


A photograph of an Ariane 5 rocket being launched. The rocket is white with blue and red accents, and is surrounded by a large plume of white smoke and fire. It is being supported by two tall, lattice-structured towers. The sky is blue with some clouds. The word 'Gurit' is in the top right corner.

Gurit

shape

The Gurit Magazine
Issue 05, October 2009

Keep wind turbines turning. It is rocket science. Turnkey marine materials and service package. CATIA CAD design suite. The Gurit Code of Conduct. Introducing M-Foam.



Dear Reader,

In the first half of 2009, Gurit achieved its target of maintaining the operational performance level of 2008, despite a sales decline in our target markets of some 12% at constant currency translation rates. Ongoing operational improvements, further progress in Group-wide purchasing, together with rapidly introduced and often painful cost-saving measures compensated the negative effects from lower sales and thus lower capacity utilization. Gurit closed the period with a strong balance sheet and a remarkable net cash position. Our healthy financial status gives us good reason to look ahead with confidence, although we expect markets only to broadly recover next year.

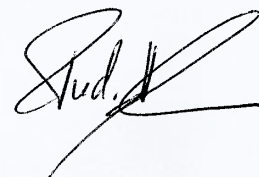
In troubled times like these, it is very important to stay focused on the longer-term perspectives. Gurit pushes firmly ahead with its strategy implementation. While our global capacities are not fully loaded, we concentrate on even further improving our equipment, on training our colleagues, on exploring new market opportunities. Doing so, we build a solid foundation for future success.

We enhance our positions in all our target markets by providing our customers with tailor-made solutions, expanding our role as a leading materials and technology provider in advanced composites and by expanding our addressable markets. In this edition of SHAPE, we invite you to discover how Gurit contributes to bringing satellites safely into space, to making passenger ferries more fuel efficient, to helping expand the life span of wind energy generators and to speed up automotive design projects.

With our materials and technologies, Gurit contributes to making our one world more sustainable. Doing business globally, we also acknowledge the importance of adhering world-wide to high standards, be it in terms of environment, health and safety, in terms of employer relations, or with respect to our business conduct. Our efforts are widely recognized wherever we do business: Gurit (Tianjin) – for instance – was just presented with a prize for special social achievements in the Tianjin Economic Development Area, TEDA, in China. The various high standards Gurit sites and Gurit employees have been traditionally complying with locally have now been integrated into our Gurit Code of Conduct also presented to you in this edition of SHAPE and on the Gurit website www.gurit.com.

Yours sincerely

Rudolf Hadorn, CEO



Contents

Corporate News ⁰⁴ Gurit (Tianjin) recognized for outstanding employee relations ⁰⁴ Governor of the Bank of England visits Gurit (UK) ⁰⁴ Gurit (Tianjin) receives ISO 14001 certification and is recognized for outstanding employee relations ¹⁰ An interview with Robin Price, Chief Purchasing Officer ¹⁷ Sticking to strategic priorities **Markets** ⁰⁶ Six hours – and the new bridge was there ⁰⁸ It is rocket science ¹² Crossing over to Copenhagen's Opera now saves 50% energy ¹⁴ Keep them turning ²⁰ Turn-key materials and services package **TechTalk** ¹¹ CATIA reduces design and development time ¹⁸ M-Foam – the foam for all marine applications **Being Gurit** ⁰⁵ Automotive Press Tour ⁰⁵ Gurit congratulates MBPV ²² Our Website in Chinese ²² Get on your bikes ²³ The Gurit Code of Conduct

Imprint: Gurit Holding AG, Group Communications

Editor in Chief: Bernhard Schweizer

Thank you for your feedback at SHAPE@gurit.com

Pictures courtesy of: Ruag Space/ESA (1, 8, 9), Aston Martin (5, 11)

Rail Media Group/Birse Rail (6), www.schmid taps.com (12/13 landscape), EWEA/Vestas (14, 15, 16)

Nautor/Swan (20), istockphoto (22, 23) and Group company photo archives

Concept and Design: Gurit and Eclat AG, Erlenbach

Cover: Gurit supplies prepreg materials for the payload fairings of the Ariane 5 rockets.

Inside Cover: Windwand, designed by Ron Arad, is made from Gurit carbon fibre prepreg.

This 50 metre needle pierces the sky above Canary Wharf in London.

GURIT (TIANJIN) RECOGNIZED FOR OUTSTANDING EMPLOYEE RELATIONS

The Tianjin Economic Development Area (TEDA) is the most successful inward investment region in China, attracting billions of dollars of foreign investment over the last 20 years. With over 4000 companies present, TEDA boasts 76 subsidiaries of «Fortune 500» companies. To celebrate the achievements of the Foreign Invested Companies, TEDA honoured 20 outstanding General Managers who they felt had contributed to the local society and business success of TEDA. Phil Harnett, General Manager of Gurit (Tianjin), received one of the 20 prestigious awards. The jury not only focused on the financial success of the companies but also on how they contribute to society. Training and staff development, labour relations, working atmosphere or staff turnover were important criteria as well as compliance with local environment, health and safety laws and policies or the general factory safety and cleanliness.



Gurit achieved remarkable rankings in a number of categories. For instance, Gurit (Tianjin) is reported to have the lowest personnel turnover of all factories in the area. In addition, Gurit's outstanding record of having had only three minor accidents since its opening two years ago was also mentioned. Last but not least, it was noted with thanks that the staff of Gurit (Tianjin) generously donated more than 20,000 RMB to the Sichuan earthquake fund. Our picture shows Phil Harnett receiving the award from Mr Li Yong, the Secretary of Party Leadership Group.

GOVERNOR OF THE BANK OF ENGLAND VISITS GURIT (UK)

Gurit (UK) had the pleasure of welcoming Mervyn King, Governor of the Bank of England, to its premises on June 19, 2009. The Governor visited Gurit and other companies on the Isle of Wight to get a first-hand picture of the economic environment within the region. As Governor of the Bank of England, Mervyn Allister King holds the most senior position in the Bank of England. The Governor is also Chairman of the Monetary Policy Committee, with a major role in guiding



the British economic and monetary policy, and is therefore one of the most important public officials in the United Kingdom. He accompanied the Bank's central Southern England agent, Chris Piper, on his visit to Gurit (UK), as well as other businesses on the Isle of Wight. Feedback received from these businesses is used by the Bank to compile a picture of the economic environment and the issues being faced within the region. At Gurit, the Governor was received by Graham Harvey, General Manager Marine and Managing Director of Gurit (UK), and Mary Spradbery, Head of Finance at Gurit (UK), and was treated to a tour of the Gurit premises and the operations factory before meeting management to be updated on current market conditions.

GURIT (TIANJIN) RECEIVES ISO 14001 CERTIFICATION

Gurit (Tianjin) is pleased to announce that the company has been awarded the ISO 14001 certification for its Environmental Management Systems. Human Resources Manager Christina Yin (in red blouse) who is also responsible for EH&S at Gurit (Tianjin) had coordinated the process for the independent audit made by Det Norske Veritas.



AUTOMOTIVE PRESS TOUR

In late August, Gurit (UK) had the pleasure of welcoming a group of VIP automotive journalists including Autocar and Car Design News to the new UK based Automotive facility. The two-day press event was arranged to launch the facility to Gurit's target automotive and trade press and highlight the benefits of carbon composites in automotive design. The first day of the tour started with an introduction and tour of the Gurit (UK) plant followed by presentations and interactive displays on the benefits of composites in car design given by both Martin Starkey, Managing Director Automotive, and the esteemed Automotive Designer, Peter Stevens. The journalists were then treated to a sail across the Solent from Yarmouth to Lymington in a Jeanneau 45.2, followed by an intimate dinner party hosted by Gurit and Peter Stevens in the Stanwell House hotel, Lymington. The agenda



continued the following day with a VIP tour around the Aston Martin plant in Gaydon in which the guests viewed how the new technology carbon body panels are fitted to the DBS Coupé and DBS Volante – the two models that feature Gurit made Class A carbon car body parts – and how they integrate alongside more established body technologies, such as aluminium.



MBPV SUCCESSFUL ON ITS RECORD HUNT

SP, the marine business of Gurit, are proud to be part of the composite engineering team for the Maxi Trimaran Banque Populaire V (MBPV), the 40 metre by 23 metre boat. On Sunday August 2, 2009, this boat – engineered for a record hunt/SHAPE Nr 4 – beat the historic west to east transatlantic record and secured the fastest 24 hour run time, breaking the previous record by a staggering 12 hours, 32 minutes and 6 seconds. Congratulations to Skipper Pascal Bidégorry and his sailing team, the architects VPLP and all the MBPV team. During the race, which began in New York on July 30, 2009, at 22h 47m and which concluded at Lizard Point off Cornwall, at 16h 13mn 13s (French time) on August 2, skipper Pascal Bidégorry and his eleven person crew on board the MBPV also set a new 24hr record of travelling 908 miles at an impressive average speed of 37,8



knots. Franck Cammas on Groupama 3 also set off to beat his own record just under 3 hours earlier, but then finishing eleven minutes after MBPV. From the outset of the boat's development, the world-leading French multihull naval architects VPLP, who designed MBPV, had ambitions for the boat to become the largest and fastest offshore sailing trimaran on the water. They aimed to challenge and beat all existing offshore sailing records, and utilized advanced composite materials and the 20 years of experience of SP in conjunction with HDS to develop the boat structure which would go onto achieve this in triumphant style.

Gurit (UK) empfing im Sommer den Governor der Bank of England und organisierte eine Tour für die Automobilpresse. Gurit (Tianjin) ist nun ISO 14001-zertifiziert und wurde unlängst als beispielhafter Arbeitgeber ausgezeichnet. 今年夏天，固瑞特（英国）接待了英国银行行长的来访，并且成功地举办了一场汽车之旅活动。随着自行车价格的降低，固瑞特英国公司越来越多的同事选择骑自行车上下班。固瑞特（天津）已通过ISO14001的认证，并且最近被评为优秀经理人。

Modular bridges

SIX HOURS – AND THE NEW BRIDGE WAS THERE

In nur sechs Stunden wurden vier aus Gurit Prepregs gefertigte Elemente an Ort und Stelle zu einer praktisch wartungsfreien Fußgängerbrücke zusammengefügt.

桥 四个用固瑞特预浸料制造的可随时安装的部件已放置到位，只用了不到六个小时，便安装组成了免维护的人形桥。

The Bradkirk footbridge over the main Preston-Blackpool railway tracks in Britain was built by AM Structures Ltd on the Isle of Wight using Gurit's composite technology and materials. The four ready-to-install parts of the bridge were craned into place and up for years of minimum maintenance service in less than six hours.

Structural composites are increasingly used in construction. They offer light-weight, corrosion-free and easy to install solutions using off-site engineered and fabricated elements. Network Rail, the company owning and operating Britain's rail infrastructure, was looking for the most cost-effective way to replace a life-expired steel bridge. The old structure was comprised of two steel latticework spans resting on three brick piers.

DEVELOPING A STANDARDISED BRIDGE DESIGN

Network Rail was keen to trial moulded composite technology to develop a standardised bridge design where the mould could be used for multiple spans. At first, the plug was produced. This is a single-use timber former which serves to form the final shape of the mould. The mould is then made from glass fibre reinforced epoxy resin and can be used up to 500 times.

EFFICIENT MANUFACTURING TECHNOLOGY

The bridge elements – two 12 metre spans and two flights of steps – were manufactured by AM Structures Ltd on the Isle of Wight. Each span is a fully moulded composite monocoque sandwich structure using Gurit's patented SPRINT® epoxy technology materials above and below a structural foam core. SPRINT® prepregs consist of a fibre reinforcement layer on either side of a precast resin film with a light tack film on one face. Unlike conventional prepregs they remain dry and offer easy handling until cured. This also gives SPRINT® materials an outstanding breathability and results in autoclave quality laminate without the expense of using an autoclave.

VIRTUALLY MAINTENANCE-FREE STRUCTURE

The bridge could have been painted using standard epoxy or polyurethane paint, yet Network Rail opted for a long-lasting gel coat finish which gives the best quality finish on the outside, most visible to the passer-by. Apart from routine inspections and the replacement of non-slip finishes and stair noses this composite bridge is practically maintenance-free: the structure is not only corrosion-free, it features a class 0 fire rating meaning that it is self-extinguishing, is very tough and resistant to abuse, cracking and chipping. Each 12 metre span is U-shaped with the parapets forming part of the structure. This shape makes the spans extremely strong and stiff while they only weigh 1.6 tons each. The light-weight elements could therefore easily be transported from the manufacturing location on the Isle of Wight to the final site near Blackpool.

SIX HOURS FOR SIXTY YEARS OF SERVICE

The reconstruction of the Bradkirk bridge was done within three six hour overnight possessions without disruption of the rail traffic. The first six hours were used to remove the life-expired steel structure using an 80 ton crane. In the second six hour interval, new precast concrete cills and stair landing units were put in place using a 200t crane. A small 35 ton crane was sufficient for Birse Rail, the principal contractor of Network Rail, during the third and last six hours in the night of May 17, 2009, to land the four prefabricated elements precisely on the spot. Now installed, they will allow pedestrians to safely cross the railway tracks for the next 60 years at least. For further information: Thomas.royle@gurit.com



Markets: Transportation

Die Nutzlastverkleidungen der europäischen ARIANE 5 und Teile der amerikanischen Atlas Raketen werden bei Ruag Space mit Gurit-Prepregs hergestellt.

欧洲阿丽亚娜5号火箭和美国阿特拉斯火箭的有效载荷装置部分所使用的材料是固瑞特公司生产的预浸料。



IT IS ROCKET SCIENCE!

Gurit high-performance composites have contributed to bringing numerous satellites safely into orbit. Satellites are carried into space by launch vehicles – rockets most people would say. The valuable cargo is installed at the top of the launcher under the payload fairing, which shelters the satellites before and during the start and on the flight through the atmosphere from thermal, aerodynamic and acoustic effects and provides the launcher with an aerodynamically optimized shape.

THE WORLD'S FIRST COMPOSITE PAYLOAD FAIRINGS

The first payload fairing engineered and designed by RUAG Space was for the European ARIANE1 launcher, which made its successful debut on December 24, 1979. While the first fairing generations were based on classical aircraft technology, i.e. aluminum construction, RUAG Space introduced in 1988 the world's first fairing in composite technology based on aluminum honeycomb cores with carbon-fibre-reinforced face sheets. Ever since, RUAG Space uses Gurit carbon and combined carbon/glass prepregs to build about 10 payload fairings per year. «Let's take the example of an ARIANE 5 rocket», says Paul Loeliger, Head of Production at RUAG Space, on a tour through the fascinating production site at Zürich/Switzerland. «Each of these payload fairings is made up of a number of smaller shell elements. The tip of the rocket consists of two 180° ogives while the next lower section is made up of four ogive 90° sections. The last section is then made up of cylindrical extension panels. The finished elements are then shipped to RUAG in Emmen, near Lucerne, where they are combined into two fairing halves.»

IN TWO MINUTES THROUGH THE ATMOSPHERE

«The payload fairing is jettisoned as soon as the launcher has left the atmosphere at a height of about 120 km. This altitude is typically reached in about 2 minutes of flight,» says Hendrik Thielemann, Head of Communications at RUAG Space. «That flight, however, is not an easy ride. Shooting up through the atmosphere, the pressure impact on the payload fairing is enormous and the temperature at the tip of the launcher easily reaches 600 centigrades.» This is why the fairings are also protected by a layer of special cork material that burns off during the flight. By burning, the flames take the heat energy away and protect the complex structural portion of the fairing.

The fairing elements are produced in air-conditioned buildings. The different layers of shell elements – i.e. the inner face sheet of composite laminates, the honeycomb core, and the outer face sheet as well as the thermal protection are laid up onto specially designed moulds. The entire set-up is then processed in a gigantic autoclave capable of curing elements of 4 meters in diameter and 6 meters in length. As one may imagine, pressure greatly varies from the launch platform to orbit. Numerous valves control the pressure and make sure the satellite remains well protected inside. «After the curing process in the autoclave, the shell elements are outfitted with the necessary inserts and interface equipment for the bespoke mission in our machining department,» explained Paul Loeliger continuing the tour. Valves, holes and doors of varying sizes to access the satellite once the fairing is mounted on the rocket, interfaces to the launch table mast and connections for on-ground payload cooling, and all sorts of wiring are added to the elements.

ADVANTAGES OF COMPOSITES OVER TRADITIONAL MATERIAL

«Building the fairings in composite sandwich technology has numerous advantages,» explains Paul Loeliger. «High-end composites not only reduce the overall weight of the payload fairing to some 2.7 tons but also allowed new attractive structural specifications combining low mass and high stiffness. The ogive shaped fairing significantly reduces the aerodynamic drag and increases the launcher's payload

capacity.» At Emmen, the fairing halves are then also painted with a special coating to prevent electrostatic charging and provide the necessary protection against solar heating until launch. «Not only heat and pressure is taken into consideration. Noise, too, is a serious issue,» says Mr. Thielemann. «The noise of the engines reflected upwards on the launch table, the atmospheric friction and the transonic phase could seriously harm a satellite. This is why acoustic elements are mounted on the inside of the fairings.»

On the rocket, the two halves are connected by means of the vertical separation system. The horizontal separation system fastens the fairings to the rocket itself. Triggered by the onboard computer at the proper flight altitude, the pyrotechnical elements of the separation systems are ignited, and the fairing halves are jettisoned. They disintegrate and fall back to earth. As Arianespace launches its rockets from the Guiana Space Centre at Kourou in French Guiana, where the proximity to the equator gives a significant advantage for the launch, the jettisoned fairings fall into the Atlantic Ocean. Upon impact, they disintegrate even more and sink to the ground, and apparently positively contribute to the local coral reef building.

«So the Gurit materials are actually only used to protect the satellites during two minutes?» SHAPE asked. «True, but they are key in providing exactly that high-performance protection,» said Paul Loeliger. «Composites technology is Rocket Science! Even the slightest material deviations matter. Using composites, we have materials at hand with unique physical characteristics that are able to handle extreme pressure, enormous spans of temperature and are at the same time very light.»

How does RUAG qualify cooperation with Gurit? «Well, we are a very demanding customer. Material characteristics are to be very precise already in aircraft technology. But space technology is many times more demanding. Deviations of a hundredth of a millimeter equal a trip around the globe in this context. We rely on suppliers who live up to these tremendous standards, and I hope that Gurit continues to supply the high quality of materials we are getting today.»



UNPARALLELED 100% MISSION SUCCESS

More than 190 payload fairings have been commissioned for European and US-American launch vehicles. To date, all RUAG Space payload fairings built in a variety of sizes and configurations have an unrivalled 100% mission success. This qualifies RUAG Space as one of the world's leading suppliers of payload fairings for launchers. Currently, fairings are produced for the European ARIANE 5, the Lockheed Martin Atlas V-500 launch vehicles and the small European launcher VEGA.

A BROADER PERSPECTIVE OF PURCHASING



Materials and services bought make up for a big portion of Gurit's cost base. «World-class» purchasing plays an essential role in Gurit's overall operations improvement scheme. SHAPE spoke with Chief Purchasing Officer Robin Price – a tell-tale name!

It's nine months since you joined Gurit as Chief Purchasing Officer. What changes have you made?

I was lucky to join a team that was already implementing many facets of good purchasing practice, so I haven't had to start from zero. The first thing I've done is to structure the way we analyse our purchasing information, and now we are able to give all the Gurit businesses a complete cost report each month and, more importantly, a cost forecast for the next 12 months. We call it the «Purchasing Radar». The next stage has been to extend our focus. Traditionally, Group Purchasing has concentrated on raw materials only. They are certainly the most important costs for us to manage, but there are also significant costs to control in other areas. I've split our whole spend into five categories, each managed by a category manager: Chemicals, Production Consumables, Reinforcements, Indirect Materials, and Services. I've just appointed Julie Lavers as category manager for services. Initially, she will concentrate on managing our expenditure on freight, but she will then move on to other areas of non-raw material spend. Each category manager is responsible for working with me to develop strategies for each commodity within their categories. We then select the right set of suppliers to help us to achieve goals within each strategy. The supply base should be dynamic. We expect constant improvement from suppliers and supplier development is something that we will emphasise more. Some suppliers will not make the grade, allowing us to introduce new suppliers. Our customers are very demanding of us, and we have to be equally demanding of our suppliers.

You've just introduced a new global purchasing policy. Why was that?

Every site spends money with suppliers. My team – currently nine of us located in the UK – manage the major share, but some non-raw material spends are too small to centralise and will continue to be run locally using the global processes outlined in the new policy. The policy sets some standards to ensure that Gurit gets best value at all the sites. The Group Purchasing team will work more closely with the sites and provide commercial expertise as necessary.

What effect does the global recession have upon your purchasing activities?

The economic climate is bad for everyone. However, we are seen as an attractive customer by our suppliers because of the good mix of industries we serve. Our target markets all promise considerable growth – if not this year, at least in the mid-term. And we are recog-

nized as materials specialists at the forefront of technology. This is something our suppliers like, and they take pride in being part of our extended team.

I think your aim is to produce a world-class purchasing organisation. Are you there yet?

We're getting better, and we look to improve even more. «World class» is always a destination on the horizon and no matter how much we improve there is always scope for further improvement. We recently sent out a questionnaire to key people within Gurit. The feedback was that we're on the right track in many areas, but there's plenty of ways for us to increase our impact on the business. Part of that will come from communication. Many people still think that purchasing is just about price. There's so much more we can do to add value to our end customers, and we will only do that by talking more to the business teams in Gurit to learn about our customers' needs, and to give feedback on what we've learned about the market from our suppliers.

What about communication «up-stream»?

Very important. The key phrases here are «reducing supply risk» and, as previously mentioned, «supplier development». We like to work as closely as possible with our suppliers. We provide them with feedback on their performance and try wherever possible to help them improve their own processes. Secure supplies and consistent quality is essential for us. Seamless supplies, multiple sourcing and accurate news flow and communication allow us to reduce our inventory levels. This gives us a benefit, but one that we balance as part of our overall management of risk. If our suppliers improve quality consistency, reduce wastage and reach higher output levels, it is good for both of us – supplier and purchaser. We have, for example, some ongoing «six-sigma» work with some of our sourcing partners, which are very promising.

So after your first nine months are you still enjoying it?

Absolutely – no question about it! Every day is different and there are the great people I work with both within our company and at our suppliers.

Gurit wurde auch in der Materialbeschaffung deutlich internationaler und kompetitiver.

固瑞特公司在原材料开发方面的成就已变得日趋国际化及具竞争力。

CATIA REDUCES DESIGN AND DEVELOPMENT TIME



Der Wechsel zur CAD-Software CATIA erleichtert die Zusammenarbeit zwischen Gurit und Autobauern.

CAD制图软件CATIA的采用，大大促进了与汽车客户之间的合作。



The Gurit Automotive team had first been using an entry-level CAD tool. They have now made the switch to CATIA. Sharing design information with OEMs using the same data format greatly facilitates cooperation.

Advising customers on composite-specific design matters for their components is a key part of Gurit's offering as a tier 1 automotive supplier. Small changes in edge condition or draft angles can have a significant impact on a composite component's manufacturability and price. Effective use of CAD, both as an analysis tool and a means of communication between design teams, underpins this process.

Once the component geometry is finalised, CAD work on tooling concepts begins. This is largely an iterative process with inputs from the customer, from Gurit engineers and the toolmaker's own design team. Historically, Gurit had worked with an easy-to-use and relatively inexpensive entry-level system as its primary 3D CAD system. «We used this system to develop the design of the production tools for the current Aston Martin DBS coupé,» says Martin Starkey, Managing Director of Gurit Automotive. Interim designs are frequently exchanged and modified by all parties prior to final design sign-off. «With time, it became obvious, that our system did not fully fulfill all the requirements for day to day tasks in the demanding automotive environment. Especially the creation of files for data exchange resulted in abnormally large files impeding cross communication between Gurit and its partners.»

COMMUNICATING IN CATIA

Two CAD systems are pre-eminent in the automotive industry: I-DEAS was largely driven by the Ford Motor Company, merged with the Unigraphics NX series of CAD systems and continues to be used at Ford and other companies. CATIA Version 4 and Version 5 have been adopted by a large number of automotive OEMs and are rapidly becoming a de facto standard for automotive design. Communicat-

ing in CATIA native file formats is a condition of becoming a tier 1 supplier for many OEMs. Gurit has therefore opted for CATIA V5. «Our system went live in November 2008 with onsite support and training in its fundamental operation,» Alan Purves, Account Engineering Design Manager remembered. Further, automotive-specific advanced training took place at the supplier in April 2009. The huge variety of CATIA modules offers scope to integrate other processes and gain further improvements in productivity, for example programming of CNC cutter paths for future projects could be accomplished from within CATIA using the Machining Workbench. A key part of the development of CATIA has been to integrate composites manufacturing and design operations, and the Composites Workbench allows ply shapes to be generated, developed and cut from within a CATIA environment.

SPEEDING UP DESIGN AND DEVELOPMENT TIME FOR ASTON MARTIN'S DBS VOLANTE

After completion of the basic training course, B-surface tool design work was undertaken for Gurit's involvement in the Aston Martin DBS Volante project, and the value of the investment in CATIA and associated training rapidly became clear: Using the former 3D package for the DBS Coupé had taken approximately 50 man hours. Using CATIA V5, a similar task for DBS Volante took just nine man hours. Tool design for the DBS Volante model represented a significant progression for Gurit as the global leading carbon fibre parts supplier. «Through further development across all our processes and deployment of powerful tools such as CATIA, the time taken from design freeze to parts production has effectively been halved,» concluded Martin Starkey.

CROSSING OVER TO COPENHAGEN'S OPERA NOW SAVES 50% ENERGY

The new Opera House offering spectacular views over the Renaissance city is a prime attraction of Copenhagen. Opera goers, tourists and residents crossing the harbour from Nyhavn now embark on a passenger and bicycle ferry built with Gurit composite materials. With displacement halved at constant waterline length, Arriva 3 not only features a very short build time and low maintenance costs but also saves approximately 50% of fuel compared with traditional vessels.



Die aus Verbundwerkstoffen gebaute neue Fähre verkehrt in Kopenhagen zwischen Nyhavn und dem Opernhaus und braucht dafür 50% weniger Treibstoff.

往返于新港Nyhavn和哥本哈根歌剧院的新渡轮，是用复合材料建成的，建成后的渡轮节约燃料超过50%。

The Baltec Shipyard in Lübeck, Germany, is specializing in building high-strength, fuel-efficient vessels using advanced composite materials. Baltec and SP, the marine business of Gurit, have been working together for several years. Having used SP's engineering and materials successfully in previous projects, Baltec drew again on our expertise for its latest project, a monohull double-ender passenger ferryboat for inland waterways. The Arriva 3 ferry is specifically designed for quick to-and-fro service for up to 100 passengers and bicycles between Nyhavn and the Opera House. The crossing to the spectacular theatre building inaugurated in 2000 offering sweeping views of Renaissance Copenhagen only takes five minutes.

IMPRESSIVE FUEL SAVINGS

Arriva 3 was constructed with reliable materials certified for a light-weight composite design and build, allowing a significant reduction of the overall weight while ensuring most demanding performance criteria. Halving the ship's displacement at constant waterline length reduced the necessary engine input also by half. As a consequence, Arriva 3 only consumes about 50% of the fuel similar vessels built in aluminium would typically use. And, in addition to remaining strong and robust, the tough epoxy surface of Arriva 3 keeps regular maintenance costs at a low.

COMPLYING WITH MOST DEMANDING FIRE RESISTANCE REQUIREMENTS

Baltec chose SP's ST 70FR Fire Retardant SPRINT® E-Glass prepreg materials for all sandwich panel laminates for this commercial craft that meets the most stringent industry standards: ST 70FR, part of our SPRINT® product range, not only passed the complex German fire

resistance standard DIN4102/B1 in a recent SP build, the same resin system was also passed by Baltec through the International Maritime Organisation (IMO) FTP Code part 5 requirements in conjunction with a fire retardant (intumescent) coating for the construction of Arriva 3. The ST 70FR-BL SPRINT® system proved vital for Baltec's overall process control and the production of large composite panels of approximately 30m² each.

SIGNIFICANTLY LOWER BUILD TIMES

Baltec's fillet joint bonding solution—a technique comparable to welding steel plates together—uses a combination of two SP adhesive systems. A fillet bondline of Spabond 340 was applied to join the sandwich panels. This structural adhesive features high strength and sag resistance qualities which are fundamental to this part of the process. Spabond 540PB was used to bond stainless steel and composite parts together; its high elongation at break is a necessary property to cope with the diverse thermal movement characteristics of the different materials combined. Spabond 340LV was applied for gluing all panels, stringers, bulkheads, longitudinals, transversals and deck parts together. Using a special mixing and dispensing machine made it possible to apply the adhesive at the same time as forming the fillet—a much faster method in comparison with metal-welding.

SIX MONTHS FROM KEELPLATE TO FULL FINISH

Arriva 3 is a fitting example to demonstrate that using adhesive welding can result in a short build time of just six months for a small team of 8 and 12 people. Starting in February, the SP and Baltec shipyard teams finished the build of this 32.7m x 7m ferry well in time for its operation in the Port of Copenhagen beginning in August 2009.

According to Baltec, an aluminium construction needs four times more stringers than a composite sandwich construction. Considering that aluminium welding of 1m takes about three times longer than composite bonding, approximately 400 additional hours are required to build a comparable vessel in aluminium. The table illustrates the time savings for one of Baltec's previous ship designs.

While this calculation highlights the considerable time savings, it does not even take into account the additional isolation process required for all aluminium outer shell surfaces. Composite sandwich constructions are by definition self-isolating. Time in maintenance using adhesive welding is another huge time saver.

| | Adhesive welding | Aluminium welding |
|-------------------------------------------------|------------------|-------------------|
| Preparation of single parts/cutting and kitting | 10% | 10% |
| Part positioning and adjusting | 20% | 20% |
| Welding of hull panels | 10% | 30% |
| Welding of bulkheads/stringers | 10% | 75% |
| Use of positioning equipment | 20% | 20% |
| Finish | 30% | 30% |
| TOTAL | 100% | 185% |

KEEP THEM TURNING

Wind energy is still a relatively juvenile industry. Wind turbines are not only erected anew, they also need regular maintenance work to keep them turning. What is more, the ones installed in the 1980s are slowly aging. This opens the door for an ever more specialized after-market service industry. Gurit has a special product offering targeting the composite needs of this growing market.

Imagine a car driving at 260 km/h for about 20 years along a wind-battered sea shore. What would that car possibly look like? The tips of wind turbine blades cut at about that speed through the air and are designed to last 20 years. Twenty years is commonly believed to be the average life expectancy of a wind turbine on land, off-shore it will probably be more like 25 years as winds are less turbulent there.

TYPICAL BLADE REPAIR WORK

The blade production market is characterised by rapid technical advances, global blade manufacturing/assembly sites, new entrants and the fast introduction of new larger blades. These market trends, combined with environmental considerations, inevitably lead to blade repairs which fall into three categories:

1. Manufacturing issues

- a. Fibre waviness and laminate overlaps
- b. Bad bonds, delaminations and voids
- c. Quality issues that relate to a batch of blades; resin/adhesive issues or errors in blade processing

2. Transport damage

- a. Damage on the trailing edge due to movement of the transport securing straps
- b. Accidental damage from transport/installation; damage caused by fork lifts or cranes.

3. Environmental damage

- a. Leading edge erosion
- b. Trailing edge splits
- c. Lightning strikes – Scorching and blade tip splits

The most common repairs are related to lightning strikes. Wind turbines are designed to take lightning strikes and are typically protected by a strong copper wire surfacing at regular intervals in the blade and especially at the tip of the blade where lightning strikes occur most frequently. If a lightning bolt is too big to be absorbed by the rod, the excess heat at the point of entry bursts the composite surrounding the copper wire.

Blade damage is not easy to detect; often it is a change in the sound from one of the blades that signals a change in its aerodynamics. Composite specialists then clean out the damaged section and lay down new layers of fibre fabric, resin and gelcoats for smooth surface – not unlike repairing the hull of a boat, except for the fact that this work is usually done in airy heights.

Regular servicing of blades is a key element in reducing downtime and gaining the optimum power output from the wind turbine generator. As an example, Wind Energy Services in the US claim that leading edge erosion on blades can result in a 5%–10% power loss per blade.

THE ADVENT OF A GROWING SERVICE INDUSTRY

Within the last 10 years, the installed wind energy capacity rose from about 7 GW worldwide to well over 120 GW today. All these turbines need to be serviced. Service costs certainly depend on the location, on the type of turbine, on its age and size. It is fair to expect maintenance costs to rise along with the age of the equipment. At the same

time, service costs form a smaller percentage of the overall costs as the average size of wind turbines rise. The European Wind Energy Association cites that 1.2 to 1.5 eurocents per kWh of wind power produced over the total lifetime of a turbine can be attributed to operation and maintenance. Similar figures have been produced by the Danish Wind Industry Association who state that the yearly maintenance costs are typically 1.5% to 2% of original installed wind turbine generator cost. For a 1.5 MW wind turbine, costing Euro 1.2 M, this equates to Euro 24,000/year.

Blade repairs are typically performed by the Wind Turbine Generator OEMs or the blade builders in the warranty period. The warranty period is typically 2–5 years depending on customer, and most blade repairs during this period involve using the original blade materials and repair procedures defined by the OEMs.

Outside the warranty period the blade repairs become the responsibility of the wind farm operator and the repairs can involve the use of materials that were not originally used in the blade build and the repairs can be performed by sub contract repair companies.

Several industry surveys have studied the outlook of the wind energy after market recently: With the aging of wind farms, they conclude, the opportunity for after-market service providers is bound to grow. Currently, the global wind turbine maintenance, repair and overhaul service market is estimated to grow from USD 3.9 billion today to over USD 9 billion by 2013, including work done on wind turbine blades, generators, gear boxes and other turbine components. This equates to an 18% annual growth rate. With easily over 20% increase per year, industry analysts expect to see the biggest growth in North America and China where the wind energy capacity is believed to



grow above average in the next five years, while this market is expected to grow at some 14% in Europe. Currently, maintenance, repair and complete overhaul and replacement costs contribute between 20 to 25% of expenditures in the global wind turbine market, research papers say.

With the wide range of wind energy participants ranging from large power utility, to manufacturers and niche players, the industry specialists reckon that there is a true need for a structured and reliable service business model to meet the needs of this after-market. Up to today, the after-market has been dominated by the Original Equipment Manufacturers. As the market matures and the demand for specialized after-market services outgrows the existing capacity, independent third-party service providers are expected to fill this rising demand gap. Gurit is ready to supply them with a comprehensive composite blade repair system.

TARGETED MARKET APPROACH IN THE US

Gurit and Composites One have joined together to offer a specially developed range of blade repair materials for the North American Wind Energy market. These competitively priced products are specifically designed for repair, possess the appropriate approval by GL and/or OEMs, and are available to all developed wind resource states in the US at very short lead times. Alongside this specifically designed service, Composites One and Gurit are also launching a product selection guide that will detail the range of materials used to repair the most commonly found damage to in service blades. The guide contains detailed guides to repairing infield blades, as well as recommended materials. Compiled by Gurit and Composites One, the guide is based upon the combined experience of the two companies who have supplied materials and technology into the wind energy market for 15 years.

GURIT WIND TURBINE BLADE REPAIR SYSTEMS

| Category | Product | Description | Mix ratio resin:hardener (by volume) | Application | Availability |
|----------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------|
| Wet Laminating | Ampreg 21 | Low viscosity wet laminating system with range of hardener speeds | 100:38 | Structural repairs to blade shells | Small 1.33kg packs up to 1000 kg IBCs |
| Infusion | PRIME 20LV | Low viscosity infusion system with good cure progression & high toughness at ambient only cure. Range of hardener speeds | 100:31 | Structural repairs to blade shells & injection into voids | 3.9 kg packs to 1000 kg IBC |
| Adhesives | Spabond 340LV | High strength & toughness structural adhesive with range of hardener speeds | 100:50 | Trailing edge splits damage due to lightning strikes, delaminations & bad bonds | 400ml cartridges up to 200kg drums |
| | Spabond 730 | Fast curing structural adhesive. Gels in 10 minutes, solid in 2 hours & full properties achieved overnight | 100:100 | Small repairs/splits on trailing edge sections | 400ml cartridges |
| Fillers | 15 Min Spot filler | Fast curing spot filler | 100:100 | Filling & fairing of leading edge and defects on blade surface | 1kg resin & hardener up to 24kg resin + 24kg hardener. |
| Gelcoat | SP8682 with SP7856 hardener & SP7857 accelerator | 3 component UV stable Epoxy Gelcoat | 100:37.7 up to 3.5 | Repair of topcoat used on prepreg blades produced by Vestas & Gamesa | 1.6kg packs |

Gurit produces a range of products for blade repairs. These products have been used by a number of Wind Turbine Generator OEMs for original blade builds but are supplied in small, more user friendly packs for in-field blade repairs. The range of repair materials offered by Gurit are suitable for both structural and blade surface repairs on epoxy infused and prepreg blades.

Die Wartung von Windturbinen ist ein wachsender Markt, den Gurit mit einem speziellen Produktpaket gezielt angeht.

对风力涡轮机的维护是一个朝阳的行业，固瑞特公司致力于该项特别材料的研发。

STICKING TO STRATEGIC PRIORITIES



2009 is a year of global recession. Recovery comes slower and more gradually than anticipated. SHAPE wanted to know from CEO Rudolf Hadorn how Gurit was coping with the current challenges.

What does Gurit need most in challenging times like these?

Three things, I would say: A clear strategic goal, discipline in execution, besides, of course, the financial means to safely stay in business. Let me put that into perspective: Some of our customers witness rather substantial sales reductions this year versus 2008. And this clearly affects Gurit, too. Yet, while we are suffering from lower sales and declining capacity utilizations, we adjust our cost base as best as we can to protect our profitability and the solidity of our balance sheet. And we stay focused on the implementation of our long-term strategy.

What about Gurit's capacity utilization?

Two years ago, Gurit invested into the global expansion of its production capabilities – based on the growth projections expected for the coming years at that time. Last year, our production capacities were not fully loaded. In the first half of 2009, sales to our target markets declined by 12% based on constant currency translation rates. While the situation in our European works is just about satisfactory, the loading of our prepreg works in Canada is disappointing, and in China we also have considerable reserves in prepreg, while we are full in our foam expansion and kitting activities. While we believe that the idle capacity will be beneficial in the next upturn, the task now is to use the low capacity utilization for retrofit programs, targeted machinery upgrades and for additional employee training. We want to be in the best shape possible when markets recover.

Where exactly is Gurit investing right now?

We have just about doubled our foam kitting capability in China with the purchase of two new 5-axis routers to kit Corecell foam this fall. And in Europe, we have launched a targeted retrofit program for our prepreg machines. 2009 will not see massive capital expenditures, but wisely targeted and effective investments in line with our long-term strategy.

What are the major strategic objectives?

For the whole Gurit Group, we certainly want to be in the best shape and ready for the next upswing. Therefore we continue to invest in our product development and aim to expand our addressable markets. Looking at the various target markets, our strategy can be summarized as follows: In Wind Energy, we want to be recognized as the leading materials and technology partner for all wind rotor blades manufacturing technologies. We have considerably strengthened our Wind Energy marketing and sales force for North America and

the Nordic countries in Europe. Apart from prepreg we are thus also strengthening our presence in formulated products and especially in core products. The acquisition of a majority stake in the company China Techno Foam in Tsingdao also has to be seen in that context: We want to extend our foam presence in China with locally sourced, locally produced core materials for the Chinese market. Moving our production as close as possible to our customers is another strategic thrust. As China will be one of the major growth markets for Wind Energy, we are also installing some of our capacities for resin formulation at Gurit (Tianjin).

In Transportation, we want to maintain our leadership position in aircraft interiors materials in Europe and leverage this know-how into other interesting markets such as Rail. We are again supplying materials for a next generation of high-speed trains in China. Last but not least, we want to bring our Automotive business up to a next level. In the second half of this year we will start supplying Class-A carbon car body parts to a second premium car maker. We hope to turn the broad interest we see in the market for this technology into real sales figures when the economy picks up again.

In Marine – a very difficult market for the time being – we work hard and successfully on expanding our customer base. We have expanded our marketing efforts especially in the Nordic and the Mediterranean boat market with Italy being a special focal point. In addition, we want to penetrate that market deeper with newly developed materials such as M-Foam and comprehensive materials and technology packages for high-end production boat builders. The new contract with Nautor/Swan is an important step in that direction.

Klar auf die mittelfristige Strategie ausgerichtet, meistert Gurit die Herausforderungen der Rezession.

采访Hadorn 以中期战略为重点，固瑞特公司迎接并对抗全球经济衰退的挑战。



M-FOAM – THE FOAM FOR ALL MARINE APPLICATIONS

Gurit has launched M-Foam, a new structural foam that combines the product characteristics most important in marine applications into one single material.

Since the SAN chemistry-based structural foam family Corecell was first introduced to the marine industry, it has developed a reputation for toughness and reliable processing. The A and P grade Corecell foams have been used on many successful marine projects ranging from production boats to superyachts and one-off racers such as Volvo 70's and Open 60's. Due to the property of very high shear elongation, Corecell was so far predominantly used for slamming areas, while the static properties had limited potential applications compared with PVC foam.

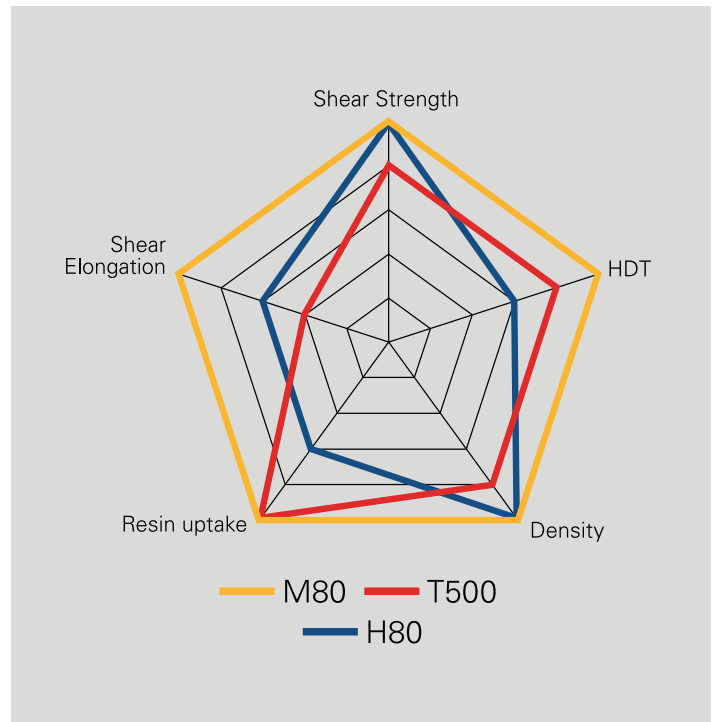
FROM MARKET ANALYSIS TO THE PRODUCT BRIEF AND THE FINAL PRODUCT

Gurit's market analysis showed that there was an opportunity to consolidate Corecell's leading position in the marine market by developing a new product that gave optimal properties in both dynamic and static situations, was equally compatible with prepreg and infusion processes, and retained the benefits of existing Corecell products with low resin uptake, no out-gassing and robust processing. In other words, we wanted to create a single new structural foam with superb material characteristics for any kind of marine application.

A Product Development brief was written by Product Management in liaison with our SP marine specialists using the feedback of customers and the input of Gurit's technical team, setting clear targets for each property required, and referring to competitor benchmarks. The development project team included specialists from various Gurit sites: Yan Simard, MFG Chemical Engineer at Gurit (Canada) in Magog, was the project manager. He was supported by a team consisting of Alain Leclair, R&D and Quality Manager at Gurit (Canada), Joe Summers, Product Management, and Julien Sellier, Project Engineer, who both work out of Gurit (UK) in Newport, and two additional Canadian colleagues, Miguel Turcotte, Laboratory Composites Technician, and Kurtis Duddy, Composite Processing.

VALUABLE INPUT FROM STRUCTURAL ENGINEERING

Regular meetings were held with the other team members acting as consultants. A key contribution to the project was Gurit's engineering capability. Structural Engineers were instrumental in defining what mechanical properties were necessary to achieve sufficient strength. Julien Sellier made several benchmark models available, based on



A comparative analysis of important materials characteristics shows that M-Foam M80 (yellow line) scores highest compared with other core materials.

as-built marine structures, typical for sandwich panel applications, allowing rapid feedback on how M-Foam performed against the other products of our own Corecell range, as well as the competitors' products. The main criterion used for these studies was to match the original design strength and highlight weight saving due to the use of M-Foam. Models used were:

- **Hull laminate** for 40', 60', 100' and 130' yachts. The foam of the sandwich panel is subject to high core shear loads. Also the foam stiffness will have an effect on the skin wrinkling capability of the sandwich laminate (local instability of the skins in sandwich panels).
- **Deck laminate** for 40', 60', 100' and 130' yachts. The foam stiffness (compressive modulus and shear modulus) are critical for the buckling stability of the sandwich panel under compressive loads. Core shear strength is also important in that case to ensure the water loadings can be withstood.

INCREASED CORE SHEAR STRENGTH

Marine foams are very specific as they need a compromise between their ability to withstand dynamic loads (slamming on hull panels) and high static loads (compression in the deck in the case of a sailing yacht). In terms of mechanical properties, impact resistance is largely driven by the shear elongation. M-Foam, being based on a similar chemistry as the A and P grade, inherited the high shear elongation characteristics of those market leading products. M-Foam's major improvement lies in the increased core shear strength combined with an overall lower density range.

The M-Foam project was started in earnest at the beginning of 2009. The final product was launched on July 17, 2009, with a preceding teaser and information campaign. Sharing the general Corecell benefits, Corecell M-Foam is the only core material available to offer a complete cost-effective package comprising high shear strength, low weight and high elongation, low resin uptake for infusion processes

and high temperature stability for prepreg processes. Easy to machine, the fine cell size and tough M-Foam offers a superior uniformity through lower density variation and is compatible with polyester, vinylester and epoxy resin systems. In addition, Corecell's unique «knife-cuts» ensure very low resin absorption and thus save both weight and cost. For additional technical information, please consult the section on Corecell Core Materials in the Marine section of the Gurit website www.gurit.com.

Initial feedback from the market has been very positive, and the most important aspect of any launch, sales, are expected to follow.

Mit M-Foam hat Gurit einen Strukturschaumstoff geschaffen, der im Bootsbau alle wesentlichen Anforderungen in einem Material vereint.

固瑞特研制出一种新的产品M-发泡，在一种单一材料中将航海领域中最重要特性结合起来。

SP beliefert Nautor in den nächsten Jahren mit einem umfassenden Produkt- und Engineering-Paket.

在今后的几年，SP会为Nautor公司提供全面的产品及技术服务。

TURN-KEY MATERIALS AND SERVICES PACKAGE



SP has gained a three-year exclusive supply agreement with Nautor who builds the world renowned Swan range of sail boats ranging from 40 – 130 feet. All newly designed Swans will be built in Gurit's patented SPRINT® technology, Corecell structural foam core, and Spabond structural adhesives. SP will also be contracted for the structural engineering for all future boats.

Nautor has a long and illustrious history as a quality production boat builder that specialises in performance driven, ocean-going, luxury sailing yachts. Although Nautor has been a very valuable customer to SP for well over a decade, they have in the past utilised various manufacturing methods with non-SP products. The last eight years has seen the Finnish company expand their manufacturing techniques and push boundaries with the use of SP's materials and technology.

As a result, the most sophisticated Nautor yachts produced to date will be launched later this year – the full SPRINT® carbon epoxy high performance Swan 60 and 80. Paul Riley, Marine Sales Account Manager, explains how Nautor and SP have shared a close working partnership and forged significant technical developments throughout the project. «Nautor was the first marine company to adopt SPRINT® technology in the production of a large structure and this was applied in the manufacture of the Swan 45 and 601 ranges. The lightweight decks on this full bred racer cruiser provided practical production experience for SP and allowed the SPRINT® range to be refined to increase robustness, and flexibility in fabric and resin selection. The 45's production process also initiated the introduction of tack films for work on vertical surfaces. In turn, Nautor's commitment to the project has seen the company make considerable investment in new production facilities, including a 100 foot computer controlled curing oven which facilitates precise temperature control throughout the curing process,» Paul Riley explained. On completion, the Swan 45 performed beautifully and consistently achieved good results on the race course.

PRODUCTION BOATS BUILT LIKE ONE-OFF YACHTS

Nautor was obviously keen to capitalise on the successful performance of this first SPRINT® production boat, and the concept of the Nautor 601 was born and latterly the new 60 and 80. The design house of German Frers and the engineering expertise of SP's structural engineering team were called upon with the aim of producing a superior performance yacht, normally only associated with custom one-off builds, yet produced as a series production boat. From a production perspective, the vessel must be uncomplicated to construct without compromising the values Nautor customers expect: superior quality of interior comfort and stylish fit-out, all combined with impressive racing performance. This brief called for the use of state-of-the-art materials, innovative manufacturing processes, combined with an intelligent approach to engineering.

PRODUCTION PROCESSING

With the one-design concept, every aspect of the build of the boat must be repeatable. SPRINT® with its fixed resin content, fibre weights and pre-catalysed resin systems means accurate weight and lami-

nate thickness can be produced consistently in a simple process with the opportunity for error removed. A prototype was not produced for the Swan 60 project, so each boat in the series, including the first, had to be exact and delivered at the correct weight with no margin for error as future modifications could not be made.

With a team of eight men, the inner skin of the 60 was then laid. This whole process took only three and a half days before applying the vacuum bag and curing – an extremely rapid laminating time by ordinary standards. The inclusion of extra resin within the SPRINT® material to facilitate core bonding resulted in further time-savings in what would normally be a very time consuming process of priming the core, or the use of glue films, on either side of the core material. Not only was the procedure extremely time-efficient but it was also very clean, completely eradicating the need for any wet systems and the associated drawbacks. Good standards and continuous improvement of Health and Safety practices are a very important issue for Nautor who continuously strives to improve the environment for its operators.

All the internal structure, bulkheads, transverse, longitudinal beams, keel box and engine mounting structure were produced separately in female moulds. The Swan 60's bulkheads and internal frames are constructed with flanges so they can be sited and bonded into place with high strength structural adhesives – again minimising wet laminating processes and reducing man-hours and labour costs considerably. On SP's technical team's recommendation, the structure was bonded into the hull using a combination of SP's Spabond 345, 340LV and 130 adhesives.

RELIABLE AND PREDICTABLE MATERIAL

Working with SPRINT® and female moulds also means the laminate thickness is extremely predictable and repeatable. This combined with a consistent surface finish allows certain tolerances to be achieved, enabling the secondary bonding of the internal structure to be a relatively simple process. The need to compensate for miscalculations that can result in the filling of large gaps or cutting of laminates is also removed.

«Once we became familiar with the process, SPRINT® has proven to be a reliable and predictable material, as well as saving valuable man-hours. It also enables you to accurately predict final weights and properties of laminates which makes boatbuilding much easier.» Mr Kjell Vesto, Nautor's Technical Director commented, «We are able to repeatedly produce laminates with very low void contents, correct fibre to resin ratios and predict mechanical properties – exactly what a reputable boat builder needs!»

Being Gurit

GURIT WEBSITE NOW AVAILABLE IN CHINESE

In order to enhance and develop our business in China, Gurit has created a dedicated Chinese website www.gurit.cn. Being already a prime Wind Energy market for Gurit, China also offers great opportunities for our Transportation and Marine products. The website was launched in time to support Gurit's presence at China Composites in September 2009. The Chinese website is a condensed version of the main website summarizing all current, existing materials and information. The [gurit.cn](http://www.gurit.cn) website covers all main market areas and associated products including Wind Energy, Aerospace, Rail, Automotive and Marine. The website has been fully translated into Chinese and will further enhance and strengthen our customer base and product offering.



GURIT IR WEBSITE CONTENT RANKS 25TH OUT OF 500

The websites of all Swiss companies listed on SIX Swiss Exchange are annually being analysed in terms of investor relevant content. Since 2007, the communication bachelor students of HWZ, the Zürich University of Applied Sciences, have rated the websites of the publicly listed companies using a pre-defined list of criteria. Gurit ended ex aequo on rank 25 together with Allreal, Baloise, Comet, Logitech and Swisscom. The 10 best rated websites were analyzed a second time by an independent jury consisting of analysts, financial on-line journalists, on-line specialists and faculty. Georg Fischer's website scored highest, followed by Credit Suisse and Roche.

| | |
|----|----------------------------------------------------------------------|
| 22 | www.charles-voegele.com |
| 22 | www.llb.li |
| 22 | www.sgkb.ch |
| 25 | www.allreal.ch |
| 25 | www.baloise.com |
| 25 | www.comet.ch |
| 25 | www.gurit.com |
| 25 | www.logitech.com |
| 25 | www.swisscom.com |
| 31 | www.abb.com |
| 31 | www.adecco.com |
| 31 | www.feintool.ch |

GET ON YOUR BIKES!

Gurit (UK) has various initiatives to keep employees in shape: the onsite gym is used by many colleagues over lunch-time and after work. Others keep fit swimming at Gurnard Pines, the local leisure club. The easiest available daily fitness training, however, is to ride the bike to work. «Gurit not only linked its site to the public cycle path



network on the Isle of Wight, we also have special bicycle offers for our employees,» says John Frogatt who eagerly advocates the «Get on your bikes» initiative or the car sharing scheme to relieve some space in the car park. «We offer a great selection of bikes at a considerable discount.» Working together with a local bicycle and sports shop, Avocet Sports, Gurit can provide its employees – and families – with cycles at some 30% discounts. Some 30 bicycles have already been sold in the context of this programme. SHAPE spoke with Warwick Lauder, Design Engineer, who recently got an 18-speed mountain bike through the «Get on your bikes» plan. «I think it is a great initiative, promoting true green transportation to and from Gurit, and I would like to congratulate John on that brilliant idea. It certainly got me on my bike. I live about 4 miles from Gurit, accessible by the lovely bike path that runs beside the Medina River. This is really a very nice ride to work.» And Warwick does not limit his bicycle ride to nice and sunny days. «This summer I have been riding to work really every day along that bike path. The shower and gym facilities at Gurit (UK) allow you to ride into work – whatever weather condition. I usually hit the gym when I get to Gurit in the morning anyway, then refresh myself before I start my working day.»

Die Gurit Website ist nun auch auf Chinesisch aufgeschaltet. Preislich attraktive Fahrräder überzeugen immer mehr Gurit-Mitarbeitende zur Arbeit zu radeln.
固瑞特网站已经开通了中文。



THE GURIT CODE OF CONDUCT

Apart from hard facts and financial information, topics like Corporate Governance, Social Responsibility and Business Ethics increasingly become investment criteria and areas of general interest. The Board and Management of Gurit have signed off on the Gurit Code of Conduct – a comprehensive Guide of business principles applicable throughout the Group.

The core activities of Gurit today were formed both organically and by a series of acquisitions over the last decade. Growing into a single organization, we developed a set of values, called «Values4Success» and discussed in earlier editions of SHAPE. They are based on a mutual understanding of our personal values such as trust, respect, honesty, loyalty and integrity. The «Values4Success» provide a framework to guide our daily actions and the way we respond to difficult decisions.

- Customers – our priority
- Renewal through innovation
- Profit through empowerment
- Success through people

IN ACCORDANCE WITH THE LAW

While we conduct business within the framework of «Values4Success», our business conduct also must be strictly in accordance with national and international law and many additional rules and regulations. As the social and economic environment is changing at an ever faster pace, we want to uphold the strengths of Gurit. Establishing clear guidelines which integrate our continuously growing set of standards is an essential step in that direction. The Gurit Code of Conduct sets out those same standards of conduct that our employees have always applied using good common sense and is designed to help deal with ethical and legal compliance in our day-to-day work and applies to the entire Gurit Group. We will therefore ask senior Gurit staff to study and sign the Gurit Code of Conduct and share and discuss this Code with all colleagues.

SHARED, DISCUSSED AND PUBLICLY MADE AVAILABLE

The Gurit Code of Conduct is not only shared and regularly discussed with each and every employee in the context of the yearly appraisals, but also made publicly available on our website www.gurit.com. Special chapters are dedicated to our full compliance with the law, our information procedures, our environment, health and safety policy, our business ethics rules, our employee and customer relations policies and – last but not least – compliance.

Gurit is determined to adhere to the Gurit Code of Conduct and expects all employees – and where applicable also all external parties we work with – to fully comply with the Code.

Der Gurit Code of Conduct vereint die für Gurit und alle Gurit-Mitarbeitenden relevanten Verhaltensgrundsätze in einem einheitlichen Dokument.

行为守则：固瑞特公司的行为守则通过一本手册整合了所有组织相关的准则、标准及员工行为规范。

GURIT AGENDA 2009/2010

Gurit will showcase its wide range of material packages, solutions and technologies at a trade show near you.

The Gurit teams look forward to meeting you and introducing you to the latest in advanced composites at the following shows:

- » **3rd International Tidal Energy Summit 2009, London**
10 – 11 November 2009
- » **METS 2009, Amsterdam**
17 – 19 November 2009
- » **JEC Composites Show, Paris**
13 – 15 April 2010



Schaffhauserstrasse 339
CH - 8050 Zürich/Oerlikon
Switzerland
www.gurit.com