Dear Reader,

In 2008, Gurit successfully managed the challenge of maintaining strong business growth while re-establishing business profitability. The balance sheet was significantly strengthened and we reached a net cash position by year-end, maintaining a solid equity ratio at the same time. These achievements are pivotal in mastering the demanding year ahead.

Gurit customers, supplying partners, our entire staff and stakeholders, all supported these achievements. Please accept our thanks for all the support, encouragement and the successful work.

Looking at the conditions in our target markets for 2009, the financial market issues affect our customers’ project financing and leveraging, the sharp drop in non-renewable energy prices and the short-term uncertainty about the general business outlook are equally troubling news as they impact the market development and earnings situation of all market participants.

A little over a year ago, these issues were of hardly any concern to most decision makers. Although the coming quarters may be painful and difficult, at Gurit, we believe that the mid- and long-term fundamentals of our target markets are intact. There is no viable alternative to renewable energy generation in order to overcome dependency on finite fossil energy. Besides composites, there is no sensible light-weight and high performance materials alternative for transportation and marine applications. We therefore look ahead with optimism knowing that we’re well-positioned to tackle short-term challenges that arise in the difficult market environment.

At Gurit, we have put this year under the motto «Performance, Innovation and Passion». Operational performance progress will lead to even higher competitiveness in all we do and will provide our customers with best value for money. Innovation is key to turn new ideas into products. Passion we need to maintain our enthusiasm in all we do, despite tough times.

This edition of SHAPE will show you how our motto forms part of Gurit’s identity. You’ll discover how our materials and our engineering solutions help customers achieve optimized performance in a broad array of activities. And you’ll learn a new what novel materials Gurit has in store to tackle next-generation applications, in aerospace for example. But most importantly, you’ll find out about our passion for what we do and what we can do together.

Come see us at JEC, our industry’s most important trade show in Paris in late March, or at any of the other exhibitions throughout the year. We look forward to pass on to you our spirit of Performance, Innovation and Passion.

Sincerely,

Rudolf Hadorn, CEO
Corporate News  04 Gurit Management Meeting in the Alps.  04 Greener mobility management.  05 Guritnet is alive  05 Meet us at JEC.  06 An interview with Rudolf Gerber, General Manager Wind Energy.  22 Safety first.  Being Gurit  05 Charity donations and sporting triumphs at Gurit (Magog)  20 Training and helping the next generation of professionals.  23 Supporting a students’ eco-boat project

Corporate News

Gurit supports greener transport

Gurit not only manufactures smart materials that help generate renewable energy or reduce weight to make transportation more ecological. We also strive to act as environmentally minded as possible in operations and services. To help reduce its carbon footprint, Gurit (UK) has implemented a number of transport related schemes. Car sharing is encouraged for people who have similar routes to work as is the use of bicycles. The number of parking spaces at Gurit (UK) is limited and will remain so. So with more people willing to share a ride – and of course divide fuel costs between them – everyone has a better chance to find a parking space.

As part of the commitment to greener and alternative transport, Gurit operates two minibuses for employees who live on the mainland. The buses run between the ferry terminal at Cowes and Gurit (UK) in Newport. This non-stop bus service is typically full to almost the last seat as its schedule matches the ferry timetable.

To invite more people to cycle to work, Gurit invested into an additional link to the local cycle route last year. The new Gurit cycle route is part of the Isle of Wight’s cycle network and has reduced journey times for many of our staff. Also during 2008 a decision was taken to improve the environmental performance of the car fleet operated at Gurit (UK) by updating to new Toyota Prius petrol/electric hybrid cars. These cars are five star safety rated in the European New Car Assessment Programme, carry five people in comfort, will run at 3.5 litres per 100km and only emit 104g/km of carbon dioxide and last but not least operate with a lower UK road tax per year.

Gurit Annual Management Meeting

The Board of Directors, the Executive Team and some 50 line and functional managers of Gurit met in late January for two days in Engelberg, Switzerland, to assess and discuss the major achievements of 2008 and the challenges of 2009. With a double-digit sales growth in its target markets and an EBIT margin exceeding Gurit’s targeted 4%, the financial results prove that Gurit is successfully rebuilding a sustainable base for profitable growth. The targets for 2009, however, are demanding, especially given the global economic uncertainties. «Having had a chance to get a first-hand update also on the business activities that do not form part of my daily work, I am encouraged and proud to work for Gurit», one participant put it. «I feel we are ready for the next steps.»

After a full day of plenary presentations and discussions, the participants were invited on an early evening snow shoe tour – new kinds of steps especially for those who joined from Asia or Down-Under, but with the experienced help of their Canadian and Swiss colleagues, they learned fast. Warmed up after ploughing through waist-deep snow, a traditional Swiss fondue dinner was served inside an igloo where a final shot or two of kirsch convinced almost each and everyone to sleigh through the icy night down to the valley.


一月，在瑞士阿尔卑斯召开了经理级会议。固瑞特（英国）公司投资了一项绿色环保车队业务。固瑞特企业内部互连联网正式投入使用。
GURITNET – GURIT’S NEW GLOBAL INTRANET NOW LAUNCHED

On 16th January 2009, Gurit launched its new global intranet across all Gurit sites and locations. Guritnet was developed and designed to improve and enhance internal communication by creating one common information source that was accessible to all Gurit staff across all sites. Connecting all locations and staff, Guritnet is an interactive and effective communication tool; providing all staff with a wide range of information that is relevant to them. Within the site they can access a range of relevant material and features including:

- Global corporate and internal news
- All datasheets and brochures
- A complete image, presentation and video library
- A global staff directory with contact details
- An extensive composites events calendar
- Private Account Management systems for large Wind Sales accounts
- A technical intranet to enhance interaction and innovation within the Gurit technical community

Guritnet is constantly updated with new and relevant information on a regular basis so that employees are kept up to date with all the latest news and information. Feedback so far has been well received, and we will continue to improve, enhance and develop Guritnet to continue to meet the needs of the organisation.

JEC 2009

Gurit will be exhibiting at JEC 2009 from 24-26th March, Stand K44. JEC is the largest composites trade show within the industry and is held every year in Porte de Versailles, Paris.

The focus of the stand will be based around Wind Energy. Rotating prototypes of Infused and Prepreg Blades will create the centre exhibit of the stand to highlight Gurit’s unique capabilities in blade structural engineering, blade manufacturing and a leading products portfolio for Infused and Prepreg blades. Alongside this focus, Gurit will also showcase the 2009 product portfolio for all other market areas and launch its new market interest in Ocean Energy.

OF THE MAGOG REGION

The employees of Gurit Canada in Magog recently collected $10,070 for charity. This sum will be donated to Centraide (The United Way), a charitable organization helping those in need. The company backed the employees’ contribution with its own of $5,000. Solicitors volunteered two hours each of the campaign’s five days to approach their colleagues for donations. For a second year in a row, the 2008 team of Gurit fund raisors were: Vicky Turcotte, Director of Human Resources, Frank Rondeau, Union President for the Prepreg Unit, Bertrand Desroberts, Karine Guénette, Claudia Gilbert, Louise Veilleux, Francine Goyer and Stéphan Dancause, Union President for the Core-cell Unit. A beautiful gesture of generosity and solidarity.

TEAM GURIT TRIUMPHS AT THE MULTI-SPORT TOURNAMENT

The team from Gurit took home the honors at the sixth Industrial Multi-Sport STA Tournament held August 17. The tournament is a sports competition that brings together company teams from the region’s industrial sector. The new champions won the title with a dramatic 10-9 victory at the slow-pitch event. Along with the ball game, the 18 teams locked horns in events which included ice hockey and soccer. Part of the profits from the tournament will be donated to a local charity organization, as well as to a local sports team.
My first hundred days were an intensive learning period for me, supported by a sound economic business development despite the widening global impacts of the US credit crisis. I took over from Rudolf Hadorn who had looked after the Wind Energy activities before. The overall direction remained the same: operational improvements to be achieved across all production sites continued to be top priority. In the second hundred days the business started to get a bit bumpier.

What made the winter months bumpier?
The credit crisis began to impact our business – whether rightfully or just psychologically is actually irrelevant. We started to see ups and downs and had to make a couple of rapid, important and some difficult decisions. Although the order books of our main Wind Energy customers are full for at least the next 12 to 18 months, sales started to become more irregular.

You also mentioned ups?
Yes, I firmly believe that we are well positioned in the Wind Energy market. This market will continue to be very attractive in mid-term, the mega-trend towards renewable energies will prevail. Gurit is uniquely positioned with production sites in all major world areas and a comprehensive product offering for blade manufacturers – regardless of the production technology they use.

Did you turn those long-term strong points into actual sales?
Yes, we did: We won important new supply contracts in China. Without our own production facility in Tianjin, this would hardly have been possible. For various reasons: Firstly, wind turbine blade manufacturers in China need to source products locally as quite a large local materials content is required. Then, Gurit had rightfully invested into the competencies of our Chinese colleagues. A group of Chinese engineers had spent almost a full year at our technology centre in the UK. Towards year-end they went back and were instrumental in winning those new supply contracts. We can offer producers in China full local technical support.

Will Gurit predominantly grow in Asia?
We continue to grow globally. Europe remains a key market for wind energy. Here, wind farm projects are often utility-financed and they are often public or semi-public groups. So there is generally less of a financing issue in Europe than e.g. in America. There, the collapse of certain financial players has created uncertainty. Yet the new U.S. administration and its stronger focus on a sustainable long-term economy has brought some confidence back.

International market specialists expect less growth in 2009. Achieving double-digit growth rates may be too ambitious for the overall industry. At Gurit, we understand that growth cannot exclusively come from market growth. This is where our comprehensive product offering and our novel materials kick in.

How exactly so?
We are prime specialists in prepreg technology. The overall market trend points into that direction as prepregs allow building bigger, better performing and lighter wind turbine blades. This technology also offers important in-mould production time reductions not least thanks to new products like our SPRINT IPT or lower exotherm prepregs. Yet, infusion technology will continue to be an important production process, too. We also want to focus more on this technology, e.g. with our structural foam products and specially formulated resins.

What are your goals internally?
We need to be recognized as the leading materials specialist for wind energy applications offering the most competent technological support and the most complete, innovative product portfolio. This combination should result in convincing costs per finished part for our customers. So, our goals are clear: Operational excellence to achieve attractive selling prices, innovation to secure long-term product sales and very responsive technical support.
WIND ENERGY GROWTH IN CHINA

Since the People’s Republic of China issued its Renewable Energy Law, wind energy shows robust growth and the aims are set high: By 2020, China wants to install new wind energy capacity that roughly equals half of the whole global wind energy capacity. This is a gigantic increase. International reports show that in 2007 China ranked either third or second in terms of newly installed capacity with a global share of over 15%. The Chinese wind energy market is developing fast.

There are several trends that shape the Chinese wind energy market, says William Tian, Wind Energy Sales Manager of Gurit (Tianjin). “There is the overall growth of the industry driven by the increasing energy demand and the special focus on Renewable Energy in China. The group of important market players is changing quickly. After focusing primarily on production quantity and output, the focus shifts now more towards blade quality, reliability and total cost of ownership. This will also have a certain impact on production technology.”

Let’s look at these trends one by one: The demand for energy grows quickly in China and so does the need to seek alternatives to the largely coal fired electricity production. China declared in 2006/7 that it wants to double its share of renewable energy production from roughly 7% to 15%. This translates into reaching around 30,000 MW by the year 2020. This is almost half of the then installed global world capacity. At the same time, China requested that wind energy turbines contain at least 70% of local content. While foreign companies dominated the Chinese market until 2006, the year 2007 marked the point when local Chinese wind turbine production made up for more than 50% of the production. While western producers continued to grow in China, many new local Chinese manufacturers established themselves. Yet the top five producers made up some 80% of the market. Important to note, however, is that the two largest companies were already local manufacturers accounting for some 45% of market share. All in all, China today has some 40 established blade manufacturers in the wind energy market.

Gurit believes that prepreg technology will also become more widely applied by local Chinese blade manufacturers. “Winning important contracts for prepreg at local manufacturers in China, clearly points to that direction”, says William Tian. “Until one or two years ago, demand for wind blades was clearly bigger than supply. So the issue was to produce as quickly as possible a growing number of blades. Infusion technology was the technologically easier and a more rapidly available solution.”

As the Chinese wind energy market matures, the focus changes from “capacity first” to a more long-term cost-of-ownership focus, where blade performance, longevity and reliability become more important variables of the equation. With a tradition of supplying both western and Chinese wind blade manufacturers with prepregs, structural foams and specialist resin, Gurit offers the full set of production materials. “And we can offer our customers full technical composite processing support locally”, adds William Tian.
Markets: Ocean Energy

GENERATING A NEW INDUSTRY

If we believe the trend of the last 20 years and the latest research, global energy demand will almost double in the next 20 years. Demand may outstrip supply by as much as 18% by 2020. Ocean Energy may well be one answer. Gurit has decided to explore this new field.
Currently over 80% of electricity is generated by burning fossil fuels. While fuel prices are currently low, it will not stay that way: Oil production is expected to peak in eight years and gas in thirty years. Yet, sharp price rises are inevitable before the peaks.

THE COMING ENERGY GAP
Coal reserves are sufficient to last until the end of this century but the use of coal can only increase if clean technologies become commercially competitive. Nuclear power is sometimes heralded as the saviour to the energy gap but many experts are predicting that a uranium deficit is likely to emerge in a matter of decades. With a timescale of ten to fifteen years necessary to build a nuclear power station, the short-term issue becomes significant.

FOSSIL FUELS ARE NOT ENOUGH
Renewable energy, whilst not being the overall solution for the potential energy shortage, can at least significantly contribute to bridge the coming energy gap. Existing technologies such as wind or solar energy will see continued long-term growth. However, they both depend on the atmospheric conditions at any give time and thus are incapable of providing a consistent base load required for energy production. In order for renewable energy to become a significant continuous and long-term contributor a diverse portfolio of technologies will be required.

OCEAN ENERGY AS PART OF THE SOLUTION
At Gurit, we strongly believe that this will include Ocean Energy. Gurit Strategic Business Development is a small team tasked with researching, selecting and building long-term new businesses for Gurit. The Newport based team has identified its first target in the emerging Ocean Energy industry and launched a specialised technology offering at the important composites trade show JEC, in Paris in late March.

Ocean Energy includes energy from wave motion and tidal stream and is estimated to have a practical recoverable capacity which is approximately five times the equivalent of the current installed wind energy capacity. Industry experts and independent government research predict a year on year growth in the use of Ocean Energy of between 25 and 50%.

PREDICTABLE ENERGY PRODUCTION
Tidal energy is completely predictable and repeatable on a six hour cycle thus removing some of the issues associated with other ‘natural’ sources of energy. Wave energy, although not as regular or predictable, is very abundant in many regions around the world. Europe including the British Isles holds 16% of the world’s Ocean Energy resource and 60% of the technology developers; it is with these developers that Gurit is forming its strategy to build a new industry.

COMPOSITES ARE KEY TO SUCCESS
There is a wide variety of different concepts for the capture of wave or tidal energy with a handful proven at a commercial scale. However, the secret to success in operating and maintaining these devices in a harsh, corrosive marine environment will lie in the choice of construction materials. Gurit holds the key with experience in marine, sub-sea, offshore and civil engineering as well as wind energy markets, a broad range of high performance composites materials and world leading engineering of large structures.

In previous years, Gurit has engineered and prototyped components such as small scale blades and a complete 1/8 scale turbine. Engineering work has been done for a number of other device developers and via its UK distributor, Gurit materials are being sold to more. Depending on the design concept, the amount of composite materials in an Ocean Energy device varies considerably but can always generate significant global material sales. Tom Royle, Head of Gurit Strategic Business Development says « Clearly the market potential is too big to ignore. By targeting those developers who we believe have strong intellectual property from the earliest opportunity, we can not only create long-term, successful alliances but also become an enabler for device developers and build a significant, sustainable market for Gurit products and services». 
The Maxi Trimaran Banque Populaire V (MBPV) was set out to be the largest and fastest offshore sailing trimaran on the water. Offering world-leading structural engineering consultancy and over 20 years of experience alongside the world’s leading designers, Gurit’s marine business SP was part of the design and construction team building a boat destined to challenge and beat all existing sailing records.

The French based world leading multihull naval architects VPLP approached Gurit’s marine specialist SP for a truly ambitious project: The Maxi Trimaran Banque Populaire V (MBPV) project was to be the largest and fastest offshore sailing trimaran on the water. The aim of MBPV is to challenge and beat all existing offshore sailing records, with the Jules Verne record being the pinnacle: racing around the world in less than 50 days at an average of around 20 knots and top speeds in excess of 45 knots. Due to its enormous size – MBPV is 40 meters long, 23 meters wide, more than 800 square meters of developed area and 24 tons displacement – the architects put together an unprecedented design team.

Unlike most other marine projects, MBPV was under the scrutiny of two structural engineering offices: HDS and Gurit’s SP. HDS have extensive experience in offshore multihulls and have been instrumental in bringing these boats to the highest level of performance. HDS and VPLP have designed offshore multihulls together for the past 15 years. Their experience in terms of load cases for this type of structure is unique in the marine industry. Sharing this experience with SP created a positive team environment for all involved. The main objective of this unusual approach was to ensure that the engineers were constantly challenged in a positive way. In order to achieve the best solution, every stage of the project was given an owner while the other design office acted as consultants. The collaboration between the two companies was a proven success during the project and beneficial for both.
**ENGINEERING AS THE BUILD PROGRESSES**

Another key element of the project was that two boat yards shared the build of the boat: With CDK Technologies based in Port la Forêt and JMV based in Cherbourg building sections of the boat, the build time was significantly reduced to a mere 18 months. Yet, this setup did increase the pressure on the design team for delivering construction drawings and laminate specifications to two builders. It is important to understand that race boat projects are usually engineered as the build progresses. Although there is always the need for these boats to be built within a given budget, there was no restriction to the choice of material technology available to the engineers. This led SP and HDS to specify several fiber grades ranging from high strength carbon, to intermediate modulus carbon and high modulus carbon, depending on the areas of interest. Also both honeycomb cores and structural foam Corecell were used to optimize the structure weight and strength-wise.

**SOLVING AN EQUATION WITH COUNTLESS VARIABLES**

Engineering is often about compromising. Obviously structures need to be sufficiently strong and stiff. A structure that is too stiff, however, has its drawbacks, as often stiffness is at the expense of weight, resistance to dynamic loadings and comfort. Comfort is a rather dull concept when applied to a race boat, but when the intention is to race for approximately 50 days in any sea state or wind strength, the structure needs to be tolerant. Again all a matter of compromise!

**FEA AS A DESIGN TOOL**

Finite Element Analysis (FEA) was widely used throughout the project. Although this is a very powerful tool, it never replaces either engineering judgment, nor build practicalities. FEA provides the engineers with accurate behavior data of the structure. When post-processing the results, the engineers ensure that the structure behaves as expected under load. And check the strength of every ply.

Extreme race boat structures such as MBPV are only made possible by the high specific strength and stiffness featured by advanced composite materials. Engineering MBPV was a great experience for all the team at SP and we wish the Banque Populaire Team a successful record hunt for the years to come.

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**FINITE ELEMENT ANALYSIS PROCESS**

- Create the geometry using 3D modeling capability – usually supplied by the designer
- Create a mesh supported by the geometry modeled by shell elements of about 150mm by 150mm in size for this project
- Assign the laminate properties for the whole structure (in excess of 1400 different laminates for this project)
- Create the individual loads such as rig loads and pressures applied on the hulls
- Create the load cases (combinations of individual loads) – 9 different cases for this project. The main load cases under scrutiny for this project were modeling the leeward float travelling through a wave with different sail combinations
- Post process the results – with regard to stiffness, strength, and buckling
- Eventually modify the structure to implement laminate modifications and verify that all strength and stiffness criteria are met.

**MAIN LOADINGS APPLIED TO THE MAIN HULL**

- The sea pressure loads as the boat is exposed in a big sea way or as the boat is piercing through waves
- The large torsion loads applied between the forward and aft cross beam when the leeward float nose dives
- The high local loads generated in way of the cross beam connections
- The local point loads such as the rig attachment points or sail trimming dedicated fittings – some of them see working loads in excess of 30 tons
- The global bending loads. There is a requirement for the main hull to be stiff enough longitudinally in order to allow the crew to get the most performance out of the rig i.e. the «engine».
FIRM GROUND IN THE SKIES

Gurit is a key supplier of composite materials for the aerospace industry. A large portion of the materials we manufacture for this market go into the various families of Airbus planes. EFW Dresden uses Gurit prepregs to manufacture flooring and lining panels, also for Airbus’ flagship, the A380, with its two passenger decks.
A TRUCK FULL OF MATERIAL PER WEEK
Gurit produces various types of prepregs based on carbon and glass fibre reinforced phenolic resins for EFW. «Another specialty are strong, multi-layer reinforcement laminates which are bonded into bore-holes of the finished low-weight panels. It is into or onto these reinforcements that the seat rows, walls and other installations are mounted,» explains Udo Burggraf, Gurit’s Head of Aerospace and Rail Business. On average, Gurit sends off cooling trucks full of prepregs every week to Dresden, making EFW the single most important destination of Gurit prepregs in the aerospace field. Prepreg materials need to be stored and transported at exactly defined temperature and humidity to prevent uncontrolled curing of the material.

Upon arrival in Dresden, the Gurit prepregs are again put into a cooling container until they are used. The production process of aerospace panels typically starts with Nomex® or Kevlar® honeycomb sheets. The final shape of the panel becomes apparent when the edges of the honeycomb material are filled to later provide a perfect edge when cut to size. Gurit prepreg sheets are bonded to either side of the sandwich core and then the sheets are pressurized and cured for about two hours. The big sheets are subsequently CNC-processed into the various panel forms with holes being cut out for the reinforcement elements. The finished panels are then assorted and stowed in re-useable containers prior to shipment to the many different assembly locations.

COMPLYING WITH THE MOST DEMANDING REGULATIONS
What are the special requirements for aerospace materials apart from weights below 3kg per m²? «While an aircraft seems to be a stiff construction at first sight, take off, flight turbulences and landing put it under tremendous varying stress. Even the interior needs to respond to and cope with these forces,» explains Mr. Assmann. «In addition, our materials have to fully comply with the fire retardant requirements of Airbus and other international fire protection regulations regarding flammability, smoke density, toxicity (FST) as well as heat release», adds Udo Burggraf. «The Gurit engineers and chemists are constantly working on new and more performing materials, also based on new chemical building blocks like e.g. benzoxazines.»

15 years of cooperation are quite a long time to look back on to. SHAPE asked Mr. Assmann about his experiences with Gurit: «Gurit as we know it today did not exist when we first started to buy prepregs in Switzerland. The Zullwil plant is with the Gurit Group for about ten years now and we certainly realized that advanced composite materials is the core competency of Group. In aerospace, projects and production processes are very long-term. Therefore, we also need reliable, long-term and fully dedicated suppliers.»

THE RIGHT STRENGTH FOR EACH SPECIFIC USE
Elbe Flugzeugwerke Dresden (EFW) started to manufacture fibre-reinforced, light-weight sandwich components for Airbus planes over 15 years ago. And they have been using specialty products manufactured at Gurit for all that time. «Light-weight materials are key in aeronautics», says Andreas Assmann, Senior Vice President Components at EFW. «Most of our materials are manufactured as sandwich materials combining a light-weight honeycomb core structure with layers of prepreg materials. Gurit is one of our key suppliers of prepregs». Flooring is by far the most important product category produced at EFW. Other applications include bullet-proof cockpit doors or side walls used for the galleys or the lavatories.

50,000 DIFFERENT COMPONENTS
In order to reduce weight in an airplane as much as possible, the flooring largely differs in today’s planes depending where exactly it is used. Floors in cargo bays have to bear more weight than the average floor beneath the rows of seats of the passenger deck. The aisles need to cope with less weight than in the galleys where all the food and duty-free material is stowed away. «All in all, EFW produces over 50,000 different components for Airbus’ whole range of aircrafts», explains Andreas Assmann. And it won’t stop there! With each new plane design, the number increases massively. Already A380 added many new specific pieces with its growing composite content. And yet, the new A350 is expected to include again many more new composite components.

The biggest challenge for EFW is to manage the assortment of these countless components. When you realize that hardly any plane is similar to another as each craft is largely custom-built, one can fathom the complexity of this supply chain. And EFW does not only supply to the main Airbus sites in Toulouse, Hamburg or St. Nazaire. «In Europe, we have some 50 different units assembling various pre-kitted component systems. Many of these need certain flooring or lining panelling material at an early stage, way before when the actual aircraft begins to take shape at the main Airbus sites.»
Cyrus Yachts is a recently established builder of custom and semi-custom yachts in length varying between 30 and 42 meters. The company is under management of the Dutch Vitters Shipyard, yet the Boats are built at Cyrus Yachts in Antalya, Turkey. Vitters shares the pride in the Cyrus projects created and supports these yachts with its knowledge and work force. SP, the marine business of Gurit, was already instrumental in the engineering, design and build of Angel of Joy and Fansea, two exclusive yachts serving as development platforms for Cyrus One.

Exhibited at the Cannes and Monaco Yacht Shows in 2008, Cyrus One, the first «Cyrus 34» by Cyrus Yachts combines traditional skills with refined styling. Composite materials were specified for this traditionally styled semi-displacement motoryacht. Foam panels were laid over a laser cut wooden frame and manually shaped by skilled craftsmen at the yard in Antalya, Turkey, to meet the distinctive superstructure design. SP Corecell™ was selected for this process due to its fine cell size and tough properties which make it easy to sand and shape into complex curves. This build method minimised the build time and cost as there was no need to build a full male or female mould.

Other benefits that made Corecell™ the product of choice included very low levels of out-gassing which in turn prevents hull blistering, as well as high toughness to create a very durable structure.
THE USE OF THIS BUILD TECHNIQUE ALLOWED THE HULL TO BE CREATED FAITHFUL TO RENOWNED NAVAL DESIGNER RENÉ VAN DER VELDEN’S VISION WHILST ALSO REDUCING THE OVERALL WEIGHT. WITH A FUEL TANK OF 19,000 LITRES AND POWERED BY TWO CATERPILLAR C32, V12 ENGINES PROVIDING 1825 HP AT 2300 RPM, CYRUS ONE FEATURES AN AUTONOMY RANGE OF 2.375 NM AT AN ECONOMICAL SPEED OF 12.5 KNOTS WHICH TRANSLATES TO A LOW FUEL CONSUMPTION OF ONLY 100 LITRES PER HOUR IN TOTAL.

AS WELL AS A WEIGHT ADVANTAGE OVER STEEL AND ALUMINIUM, THIS BUILD METHOD ALSO PROVIDES A STRUCTURE WITH FAR GREATER SOUND AND HEAT INSULATION AND LESS RISK OF CORROSION. THE SHAPED HULL AND SUPER-STRUCTURE WERE LAMINATED USING SP AMPREG 22 LAMINATING RESIN AND SLOW HARDENER TO GIVE LONG WORKING TIMES IN THE RELATIVELY HIGH AMBIENT TEMPERATURES. SP340 AND SP740 WERE ALSO UTILISED FOR BONDING AND CORE BONDING. BUYERS CAN LARGELY INFLUENCE THE INTERIOR OF THIS LUXURIOUS SEMI-CUSTOM POWER YACHT.

A RENOWNED FAMILY TREE
Following from the success of ‘Angel of Joy’ and ‘Fansea’ – two luxurious yachts also featuring SP Engineering and products – it was Cyrus’ aim to create another truly practical vessel, capable of withstanding all conditions, whilst offering an executive level of comfort and superior performance.

http://www.cyrusyachts.com
GURIT (TIANJIN)
KITTING FACILITY IN FULL OPERATION

GURIT (TIANJIN) SUPPLIES FULL RANGE OF KITTED STRUCTURAL FOAM PRODUCTS
Gurit (Tianjin) in the People’s Republic of China is now in full production of Corecell structural foam spar and shell kits for wind turbine blades. These products are manufactured for some of Gurit’s key customers in Asia. A newly installed 5-axis machining centre along with other smaller machines can make the complete range of parts required. This includes complicated curved three-dimensional shapes and grooved parts. The machine’s accuracy can ensure dimensions within +/- 1mm.

EASY-TO-USE COMPLETE KITS
Cut and machined to specifications, all the various pieces of a full kit of structural foam parts for a wind blade shell or spar are packaged in the correct order of use and exact position. This facilitates greatly the in-mould processes at the customers as workers will find it easy to assemble the parts to the exact specifications: Taking one piece after the other provides a simple laying-out of parts in the customer’s blade moulds.

EXPANDING AUTOMOTIVE BUSINESS
Gurit began construction of a new pilot facility for the manufacture of Carbon Fibre Class A car body panels in 2006. This facility employs cutting-edge manufacturing equipment to prepare, mould, machine, paint and inspect four kinds of body panels for the equally advanced Aston Martin DBS. Early in 2007, the facility was made operational and work began to train and qualify each stage of the manufacturing process. The first parts then rolled off the production line in the second half of the year. A steep increase in requested volumes in the start-up phase put significant pressure on the quickly growing automotive team. With a high level of enthusiasm, love for the product and commitment to the customer, Gurit workers, led by Peter Dyer and his cell leaders, mastered this challenge.

In 2008, Martin Starkey was appointed Managing Director of Gurit Automotive and led the team to successfully deal with rising production volumes. The overall success of our pilot facility was recognized by the market with a second program nomination confirmed in 2008 and a constant stream of enquiries from the majority of the world’s prestige car manufacturers. To meet the demands of current and potential customers and to ensure that the technology continues to develop in line with market requirements, the automotive group was brought together in a new automotive centre, directly adjacent to the production facility. The team now includes all relevant functions: new development and account engineering; commercial activities; plant quality and production management and manufacturing engineers. The new offices will also be the home of the CATIA design suite and will ensure our capabilities in composite panels and tooling design remain unmatched within the industry.
Gurit is proud to present its next generation of aircraft interior prepregs based on PB1000. PB1000 is a modified benzoxazine resin without any free formaldehyde and free phenol, and satisfies the most recent and stringent environmental standards like AIRBUS AP2091. The novel material class features a rapid curing time with again no volatile compounds being set free in that process. So, these prepregs offer great advantages for our customers’ manufacturing processes. PB1000 generates a perfect void free and porosity free surface which greatly reduces the need for additional refining procedures common with traditional phenolic resin prepregs. This will result in considerable time and cost savings in parts production.

Gurit’s novel PB1000 fully complies with all demanding international JAR/FAR fire protection regulations regarding flammability, smoke, toxicity (FST) and heat release. Due to its excellent mechanical performance, PB1000 is perfectly suited to fulfil present and forthcoming stress criteria for interior design.

Meeting increasing demands on cost efficiency in aircraft interior manufacturing, PB1000 is also designed for the commonly used fast “hot-in / hot-out” curing processes.

This unique material performance combined with a competitive cost price level makes PB1000 an advantageous choice for aircraft – and potentially rail carriage – interior applications and is clearly capable of replacing phenolic systems.
MANY SMALL STEPS LEAD A LONG WAY

To operate as environment-friendly as possible requires ongoing efforts beyond an ISO14001 registration. At Gurit (UK), reducing waste that goes into landfill is a top priority, not least because landfill capacities are scarce on the Isle of Wight. With clever initiatives, Gurit (UK) not only saves money but also turns former waste into valuable resources.

Since 2002, Gurit (UK) has been continually improving its performance in terms of environmental impact. Prior to achieving its ISO14001 registration, an initial review of site activities was undertaken to establish a sound basis for evaluating aspects and impacts and to provide a structure for future development of an Environmental Management System. An Environmental Steering Group then set about examining areas of environmental concern including emissions to air and water, all waste outputs, resource and energy efficiency, noise and odour emissions, contamination of land, and impacts on local neighbours.

MINIMISATION OF LANDFILL WASTE

One of the key environmental issues identified was the volume of waste disposed of to landfill. There is no incineration plant on the Isle of Wight and landfill capacities are very limited. Gurit (UK) made significant progress over the years to reduce landfill waste with an array of various initiatives: Silicon coated release paper is used as an intermediary product in the production of prepgs. This process paper used to generate a large waste stream of several hundred tonnes per year. Gurit now works with a company which collects the used paper for recycling. It is then used in the manufacture of

UK WASTE MANAGEMENT 2008

2008 Objectives & Targets: To reduce volume of waste we send to landfill to < 1000 tonnes by implementing waste minimisation and recycling initiatives.
In 2008 we recycled 345 tonnes of paper which would have cost around GBP 25,000 in disposal charges had it gone to landfill. In contrast, the recycled paper now even generates small income.

Liquid raw materials including epoxy resins are delivered to Gurit in a variety of containers. Successful efforts have been made over the last few years to have the bulk of these materials being delivered by tanker. This has reduced the number of containers such as 200-litre drums and Intermediate Bulk Containers that previously were disposed of as Hazardous Waste.

Wooden pallets utilized to deliver raw materials to us previously went to landfill. Where possible, these pallets are now reused for general storage in our own warehouse or for sending out finished products to our customers. The remaining pallets are now taken away for recycling, at no cost to Gurit. During 2008 over 16,000 pallets weighing approximately 543 tonnes were collected.

Low Density Polyethylene plastic packaging is used extensively by suppliers and commonly ends up as waste, too. It is now compacted, baled and taken away to be recycled. Due to the success of this initial waste programme Gurit also purchased a cardboard baler. 2008 figures indicate that 71 tonnes of baled cardboard and 12 tonnes of plastic were recycled last year.

Working with Customers

Improvement initiatives also extend to products that Gurit supplies to its customers. Many of the epoxy products are supplied in steel drums of varying sizes, which – when emptied – still contain residues which can then present disposal problems for customers, particularly the smaller firms that have difficulty dealing with expensive waste streams.

An environmental improvement project resulted in the introduction of a lightweight plastic liner, which fits inside the steel drums. This liner can then be removed leaving the steel drum clean and easy to reuse or recycle. This also helps reduce disposal costs as the liner, weighing less than a kilo, is all that needs to be disposed of, not the 21kg steel drum. In 2008 we began working with a major local customer to re-use 200 litre steel drums. The containers are returned in good condition from the customer and are re-filled with fresh product. Previously they were sent to a scrap merchant after the drum liners were removed.

Gurit UK has even won a packaging award for a clever innovation: Most of the cardboard boxes used at Gurit can be constructed without the need for metal staples. This again makes recycling a lot easier for our customers as the boxes only consist of one material.
HELPING THE NEXT GENERATION OF PROFESSIONALS TO GROW

In complex trades, like the manufacture of advanced composites, vocational training is important. While apprenticeships always enjoyed great popularity and are commonly seen as a key pillar of professional education in countries like Switzerland or Germany, apprenticeships were pushed to one side in the UK in the 1970’s and were replaced by short-term training schemes resulting in a skill shortage in the 90iest. Gurit (UK) believes in its commitment for apprentices.

«I believe vocational skill training was at its lowest in the 1980’s», says Trevor Collins who looks after the apprenticeship programme of Gurit (UK). «The British manufacturing industry took a downturn then and when things started to improve again in the 1990’s, industry started to experience a serious skill shortage.» This was also true for advanced composites materials manufacturing, engineering and processing. There is no use crying over spilt milk, as the saying goes, so Gurit (UK) decided to develop its own Apprenticeship programme, investing in young people, building skilled technical operational teams whose skills would be transferable within the composite industry. The Apprentices are selected for employment with Gurit (UK) in a two-stage interview process involving Human Resources and Operations Management. «Educationally we seek young people that have achieved «A» to «C» grade General Certificate Secondary Education and are 18 years of age», Trevor explains. The minimum age is required so that the GB Government Health & Safety Executive will allow people to work involving chemicals. In exceptional cases Gurit can employ people of 17 years which we would call Foundation Apprentices and would be enrolled full time at the Isle of Wight College, attending Gurit (UK) during semester breaks. «Once selected, the Apprentice will be sponsored throughout the apprenticeship by one of the Operations Manufacturing departments.»

Throughout the three-year apprenticeship, Gurit (UK) works closely with the Isle of Wight College as the external training provider. The apprentices attend college one day each week. Gurit soon realised that constant changes in the way the company operates, internally and externally, require recurring programme update in its content and delivery. The apprenticeship programme is aligned to the current operational structure: Prepreg, Formulated Products and Automotive Process Streams, including training in the manufacturing support functions such as Product Engineering & Planning, Purchasing, Maintenance, Quality Assurance. In addition Apprentices training is enhanced by spending time within the administration of the three target market areas Wind Energy, Transportation and Marine.

THE APPRENTICES THAT HAVE COMPLETED THEIR TRAINING ARE PROGRESSING WELL WITHIN GURIT:

Chris Cade
- completed his apprenticeship in 2007.
- He enjoyed training time spent with Prototyping moving on to Automotive where his potential was soon realised and was promoted to the role of acting Team Leader. Chris achieved C&G Level 3 Progression Engineering.

Ross Andrew
- is now employed as a Project Engineer and is completing his Higher National Certificate Engineering.
- Through his training in operating manufacturing machinery and process engineering Ross is able to use knowledge gained to manage and develop aspects in his role as a Project Engineer.

Mark Abrook
- is now employed as a Maintenance Technician. Mark achieved a C&G Level 3 Progression Engineering.
- Marks training was built around Planet Planned Maintenance System used by Gurit UK.
THE GURIT SYLLABUS

Year 1
- Working in the sponsoring department
- Learning to operate machines and systems
- Begin to learn the principles of Lean Sigma
- Total Productive Maintenance (TPM)
- The 5s Principle
- Learn the principles of H&S at work and how these are operated in line with OHSAS 18001 at Gurit (UK)

Year 2
- Apprentice will begin to learn the art of inter-departmental cross functional manufacturing operation training, from basic to advanced level
- Develop knowledge of Lean Manufacturing to advanced level
- Develop further knowledge of Six Sigma, working toward Yellow Belt standard
- Expand Knowledge of Process Quality Control. Be familiar with all aspects of Health & Safety
- Build a project from start to finish. Where possible attend tests and trials
- Continue cross functional training to an advanced level working largely on their own initiative with minimal supervision
- Work on Six Sigma project teams to achieve Yellow Belt standard
- Achieved a job related NVQ Level 3, or a BTEC ONC and be aiming to expand knowledge and skills.

Year 3
- Apprentices will be given the opportunity to work within the 3 Business Units and Product Engineering
- Continue their education through to Higher National Certificate in Mechanical Engineering

Leah Groves
2005 UK Apprentice of the year in Plastics Industry is now employed as a Product Engineer and is currently studying for a BSc in Engineering Management (work based degree)
An emergency leaves no margin for error. That’s why each member of the Gurit Emergency Response Crew-Team-Unit receives 32 hours of training every year to maintain readiness. Proud of being part of the team, the 45 members now sport the Emergency Response Crew-Team-Unit insignia on their work apparel.

It’s clear that the dangerous materials used by Gurit may represent a high risk of serious intoxication, explosion and fire. This is why a specialized team, trained to deal with such matters, intervenes in emergency situations to ensure the safety of employees, company assets, and the environment especially at the Corecell plant and more recently also at the Prepreg plant.

UP TO 40 RESPONSES YEARLY
In all, the Gurit (Canada) Emergency Response Unit has 45 members – 33 at the Corecell plant divided into five teams/shifts, and 12 at the Prepreg plant divided into two teams/shifts. On average, the Corecell teams must respond to some 40 incidents each year, which mostly are spillages of dangerous materials, fire starts or uncontrolled chemical reactions. For this reason, training is the team’s top priority. In emergency response, it is imperative that we are proactive and ready to respond instantly.

ON-GOING TRAINING WITH SCENARIOS
To accomplish this, the Emergency Response Teams undergo several training rounds in order to hone the skills and knowledge of each team member. Whether fighting fire or responding to situations involving dangerous materials, team members are presented with various practice scenarios in order to evaluate their competencies in real situations. Real emergency situations obviously leave no margin for error, so that each team member must acquire the appropriate knowledge and master emergency response techniques.

A REFERENCE IN SAFETY
Over time, team members have become references in safety matters. To express this, the team developed and now wears its own insignia since August 2008. The insignia gives the team higher visibility and enhances team spirit and pride. In Quebec, many industrial companies also have emergency response teams, which in fact constitute a valuable asset to local firefighting brigades. Their specialization in dealing with dangerous materials used in our plants and knowledge of our facilities can be of vital importance to firemen in the event of an emergency.

The team’s progression is well and beyond considerable: last year saw the implementation of a comprehensive emergency plan, the creation of a mission, more advanced training and greater involvement.

However, there is still a long way to go to maintain optimal response capabilities. That’s why the Emergency Response Team’s orientations are always chosen in line with our slogan: «Our Priority, Your Safety».
Gurit likes to work together with and support engineering students so that they can familiarize themselves with the beauty of advanced composites in practical work rather than just read about them in text books. When eight students of the University of Sherbrooke, Canada, approached Gurit (Canada) with an exciting electro-solar boat project, we rapidly shared their enthusiasm.

Eight University of Sherbrooke students in mechanical engineering joined together to design and build an electro-solar boat as their end-of-bachelor’s degree project. The new boat should neither emit pollution nor noise in operation. The use of an electric power unit – charged by on-board solar panels to increase its autonomy – was key to the success of this project, as was the design, optimized for energy efficiency.

Working in close partnership with Gurit, the team developed a high performance displacement hull of five metres length. The students were given access to structural and manufacturing process engineers of SP, based in the U.S. Our specialists helped review designs in terms of structural integrity and dimensioning, and provided training and assistance in composites processing for the boat manufacturing. Jasmin Théroux, one of the students’ team commented: «We very much appreciated the extensive training during one complete week with Gurit’s composites specialists in their laboratories. Finally, Gurit has even provided all composite materials for the manufacture of our boat, while ensuring a follow-up during manufacturing.»

EPRION as the boat was baptized used a broad collection of Gurit’s SP branded marine products including Corecell structural foam, Ampreg laminating systems and Spabond adhesive systems. On a frosty December 1, 2008, after two years of design, development and construction, EPRION was launched at Magog Lake in Canada. A number of tests were carried out to ascertain the five-passenger-craft’s technical specifications. All were a success: EPRION achieved the targeted operations autonomy of 4 hours at a full speed of 12 km/h. The solar panels provide 610 W; however the boat can also be charged by an 110v power outlet. The team of students is now looking forward to presenting their prototype of a pollution and noise free, electro-solar boat at various exhibitions in Canada in 2009. Gurit and SP would like to congratulate them on their success!

Further information about the project can be found at www.eprion.org

Gurit (Canada) unterstützte kanadische Studenten beim Bau eines Solar-Bootes.

在固瑞特（加拿大）公司的帮助下，加拿大学生开发出了太阳能动力艇。
GURIT AGENDA 2009

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:

» JEC, Paris; 24th March 2009 - 26th March 2009
» Aircraft Interiors Expo, Hamburg;
   31st March 09 - 02nd April 09
» The Automotive Designers Show, Milan;
   07th April 2009 - 09th April 2009
» Wind Power Asia, Beijing, 08th July 2009 - 10th July 2009
» China Composites Expo 2009, Shanghai,
   02nd September 2009 - 04th September 2009
» Monaco Yacht Show 2009, Port Hercules, Monaco,
   23rd September 2009 - 26th September 2009
» JEC Asia, Singapore, 2009
   14th October 2009 - 16th October 2009
» METS 2009, Amsterdam,
   17th November 2009 - 19th November 2009