ambient temperatures. It is thus ideal for infusing large or complex moulds. When fully post-cured, T-Prime 160 is thermally stable to up to 160°C, highly resistant to thermal cycling.

Linton and Hackett are known for their leadership on construction of the Puma Volvo Ocean Race boats, which performed extremely well in their global passages. The two have significant



Hodgdon builders work on the companionway.



Bagged and ready for the cook.

experience with Gurit products and are relying on them exclusively for what could be their most famous project yet.

### Trust in tried and tested products

Hull and deck, as well as all the primary components including bulkheads, appendages, stringers, and the keel box, are built in carbon prepreg. A variety of weights of Gurit SE 84 epoxy resin prepreps are being used for the build of the hull and deck structures with IM fibres, as well as woven and double bias RC 200T, XC 302, and XC 411 carbon fibre materials. In addition, Gurit's SA 80 film adhesive is used for core bonding, and SP 4832 mono component is used for core splicing. The comprehensive Gurit materials package also includes Spabond 345 as the adhesive of choice for filleting of all the bulkheads and stringers, and

Spabond 340 which is used throughout the build for bonding of cured components. The secondary bonding applications used Gurit's wet systems Ampreg 26 and Spabond 345 adhesives.

«Our team has used Gurit products for years», says Tim Hacket. «It was the easy choice for this project as well, since we can use the materials and resin systems with confidence. We don't have to test them; we know their ins and outs and trust them for a build of this size and complexity.»

The design heritage of this record-breaker to be couldn't be more impressive: The French designers Marc Van Peteghem and Vincent Lauriot-Prévoist (VPLP), here in collaboration with Guillaume Verdier, have a record of designing offshore winners, including among them Banque Populaire V, Safran, MACIF, and Groupama 3. MACIF in particular was the start-

ing point for Clark's maxi design, which includes the wide, stable hull of an IMOCA 60.

### Manpowered winches to save fuel on long-distance voyages

A canting keel and water ballast will provide stability. Her sail plan will sit well aft of her counterparts, Wild Oats and Perpetual Loyal (formerly Speedboat), and notably, winches will be manually powered, unusual in a yacht of this size. The team determined that relying on manpower rather than a hydraulic solution would save significant amounts of fuel over long distances, key to maintaining the kind of speeds needed for this ambitious programme.

Scheduled for launch and trials in September, the boat will then be shipped to Australia to take on the fleet at the Sydney-Hobart race on Boxing Day.

# Build your own plane

Donald Williamson, CEO of the South African composite bicycle and race car component specialist Produx, has been a keen aerobatic aviator for the past 35 years. «I have always wanted to build my own plane, but I only got around to turning this dream into reality in 2009. With the third improved AX Sport aircraft now ready to fly, we are also ready to start kit production for our affordable, lightweight, fully carbon composite AX Sport aircraft».

Building one's own lightweight carbon sports aircraft has never been easier: South African composite specialist Produx is to start composite component production for AX Sport – a fully carbon composite aerobatic aircraft. «All the main and more complex structural parts will be built and assembled at Produx. The customer thus receives a partly assembled aircraft that can be quickly completed with only minor structural composite work», Donald Williamson, CEO of Produx explains.

Not even two years after the decision to build his own plane, Donald took off for the first time in the prototype AX Sport in February 2011. The version has already exceeded 150 flight hours. Many aerobatic flight tests were conducted with a Lycoming IO-235 118hp engine with great success. «The engine has since been replaced by the more powerful

Lycoming IO-320 150hp, which then moves the aircraft into the Experimental category. The owner gets to specify the avionics and the ballistic parachute. In case of an emergency, the canopy of such a parachute is ejected by a small rocket motor and opens very quickly to bring passenger, pilot, and aircraft safely down. As a last step, the owners will have the joy of painting their own craft.



## The quest for the ideal aerobatics plane

Donald has already had the pleasure of building, flying and improving the first two versions of his AX Sport plane. As a passionate aerobatic pilot, he sought to make AX Sport as suitable as possible for aerobatics while keeping within a reasonable budget. Its design is quite similar to most high-performance aerobatic crafts which, according to Donald, are just too expensive. Andrew Parsons of

AMT Composites, Gurit's materials distributor in South Africa, adds, «I have known Donald for some time as a customer. His dream of building his own plane and the perseverance and dedication he put into this project has turned us into friends. As an aeronautical engineer by profession, I have offered to look at his drawings. So, I ultimately became responsible for the aerodynamics and the structural design of the aircraft, while Donald was in charge of the detail design and building the actual aircraft».

### Evolution leads to fully carbon composite build

The design process included 14 iterations, numerous weight and balance estimates, and detailed load calculations. The prototype aircraft sported carbon fibre wings, rudder, elevator, vertical and horizontal stabilisers, attached to a chromoly steel tube fuselage clad with lightweight sandwich panels. Chromoly is not as lightweight as some other steel alloys, and certainly not as composites, but has the advantages of high tensile strength and malleability, thus an ideal material for the prototype. «The chromoly tube fuselage was



AX Sports are quite easy to assemble.

easy to modify as all the various parts came together. Once structurally and later flight tested, the carbon composite fuselage design was then optimised and finalised», summarises Donald about the evolution of the build.

AX Sport was designed to meet the Light Sport Aircraft (LSA) regulations. A structural test wing was loaded to the equivalent of 12G at 600 kg with civil aviation inspectors present, with the load being held for 2 minutes. The same wing was later tested to even 16 G at 600kg and demonstrated a wing tip deflection of only 100 mm and no permanent deflection. The horizontal and vertical tail, the ailerons, elevators, and the fuselage were also tested to 16G at 600 kg without any failures.

The small two-seater taildragger features low wings and a large acrylic canopy for maximum visibility. The plane is now almost entirely vacuum infused using carbon fibre, core and epoxy resin. «This choice of materials allowed us to reduce weight and – as important-

ly – increase performance and fun in the air. I am sure any AX Sport pilot will call the control stick a joystick», Donald smiled.

The plane is almost fully infused or wet laminated with Gurit's PRIME 20 epoxy resin system. Apart from high strength carbon fibre, the build is based on Gurit® CoreCell™ M structural foam in various thicknesses and styles and Gurit's S-Fair 600 epoxy filler. All secondary bonds are made with Spabond 340LV. So far, all components are female moulded in Teflon-lined forms. «Again, we used a lot of Gurit's T-Paste 70 to build our own tools from XPS foam plugs», Donald specified, who also uses Gurit prepreps for his Produx bicycles. «Currently, we are looking at using Gurit's SparPreg™ materials for all of the spar caps. This may lead us to using prepreps as well». So, AX Sports will continue to evolve.

### For more information

- 🔗 [www.axsport.co.za](http://www.axsport.co.za)
- 🔗 [bit.ly/GuritShape1](https://bit.ly/GuritShape1)
- 🔗 [bit.ly/GuritShape2](https://bit.ly/GuritShape2)





# Bullet-proof PF700 prepreg

Composites are very versatile materials and offer advantages in many different ways. Gurit's strategy is to investigate such new application areas and to create bespoke materials for newly identified applications. One such example is ballistic protection: Laminates provide effective ballistic protection at a much lower weight than metallic armour materials. Gurit has developed and qualified a new bullet-proof prepreg which is now being introduced to the market.

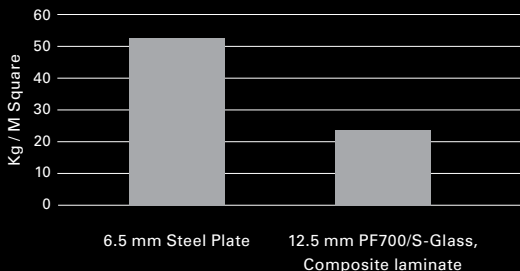
Composite armour works by absorbing the kinetic energy of the projectile as it passes through the laminate. There are three distinct stages involved in the stopping of a projectile: firstly, the blunting or deformation of the projectile, secondly, the slowing phase and, thirdly, the catching of the projectile. A composite laminate is made up of multiple layers of reinforcement fibres and resin. These layers are engineered to

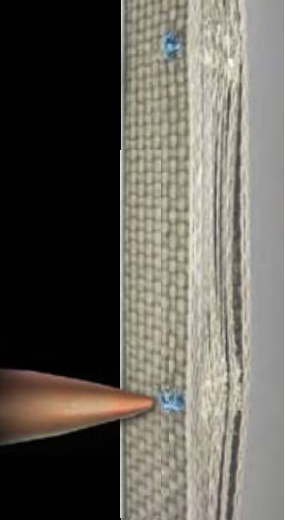
de-laminate at the impact of a projectile. This effect greatly enhances the slowing and stopping of the projectile over other materials.

## Half the weight for equivalent protection

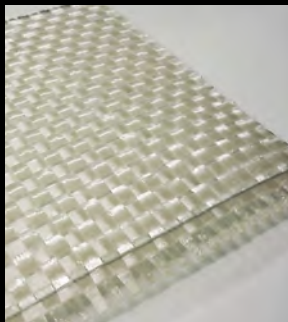
The biggest advantage of composite armour over steel is the significantly lower weight. It can be up to 50% lighter, while providing equivalent protection against projectiles. Projectiles do not need to be bullets. In fact, artillery or mortar shells, aerial bombs,

Weight of Composite Panel stopping  
a 7.62 mm (0.3 Calibre)  
Fragment Simulation Projectile (FSP) at 750  
m/s

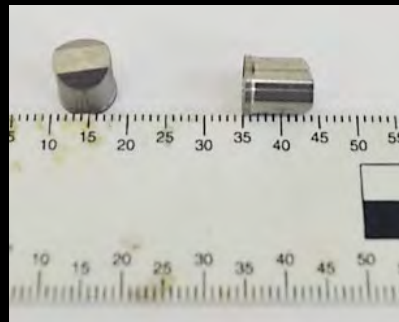




40-ply laminate of  
PF700 - S2 Glass-  
830g/msq-18% resin  
content prepreg -  
Stopping a 7.62 x 51  
mm NATO rifle  
round (M80 Ball).



PF700 - S2  
Glass-830g/msq-  
18% resin content  
prepreg.



0.3 Calibre, 7.62 mm FSP  
(Fragment Simulation  
Projectiles) - Designed to  
simulate metal fragment  
projectiles.

grenades, and antipersonnel mines are all fragmentation devices whose steel casings burst into small fragments when their explosive cores go off.

#### Finding the best solution for different uses

The most common form of anti-ballistic composites is made from a combination of glass reinforcement and phenolic resin. The ballistic protection properties can be enhanced by altering the fibre and resin type: Stronger fibres like S2 glass increase the ballistic protection of a laminate over E-Glass by 10–20%. Similarly, stronger epoxy resin can increase the anti-ballistic performance over phenolic resin. Yet, epoxy is less desirable due to its lower fire resistance.

As engineered materials, composites are designed to meet specific requirements including threat levels, weight requirements and cost restrictions. Typically, solid composite armour is made from phenolic resin and reinforcement fibres showing a resin content in the region of 18–20%. Personal armour does not need to be structurally strong, so the composite plates used here are made with even lower resin content laminates (<12% by weight). Ceramic composites offer a greater level of hardness which

can deflect or blunt the projectile before stopping it by under-lining composite or steel, again this application uses a different form of composite material.

#### Gurit PF700 tried and tested

Composite armour is used in the production of military vehicles, land-based shelters, ships and aircraft. It can be used as a structural material or as secondary plate armour just for protection. The need to reduce the weight of armoured vehicles has led to a large volume of composites being used in this area. Gurit's PF700 has been developed with this in mind. It meets the FST requirements and conforms to the threat levels required for this market. It is also suitable for production of flat panels in a press moulding process or for moulding more complex parts by autoclaves.

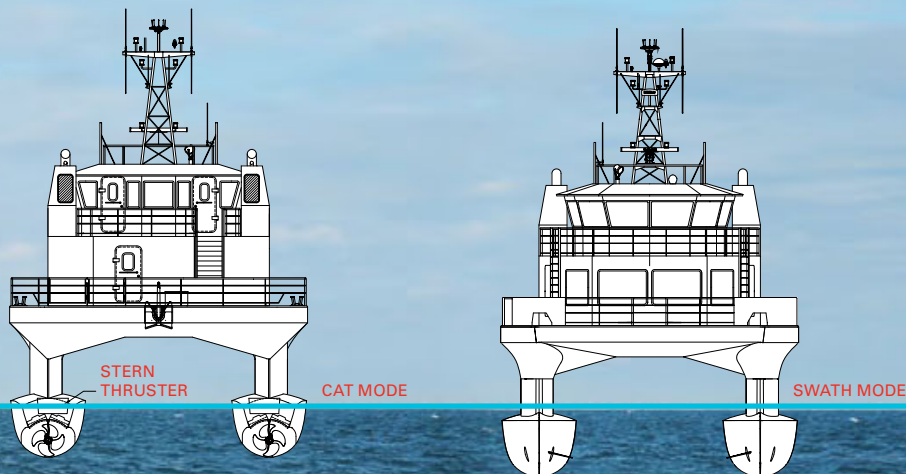
Gurit's PF700 Ballistic Protection resin has been developed internally with input from industry leads specializing in defence applications. The PF700 prepreg has also successfully been tested by Cranfield University, Impact and Armour Group. It conforms to the requirements of the US Military specification MIL-DTL-64154B.



# First-class stride across the waves

The wind is howling, the sea is rough – and an offshore wind turbine needs urgent servicing. Every minute of downtime means losing money for a wind farm. Safe and comfortable high-speed transport to offshore wind parks and maximum stability when close to a turbine are what the Small Waterplane Area Twin Hull (SWATH) vessels of Danish Yachts were conceived, engineered and built for. When raised to catamaran mode, a SWATH seems to be striding fast across the gentle waves. In rough seas or when approaching a wind turbine tower, the vessel uses its ballast capacity to submerge the pontoon section of its finned hull in less than 45 seconds.

Thanks to its advanced composite construction and hard chine hull design, the vessel is able to achieve much higher speeds in catamaran mode than traditionally built displacement SWATHs.



Operating in SWATH mode greatly reduces the vessel's movement and adds comfort and safety when sailing. Together with the 10.6m beam and 25m of length of the twin hull configuration, this mode also enables service personnel to safely embark or disembark the turbines' landing platforms in rough seas with significant wave heights of up to 2.5 m.

### All-carbon composite SWATHs...

The series-produced Danish Yachts' SWATHs offer a new approach to special purpose, semi-submersible offshore crew transport and service vessels: They are the first all-carbon composite, lightweight SWATHs in the world, allowing them to take even better advantage of the SWATH concept than conventionally built vessels. The superstructure can be configured in many different ways to suit a number of industries, including offshore wind energy, but also offshore oil and gas. Hull and superstructure, as well as internal structure and reinforcements, are all built using a strong yet lightweight epoxy infused carbon and core

sandwich concept. This maximises fuel efficiency and passengers and cargo capacity, while providing the durability and low maintenance needed for trouble-free operation in rough conditions.

The Danish Yachts' SWATHs cover a range of some 1000 nautical miles and offer first-class seating, relaxing, and dining areas for its 24 passengers and 5 crew. This ensures that the service engineers arrive well-rested and without any symptoms of motion sickness at an offshore wind farm.

A customised, high-friction fender system, supported by precise manoeuvring capabilities with four side thrusters totaling 600 HP and two variable-pitch propellers aft, allows the vessels to stay safely connected against an offshore wind turbine tower.

### ...rely on full Gurit materials package

Gurit was in charge of the structural design of the Wheelhouse Structure of the first four SWATHs and supplied a full materials package for both the hull and the superstructure. It included PRIME™ 20LV, an

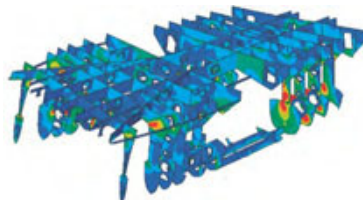


The main deck was infusion-built as one single, very detailed piece and then turned over.

epoxyinfusion system which is ideal for large structures such as boat hulls, decks and complex superstructures. Gurit also supplied pre-cut and pre-kitted pieces of Gurit®Corecell™ M structural foam in a large variety of formats, greatly assisting the building process of all the 2D elements, as well as the more complex three-dimensional sections of the submersible pontoons. «These highly exposed, 3D curved sections required a thick layer of structural foam. To minimise resin uptake in the areas where the foam panels inevitably open up at the cuts, Gurit supplied two sheets of knife DoubleCut Gurit®Corecell™ M structural foam which were bonded together and combined with the carbon fibre outer and inner skins in one infusion process», explains Piet Heydorn, Technical Sales Manager of Gurit. Spabond 340LV was used for the structural bonding of parts, while Ampreg 22 was chosen for secondary bonding and wet lamination.

### Re-designing the second generation

Based on building experience and commercial success, Danish Yachts was keen to further improve their



A FEA model helped identify where loads could best be supported and allowed to optimise the laminate thicknesses.

concept before commencing the build of the fifth vessel. «Gurit was engaged to take a fresh look at the structural design of the whole vessel to bring the weight down further», adds David Olsen, Structural Engineer with Gurit. The second generation is again some 15% lighter. «Part of the job was to further optimise our existing superstructure design. Based on discussions with the customer and Det Norske Veritas as certification body, and by developing a more optimal structural arrangement, we succeeded in safely reducing the skin and core thickness of many panels. In order to re-design the hull structure, we created a finite element model for the full vessel. This enabled us to identify those parts of the main structure which are most effective in supporting the complex combination of global loads and those where laminate





The superyacht heritage shows in the top standard of the vessel's finish.



thicknesses could be reduced or, in some cases, where elements could be removed from the structure altogether», Dave added.

The fifth SWATH was again built at Danish Yachts' shipyard in Skagen. It was delivered to «Odfjell Wind» in early summer, destined for E.ON. «What's more, Danish Yachts has started a new 32 m SWATH project for the Oil and Gas industry, where Gurit again provides structural engineering services and the full materials package», added Patrick von Sydow, CEO of Danish Yachts.

#### For more information

 [www.danishyachts.com](http://www.danishyachts.com)

 [bit.ly/GuritShape3](https://bit.ly/GuritShape3)

#### CORPORATE NEWS

## Driving excellence in sales



Gurit has implemented a customer relationship management system to drive excellence and consistency and make Gurit easier

to do business with. It centrally consolidates and stores key customer information from all 13 production sites. To manage and deliver the project, Gurit has brought together a global team of experienced staff with sound commercial knowledge and a good understanding of Gurit's sales process and internal workings. They have facilitated personalised configuration of the system by the internal IT experts to meet the sales teams' needs and trained staff in its use. Microsoft Dynamics, the implemented CRM, is a secure cloud-based solution that enables the sales team to share data, such as contact details or new business opportunities in the pipeline with colleagues at other sites, without the need to manually produce reports or spreadsheets. It provides the sales account managers a tool to capture key action points from sales calls and meetings, assign tasks to colleagues or for follow up in one place, ensuring effective project management and improving communication by reducing the volume of separate email traffic. Plus, through an off-line client, the same information can be entered, retrieved and shared on the move or during on-site customer visits. Email correspondence can be easily sent directly from or automatically to the system and filed securely against customers' records, offering accurate communication traceability and safe document storage. Master data from a wide range of different ERP systems have been coordinated and enhanced within the CRM system which produces charts and reports at a mouse click. Account managers can keep clear track of sales trends and projects they are working on via Dashboards, helping them to prioritise workload and progress actions to meet required deadlines.

# Attracting and entertaining the crowds

Mid-May saw the re-opening of the Mardyke Gardens at Cork's Fitzgerald Park. The new section adds colour, fun, and a futuristic appeal to the park and attracts townspeople and visitors alike. One of the most prominent new features is a composite pavilion bandstand.



Built in two sections on the Isle of Wight, shipped to Ireland and mounted on site in Cork, the performing arts pavilion has already become an enchanting backdrop for wedding photos.



The new Mardyke Gardens were officially opened by the Lord Mayor of the Irish city of Cork, and Fáilte Ireland, Ireland's National Tourism Development Authority, on May 16th. The Euro 2.3 million project was designed and created by Cunnane Stratton Reynolds, a multidisciplinary practice of town planning, urban design and landscape architecture. The new park delivers a refreshing new take on traditional recreational pursuits associated with Fitzgerald's Park: Apart from horticultural displays and serving as a favorite setting for social gatherings, the Mardyke Gardens will also attract visitors on its spacious front lawn. A spectacularly shaped new pavilion will host a variety of performances entertaining the crowds with music, theatre, recitals and outdoor cinema.

«A shape like that just calls for advanced composites today», says Mark Hobbs, structural engineer at Gurit (UK). When Darmody Architecture presented its idea for the bandstand, two ways of constructing the structure were initially discussed: a steel structure

clad with panels or a structural composite shell structure. AM Structures, a specialist in large-scale composite structures, eagerly teamed up with Gurit as engineering and materials partner and convinced the architects to opt for a complete fibre reinforced composite structure.

«Cork can be a windy place. And a canopy resembling a paraglider just about to take off really catches the wind», Mark was pointing out some of the structural engineering tasks. «As the pavilion was to be built on the Isle of Wight, it needed to be transported to Ireland. To make transport easier, the large structure was divided into two sections. The nose of the canopy was manufactured separately and only bolted back on in Cork.» The major structural task, however, was to design the integrated shells and internal web structure. This structural system not only has to support the canopy, but it has to be able to cope with complex dynamic load cases to withstand gale force winds. All the loads need to be directed through

the shell into the internal grid structure and down to the brackets integrated inside the shell on either side of the organically shaped canopy. «This involved some detailed analysis work. After carrying out initial design work, the engineering team used a finite element model to optimise the internal structure and laminates», Mark recalls.

The canopy was successfully transported across the Irish Channel to the South of Ireland and installed in time for the re-opening of Cork's favorite civic amenity. Together with the originally meant-to-fly «Sky Garden pod», now turned into a viewing platform over the river Lee, the iconic bandstand is sure to put Fitzgerald Park and especially the Mardyke Gardens on the itinerary of all visitors of Cork and the South of Ireland.



# A fresh look at producing carbon fibre Spar caps

**With its new spar cap tools, Gurit takes its innovative low-void airstream technology yet another step further, introducing an efficient and effective way to manufacture low-void, unidirectional carbon fibre spar caps. We want to share this technology and invite customers and interested parties to book a demonstration on this prototype tooling, so they can see the benefits of Airstream up close.**

Designers and manufacturers of wind turbine blades agree that longer, narrower blades benefit from carbon fibre spar caps to reduce weight and improve performance. Traditionally, unidirectional carbon fibre spar caps are either infused, pultruded or manufactured using various forms of prepreg.

«Gurit's airstream material and technology has been developed to manufacture thick low-void laminates at ambient temperature, while removing a number of other traditional prepreg barriers», says Sam Pickard, Lead Technical Support Engineer at Gurit (UK). «Every manufacturing technique is different in terms of materials consumption, process complexity, cost and quality of the final part. The market is driven by quality and cost.»

## Looking at the full equation

The material cost per kilogram of infused spar caps is cheaper but looking at the full equation and



**Solid carbon prepreg block.**

considering key variables, such as the improved mechanical and fatigue performance of SparPreg™ Airstream™, a reduction in the quantity of material is achieved. Therefore, the cost of using of SparPreg™ Airstream™ is soon on a par with, if not more competitive than, other technologies.

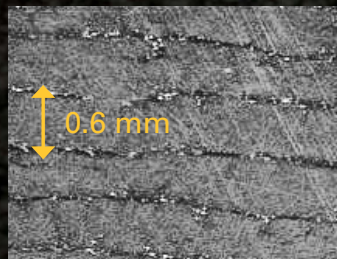
«The quality side of the equation clearly points towards using Gurit's Airstream™ material. Our focus was on removing traditional prepreg barriers and making the manufacturing process again more

efficient and effective», Sam added. Carbon SparPreg™ Airstream™ has been proven to manufacture spar caps with a void content under 0.5% and excellent fibre distribution and straightness. This ensures that the mechanical properties achieved on coupon level are also seen in the final spar cap.

The material engineers teamed up with the Group's processing and tooling experts. The result of this joint effort is the introduction of special spar tool.

## Spar cap tools facilitate manufacturing

The new advances have improved the capabilities of the tool, and will now also accelerate our material developments. The main task of the tool, however is to be used to invite customers to evaluate the carbon SparPreg™ Airstream™ product. This will develop technical understandings and aid qualification processes with the blade designers and manufacturers.



**Low-void carbon laminate.**

## Moving yet closer to APAC customers

In response to increasing demand for composite applications, Gurit has appointed two new distributors in the APAC region: Supbon Co., Ltd. as a reseller of its complete product range in Thailand, and Nuplex Composites as a new distributor for its Gurit® PVC materials in Australia.

Gurit already has a good customer presence in South-east Asia and sales representation in Malaysia, also supporting customers in Indonesia, Singapore, Thailand and Vietnam. With Supbon's local support, Gurit's customers will now benefit from faster product delivery times, further complemented by Gurit's manufacturing site in China, allowing for on-time supply throughout Asia.

With over 40 years of experience in the composites industry, Nuplex Composites has become the leading supplier of composites in Australia. Gurit believes that this partnership serves to reinforce its commitment to the Australian market, and that it will further enhance the service to its Australian customers, both technically and commercially.



Prepeg laying cart.

### The new tool design has a number of new features including:

- More intelligent thermocouple control allowing for smarter cure cycles
- Increased flexibility and reactivity to cure cycle design
- Reduction in curing time
- Improved heat distribution
- Improved spar cap layout process

The tool can also be used to replicate the capabilities of any customer tool, allowing us to demonstrate that SparPreg™ Airstream™ can be used on traditional infusion tooling technology, because its low exotherming characteristics remove the need for high Tg tooling.

The manufacturing method uses a specially designed cart to semi-automate the process by laying the prepeg tape directly down the length of the spar cap mould. This increases production speed and ensures the optimum fibre straightness offered by prepeg technology. This process has been used successfully by current Gurit customers.

«I am excited about showing our customers these technologies and demonstrating the step improvement in quality obtained when using Carbon Airstream», Sam said.

### Book a demonstration

If you would like to learn how this new technology can improve the manufacture of spar caps or any other thick, low-void carbon laminates, please contact [Sam.Pickard@Gurit.com](mailto:Sam.Pickard@Gurit.com) to book a demonstration on the prototype tooling.

# Nomad IV wins award

for her innovative  
naval architecture



The French naval architects Finot-Conq have provided large production builders with stunning designs, created some of the fastest racers (such as IMOCA 60s or the Pogo series), and developed many custom-built racers/cruisers. Now they have won both the ShowBoats Design Award 2014 in the category Naval Architecture and the International Yacht and Aviation Award 2014 for their very first 100-foot sailing yacht. Gurit was entrusted with validating key structural aspects and provided a large materials package for the build.

#### Speed and elegance...

The brief for the Finot-Conq 100 was demanding: The owner asked for the fastest cruising 100-footer in the

world, which should sail close to maximum speed without heeling more than 12 degrees. The luxury sailing yacht should provide spacious accommodation for twelve guests who are looked after by a crew of up to four, and – when moored – the cockpit should allow the owner to invite 50 people for parties. The chined hull, the mast rising to a towering 46 metres supported by running back stays to allow for a square-top mainsail, and many eye-catching carbon features underline her racing spirit. A lifting keel that draws between 5.9 and 3.5 meters, lateral 9-ton ballast tanks, twin rudders, and her full carbon composite construction also contribute to her performance.

The large open cockpit is another striking feature of Nomad IV: Under sail, it allows for separated guest and technical areas, as well as a large aft sundeck. The stern door of the tender garage also serves as bathing platform. When moored, the uncluttered cockpit clearly fulfills the wish to host sumptuous parties. The panoramic coach-roof allows 360° vision from the



deck saloon. The master and three guest cabins are located in front of this saloon. A fourth guest cabin, as well as the galley, the technical compartment, and the crew area including two cabins, a crew mess and two bathrooms are located aft.

### ...convince the jury

The 30.48 m yacht easily convinced the naval architecture subcommittee and the grand jury of the ShowBoats Design Awards 2014: Nomad IV was applauded for its fresh approach to problem solving and application of technology such as water ballast.

Nomad IV also received the International Yacht & Aviation Award 2014 for its ground-breaking design, an award obtained from thousands of internet votes.

### Structural design validated by Gurit

While Finot-Conq has a well experienced structural design team, they engaged Paolo Manganelli, Senior Engineer with Gurit, to validate and double-check many of their own calculations to maximise the performance of their first 100-footer. Paolo explained: «Nomad IV is a perfect synthesis of all the experience built by Finot-Conq through their many and successful offshore racing and cruising yacht designs. The collaboration between Gurit and Finot-Conq started on IMOCA 60s, extreme racing yachts built for the Vendée Globe round-the-world race. For Nomad IV, the challenge was to accommodate the design loads and weight targets typical of a high performance racer without getting in the way of a spacious and comfortable interior. This challenge was met through the use of the most advanced prepreg and core materials and a flawless construction by Maxi Dolphin. It was a real pleasure for us to collaborate again with all the team at Finot-Conq and Maxi Dolphin.»

### Strong and successful relationship

David de Premorel, Project Manager at Finot-Conq, added: «Nomad IV was indeed a very intense project for our company, and Gurit's experience in large yachts allowed us to be more efficient in our structural engineering. We are very pleased with the yacht, and the ShowBoats Design Award is a wonderful outcome for this project.»

The unique proportions with the 8.30 m maximum beam, the far-drawing keel and the towering mast resulted in some extraordinary load cases for a yacht of this length and called for meticulous engineering and flawless build: Luca Botter, Maxi Dolphin's Sales manager, declared: «Nomad IV is the most recent yacht built in co-operation with Gurit and the latest addition to a very positive professional association. The relationship between Maxi Dolphin and Gurit has been profitable and long lasting. It started back in 1998, and since then, each and every new project has been dealt with following their advice on new materials and innovative construction systems. As a result, from the Frers' designed MD118 Viriella to the brand new Nomad IV, all our yachts have benefited from the structural engineering and state-of-the-art manufacturing techniques developed by Gurit. Another project to mention is the MD51 power boat, where Gurit's SPRINT™ construction method was introduced and allowed us to deliver a very light, 10 tonne displacement boat.»

Nomad IV is almost entirely built in carbon fibre, and Maxi Dolphin has again selected a wide range of Gurit composite products, including SE 84 carbon fibre prepregs, Gurit®Corecell™ M structural foam, Ampreg 21 resin for wet laminating and Spabond adhesives.

# Big is not long enough for long

**Gurit is expanding the working envelope in its tooling operations. «When our purpose-built production campus was inaugurated in 2012, the 84 metre-long buildings seemed to be huge. Only two years later, we are expanding them to a stunning 108 metres», says Bing Chen, Managing Director of Gurit Tooling (Taicang).**

With its state-of-the-art manufacturing campus at Taicang/China, Gurit is globally the biggest independent developer and manufacturer of wind turbine blade moulds. Besides, Gurit Tooling has established itself as an important supplier of complementary metal structures, such as transportation racks for wind turbine tower elements, or blade, as well as mould turn-over systems.

The scope of its activities has seen an impressive expansion in terms of average size of the individual tools. As the quest for ever longer, better performing and greener wind turbine blades continues, Gurit Tooling is currently expanding production halls to accommodate orders for moulds of up to 100 metres.

When Gurit acquired the tooling business in 2009, the average mould length was just over 40 metres,

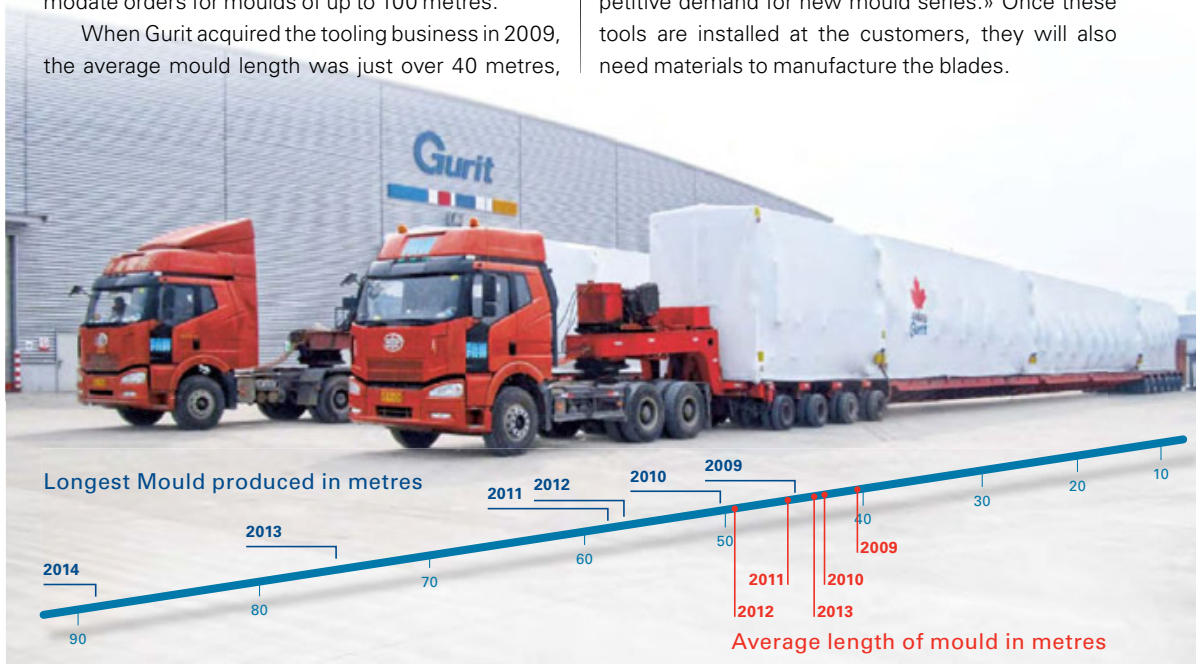
with the longest moulds barely exceeding 45 metres. The average length has greatly increased since to almost 54 metres on average last year. Even more so, current orders for wind turbine blade moulds today include tools of almost 90 metres.

Bing Chen is very pleased about the performance of Gurit's tooling business. «We are currently witnessing the strongest market demand in three years. In the first half of 2014, we have already built 17 moulds,



«The new addition to our manufacturing hall gives us the option to accept orders for moulds of up to 100 metres», Bing Chen specified.

while we built 23 in all of 2013. Very encouraging not only for the tooling activity, but for the whole wind energy side of Gurit, is the fact that we see more repetitive demand for new mould series.» Once these tools are installed at the customers, they will also need materials to manufacture the blades.



# Gurit's new manufacturing plant in Hungary on-stream

Gurit's new manufacturing company in Hungary has successfully started production this spring. The new facility serves as a continental European hub for Gurit's Composite Systems and Engineering unit.

«Gurit (Hungary) Kft. is an important addition to our operations», says Rudolf Hadorn, CEO of Gurit. Previously, Gurit's Composite Systems and Engineering Business Unit consisted of structural engineering services which are provided globally, and comprised the tooling facility in Taicang/China, the automotive parts manufacturing factory, and a prototyping site both on the Isle of Wight/UK. «Now we also have a strong and competent presence in continental Europe», Rudolf added.

The new facility in Székesfehérvár, only one hour from Budapest, was founded to serve the Composite Systems and Engineering business unit as continental European manufacturing hub for composite components and to provide the option for significant future capacity additions. «For the time being, we operate in a floor space of 3000 m<sup>2</sup>», says Joe Summers who led this expansion project at Gurit. «Yet, the site can easily be expanded significantly as demand grows».



To facilitate a smooth start-up, the core Hungarian team was first trained in the UK. Over a period of three months, the team worked closely with their UK production colleagues to learn all the project and process characteristics. At start-up, the core team returned to Hungary, supported by some UK specialists on-site, and were able to train the additional required employees to allow a seamless transition to the new site.

The Hungarian company is led by Ing. Gábor Balogh, as Site Manager of Gurit (Hungary) Kft., and his experienced management team, who all joined Gurit in November 2013. They all bring with them significant experience and industry recognition in composite bus manufacturing.

Gurit (Hungary) Kft. is currently focusing on the manufacture of finished composite parts for the European bus industry and on certain car body parts for prime European car manufacturers. Lightweight composite components offer considerable advantages in transportation applications: In small to medium volume production niches, composites offer a lower program cost (tooling and piece price total) than alternative metal parts. They increase fuel efficiency (or electric vehicle range) as the vehicles become lighter as a whole, also reducing emissions. And finally, as Formula 1 demonstrates, the lighter the car, the better the performance!

# Sebastien Col – Gurit's new «foiling» brand ambassador

Sebastien Col is taking a new step up in his career with the ultimate goal of coming back on the America's Cup, now organised on foiling boats. Gurit is supporting Sebastien Col as official sponsor.

After having sailed at the highest level as a helmsman on the World Match Racing Tour, the America's Cup, and on prestigious racing circuits such as the RC44 and the TP52 circuits, Seb Col is taking a new turn in his career with the challenge of sailing as much as possible on every type of foiling boat to develop his skills.



## America's Cup as ultimate goal

Sebastien Col explains his ambition: «After Valencia in 2007, we have carried on working with the French team ALL4ONE, sailing the Louis Vuitton Trophies and the Audi MedCup in TP52, but many changes occurred, and the America's Cup switched to a new format on multihulls, and the project stopped. I had already realized in 2010 that I wanted to complete my America's Cup and match racing experience by some multihull sailing. So, I started to sail where you could actually get the best experience you can hope for: sailing offshore on big multihulls. I joined Michel Desjoyeaux and Foncia's MOD70 project in 2012, did two transatlantic races and one European Tour. Thanks to my good results, I then had the chance to join team Edmond de Rothschild's MOD70 Gitana in 2013,



Seb Col spends as much time as possible on foiling boats like Moths and GC32s. Being at the helm of a GC32, Seb just broke the speed record with 37.9 knots.



we won all our races, and I found myself definitely addicted to multihull sailing. I was doing other interesting projects on top level monohulls at the same time, and I still do, but I realized that the America's Cup had always been what I really wanted to go back to. When I watched the 34th America's Cup regattas on foiling AC72, and the outcome with Oracle Team USA's win, everything became crystal clear about what the future would be made of. Besides, having always had a strong interest in technology since I studied composite materials and worked in my father's boatyard while I started to compete in match racing, I can easily say that the technology side of the America's Cup has always attracted me, probably as much as the sailing side.»

### Joining the «Mothies» and...

Seb has started his summer of sailing on foiling boats with the Moth Italian National Championships in early July on Lago di Garda/Italy, then followed by the 2014 Moth UK National Open Championship and the Moth World Championships, both at Hayling Island, Hampshire/UK. «The Moth in particular is helping me make fast progress on foilers, even if I will need to spend a huge amount of hours on the water», Seb comments. 2014 is a quantitative and a building phase for Sebastian: «I don't have results targets, which would be unrealistic at this stage. My priority is to learn as much as possible. Besides, I also need to test as many boats as I can to get a maximum of information, in order to build the second phase for 2015 from there with my

own project, possibly a GC32, which should also help me to achieve the goal to join an America's Cup team at some point», Seb added.

### ...breaking the speed record on GC32s

A GC32 might indeed be a good choice for him as he proved on July 10: He was actually at the helm of a GC32 in a test session organized by a French sailing magazine. Seb chose a crew of experienced «Mothies»: Josh McKnight (2012 World Champion), Chris Rast (Swiss Champion), and Benoit Marie (Winner of the Mini Transat). He really excelled on the GC32 when Seb Col and his crew broke the speed record for the GC32 in 25-30 knots of wind reaching 37.9 knots! Congratulations!

## TECHTALK

# New electric mould heating system

Gurit Tooling is introducing a new control system for its electric mould heatings. Customers benefit from a state-of-the-art graphic user interface and from a greatly enhanced protection against damages through electrical static discharge.

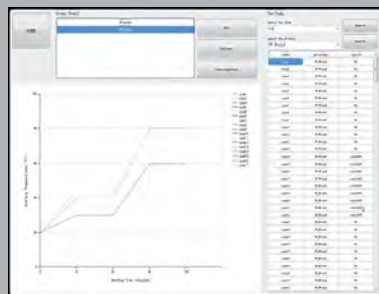
A wind turbine blade mould is normally divided into 100-360 heating zones, depending upon the blade structure design. Each zone includes two temperature sensors, two overheating safety switches and, of course, heating wires which are applied inside the mould. The power, which is supplied to these heating resistors, is now controlled, configured and managed by a programmable logic controller (PLC) via an intuitive touch screen.

While the main electrical cabinet controls the overall configuration of the heating or curing operation, up to eight profibus-connected heating cabinets manage the power supply of 8 to 24 electrical resistors of 5 to 32 Ohm in the various heating zones by means of solid static contactors (SSC) which control the electrical power with PID modulation.

The system is thus capable of controlling up to 192 individual heating zones of an individual mould shell in one control loop.

The safety relays of each heating cabinet can be activated via a «Heating» or «De-Moulding» override function to protect the tool against damage through electrical static discharge. The voltage applied to the individual heating wires with a resistance of less than 25 Ohm is controlled in electrical transformer cabinets.

The new system is very robust, uses standard components, and fully complies with CE conformity requirements. It offers real time temperature charts and data backup.



Real-time information and control functions via touch screens.

# Sports fishing in lasting comfort

North Queensland, Australia is famous for its world-class big-game-fishing. Typically, the unforgiving and treacherous ocean conditions of Australia do not allow for a comfortable adventure. With the help of Gurit's composite materials and vessels renowned for their speed, sea-keeping qualities and soft, dry ride, Assegai Marine has set the standards in performance and comfort in game-fishing. SHAPE visited the famed yard.

Assegai Marine's speciality is purpose-built custom sports fishing vessels built to survey standards and constructed using strip-plank cedar and epoxy resin. The company's list of just 15 builds over the last 25 years isn't particularly long, but Barry Mar-

tin, Assegai Marine's family business owner, designer and builder, has every reason to be very proud of it: Many rank him amongst the finest custom boat builders in the South Pacific, including Sir Michael Hill, founder of global jewellery retailer Michael Hill Jewellers:

«Thank you for your dedication and passion in producing «Amokura». I see thousands of people in business, but no-one with the commitment that you have shown.»

## Designed and built for lasting comfort

Barry Martin's philosophy is to provide ultimate and lasting comfort for all aboard, so each Assegai boat has been designed and built to extremely high standards inside and out. Comfort is achieved with rigorous sound-proofing and vibration standards, but it is the vessel's unique design feature, with its convex and slightly raised transom, that ultimately achieves its ability to carve through the waves and go safely back down hard in rough sea. Let's have a closer look at Amokura, originally launched in 2001 and still in perfect shape: Her strength is derived from her western red cedar strip plank construction. The 57 foot hull was built using a male mould with strip plank cedar above the waterline, and Gurit® Corecell™ M structural foam on the bottom with 130 kg/m<sup>3</sup> density. The foam structure was glassed-over using quad-axial fibreglass, and the cedar used tri-axial, both third-party products supplied by Gurit. Four



Amokura, built for Michael Hill, New Zealand.

main engine girders run from transom to forward and were all fibre-glassed into place. The bulkheads were constructed of solid plywood while deck and the cabins were constructed of balsa with solid plywood, and then fibre-glassed inside and outside.

### Worker-friendly Gurit materials

Gurit's Ampreg 22 is Assegai Marine's chosen epoxy laminating resin. With all vessels, each layer of glass fabric is hand-placed and rolled out to give the maximum lamination strength. Between cured layups, the builders also meticulously hand-sand the surfaces to prevent any possible voids or un-laminated areas. This labour-intensive technique requires skilled craftsmen, but provides the standards required for constant offshore work. Barry's core value of customer comfort is

applied to his company's working environment, and he is all too aware of the risk in the boat-building industry of losing quality staff through using non-worker friendly materials: «The guys all love working with Ampreg 22, as it is has no volatiles, no nasty fumes,» says Barry.

### Gurit® Corecell™ M – the choice for Assegai's next-generation power cat

While Assegai Marine's custom made sports fishing boats have gained the company its legend status among the top Australian skippers, Barry Martin is aware of the risk of pursuing a niche focus. «Our next build is a power cat,» Barry reveals. To achieve the required lightweight structure, Gurit® Corecell™ M is Barry's loyal choice for what he recognises as the next generation of boating. «A catamaran offers more com-



Barry Martin, esteemed Owner and Designer, Assegai Marine, Gold Coast, Australia.

fort than a monohull in a following sea, as a mono will plough into the front wave as they come down, then turn when they plough into the next wave.» SHAPE will stay tuned on this project!

Assegai Marine is a customer of CG Composites Australia, a distributor of Gurit's advanced composite products in Queensland/Australia.

## CORPORATE NEWS

# Thank you, Robert!



At this year's Annual General Meeting of Shareholders, Robert Heberlein was no longer available for re-election. Although he does not look like it, he has

reached the age limit defined for Gurit Board members. Robert Heberlein had served on the Board of Directors of Gurit Holding AG and former Gurit-Heberlein AG as Chairman from 1984 until 2004 and from

2005 as member of the Board of Directors. With Robert, the last member bearing the name of the Heberlein family who had founded the company in 1836 has now stepped down. Yet, as the Heberlein and Huber families are related, the direct representation of these two families as anchor investors in Gurit continues, as Nick Huber, Member of the Board of Gurit, observed at the AGM in his witty farewell address for Robert. SHAPE would like to join Nick in thanking Robert Heberlein for his decades of leadership at Gurit. Thank you, Robert.

# Gurit Agenda 2014-2015

Gurit will showcase its wide range of material packages, engineering solutions and technologies at a trade show near you. Our teams look forward to meeting you at the following shows:

- **China Composites 2014, Shanghai / China**  
03–05 September 2014, Focus: All markets, Engineering
- **SPE ACCE, Novi / MI / USA**  
09 September 2014, Gurit presents a paper, Focus: Automotive
- **SAMPE Asia 2014 and Korea Composite Show, Goyang/Korea**  
16–19 September 2014, Focus: all markets
- **Innotrans, Berlin / Germany**  
23–26 September 2014, Focus: Transportation, Engineering
- **Auckland On Water Boat Show, Auckland / New Zealand**  
25–28 September 2014, Focus: Marine
- **59th FRP CON-EX 2014, Kyoto / Japan**  
02–03 October 2014: All industries, Engineering
- **Composites Europe 2014, Düsseldorf / Germany**  
07–09 October 2014: All industries, Engineering
- **CAMX (Composite and Advanced Materials Expo), Orlando / USA**  
14–16 October 2014, Focus: All markets, Engineering
- **Materialica, Munich/München / Germany**  
21–23 October 2014, Focus: All markets, Engineering
- **SEMA Show, Las Vegas / USA**  
04 November 2014, Focus: Automotive
- **Composite Engineering Show, Birmingham / Great Britain**  
11–12 November 2014, Focus: All markets, Engineering
- **METS 2014, Amsterdam / The Netherlands**  
18–20 November 2014, Focus: Marine
- **India Composites Show, Mumbai / India**  
10–12 December 2014, Focus: All markets, Engineering
- **Performance Racing Industry, Indianapolis / USA**  
11 December 2014, Focus: Automotive
- **ICERP 2015, Hyderabad / India**  
29–31 January 2015, Focus: all markets

For details on Gurit's sales/distributor network: <http://www.gurit.com/sales-and-distributors.aspx>

For general enquiries, please visit: <http://www.gurit.com/contact-form.aspx>



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