

shape

The Gurit Magazine for employees, customers and suppliers
N° 20 / 2020 – English

Powerful winds in India ⁴ Co-location of core materials and
kitting operations ⁸ Efficient wind turbine repairs ¹⁰ Next-gen
aerial fire suppression systems ¹² Supporting a young
British sailing team preparing for the Olympics ¹⁴ Upcycling
composites into innovative interior design ¹⁶ Sustainable
packaging ¹⁷ World's first electric, zero emissions racing
yacht 'J-Bird III' ¹⁸ Sustainable forestry in Ecuador ²²
Opportunities for a green value chain ²⁴ Green hydrogen on
the way ²⁶ From bottle to boat ²⁸ IMOCA 60s at the Vendée
Globe race around the world ³⁰ Longest wind turbine
blade mold ever built ³³ Development of environmentally
friendly technologies ³⁴ Placing safety at the center of our
operations ³⁸

Imprint / legal notice Gurit Services AG, Group Communications, Thurgauerstr. 54, 8050 Zurich, Switzerland

Editor in chief Thomas Nauer, Head of Marketing & Corporate Communications ; Copy: Emilia Bergquist, Monique Norris, Sara Watson; with contributions from customers, partners and Gurit team members around the world.

Proofreading Jocelyn Massue.

Contact shape@gurit.com

Photo credits AdobeStock (cover, 2), Unsplash (6), Helitak (12-13), Mastfell Sailing (14-15), MM Composite (16), Ocean Crusaders (18-21), Whole Forest (22-25), Genossenschaft Migros Ostschweiz (26), H2Energy.ch (26), Nelhydrogen.com (27), Boston Whaler/BBG (28-29), GauthierLebec/Charal (30-31), Lloyd Images (31), Baltic Yachts (41). All other pictures: Gurit Archives.

Shape is available online at: www.gurit.com/News--Media/Shape-Magazine

Shape The Gurit magazine is published under Creative Commons license by attribution, share alike.

Dear Reader,

The year 2020 came at us from unexpected directions. We are faced with a worldwide pandemic which impacts our personal lives and curtails our individual freedom, spreading fear in economies in both free and controlled global societies. It has shown us limits of doing business globally and added unpredictability into our undertakings. COVID-19 has, however, not only resulted in visible losses of human life and resources, it has introduced disruptive change to the way we live, and ultimately, the way we do business as well.

We at Gurit have all worked extremely hard to deal with the new – and hopefully temporary – reality of keeping our business afloat by strictly applying the health rules while serving our customers who are also struggling. Concerns for colleagues, relatives and friends affected by the virus, crippling supply chain disruptions, transportation challenges, multiple and sequential customer plant “stop-and-starts”, running with incomplete shifts – this year has had it all – and still does. Thank you all for going the extra mile, and leading and acting with confidence and perseverance.

Despite the challenges the pandemic has presented, together we were able to achieve continued business growth of 4.1% in the first nine months of 2020. And yes, we managed to open our new Mexican plant for both kitting and extrusion, and we continued our India expansion for materials, tooling and kitting. We have leased the sites and hired the first people, and by the end of 2020 we will be opening a third kitting plant in China – this time in Wenan. These achievements clearly demonstrate our passion, capability, courage and confidence as team Gurit.

We have also continued to implement our new corporate values, mission and our vision “with passion for a sustainable future”. In this issue of SHAPE, you will see sustainability initiatives undertaken by our company, our customers, suppliers and wider markets.



Sustainability is an important driver of our strategy and operations. And we continue to place Health and Safety in the foreground. The wellbeing of our colleagues and customers is fundamental to our collective success. And with our Safety-First training program launched during 2020, we are ensuring that safety is embedded in our culture and remains at the top of everyone's mind. We trained well and so far, we have hit the first third of our 50% H&S improvement goal for 2020-2022.

Climate neutrality at Gurit is another key direction – not only supporting renewable Wind Energy and Lightweighting, but also achieving it in a sustainable way. We will announce our climate neutrality target date by the end of this year and we will publish our greenhouse gas footprint in our next Sustainability Report.

On a personal note, this will be the last editorial you will read from me in the function of CEO of Gurit. Thirteen years have passed in a blink – challenging, exciting, interesting and run with all the dedication I could possibly give to this company. As of January 4, 2021 we will begin handover tasks to my successor, Mitja Schulz. Please give him the same loyalty, commitment and passion I was so grateful to receive from you during my many years in office.

Yours sincerely,

Rudolf Hadorn CEO
November 2020

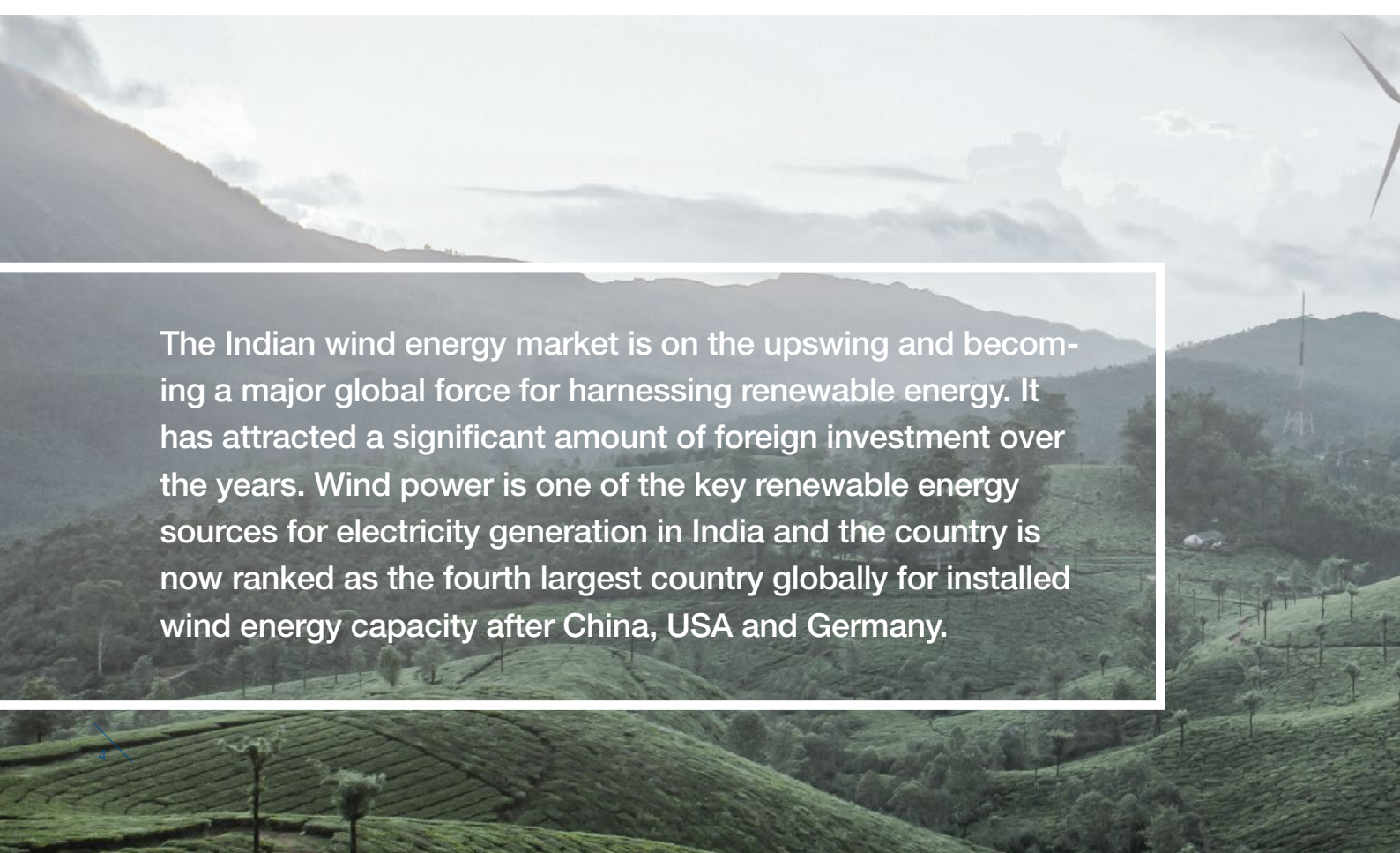
Powerful winds in India

The growth in renewable energy in India is proving to be one of the most effective solutions for reducing the need for fossil fuels, limiting coal imports and shrinking environmental pollution. Wind and solar energy are leading the way towards a green and clean electricity supply for the country.

A rapidly growing Indian wind energy market

Wind power generation capacity in India has grown to 37 gigawatts in 2020. The Government now has an ambitious plan to add 20-25 gigawatts of wind energy in the next three to four years. The goal is to increase India's wind energy contribution to 20% in total of the electrical energy pie, and to reduce greenhouse gases.

With an annual production of 7 gigawatts of wind turbines for domestic use and exports, India contributes 10% of the global wind turbine production and has become an export hub for wind blades with large numbers being exported to Europe and the USA. This trend is expected to accelerate over the coming years.

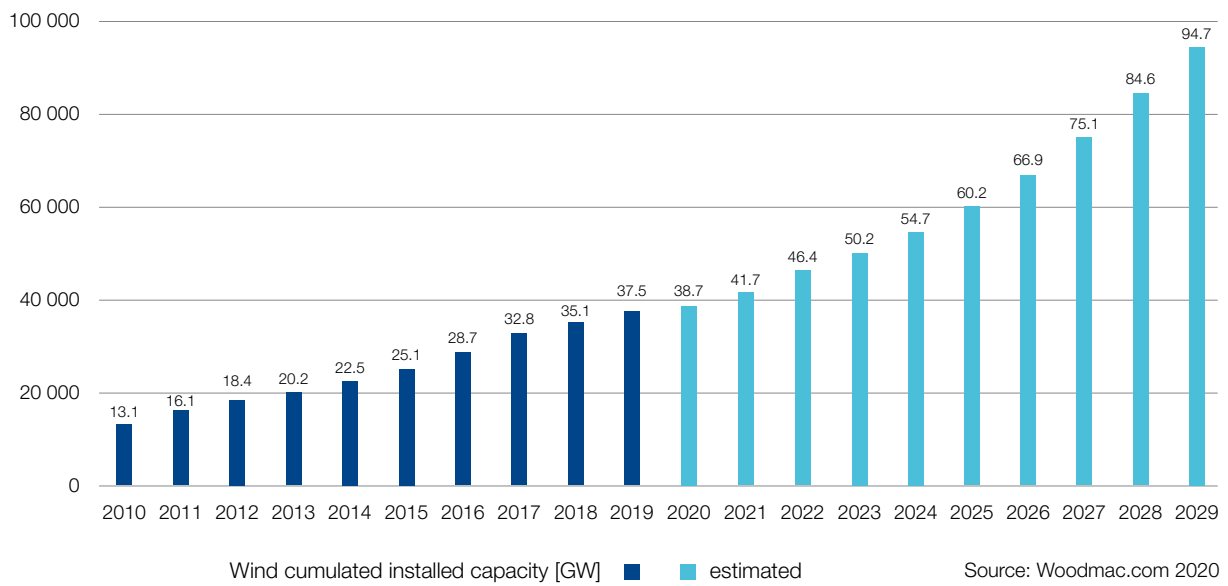


The Indian wind energy market is on the upswing and becoming a major global force for harnessing renewable energy. It has attracted a significant amount of foreign investment over the years. Wind power is one of the key renewable energy sources for electricity generation in India and the country is now ranked as the fourth largest country globally for installed wind energy capacity after China, USA and Germany.

Wind farms as a job creator

Wind energy farms have spread across the South, West and North regions of India. A major advantage of wind energy farms is their ability to support rural employment and uplift the rural Indian economy.

The biggest advantage however is that with wind energy, the fuel is free, and it does not produce direct CO₂ emissions. Wind farms can also be built reasonably fast and the wind farmland can be used for either farming or solar power plants as well – therefore serving a dual purpose. It is also cost-effective compared to other forms of power generation.





"Gurit has been serving the Indian wind industry for well over a decade. With global Wind Turbine Generator OEMs confirming their strong local and export books in India, which combined represent almost 10% of annual global demand, Gurit is taking major steps to invest in India by setting up two additional manufacturing plants. This will create proximity, supply flexibility and provide a much increased level of competitiveness."

Prashant Kshirsagar

Director and Head of Sales of Gurit in India

New wind turbine production hubs

Several wind turbine makers have set up manufacturing facilities in India and have introduced the latest-generation turbine models. Since 2007 Gurit has been operational in India from facilities based in Pune, with a strong field workforce for servicing the wind energy market with both tooling and composite materials for wind blade producers and repairers. Specializing in advanced composite solutions for the wind turbine manufacture and repair industry, Gurit already has many established wind clients both in India and globally.

These market opportunities further strengthen Gurit's competitiveness and contribute to further promoting sustainable energy solutions.

Gurit has recently announced that, by the end of 2021, it will install a new PET extrusion plant in India, kitting facilities in the North and South of India as well as a tooling production site for wind blade molds. These significant commitments reflect Gurit's support of this thriving wind energy market with state-of-the-art, modern facilities in the country.



What trends do you see in the Wind market in general and considering the current economic environment?

"India and new markets with a lot of potential are growing. It is an exciting time to be involved in the wind energy sector! Over the past five years, new solutions and larger rotors reduced the Levelized Cost of Energy (LCoE) of renewable wind power. The speed of this development is constantly increasing. Driven by the longer blades, we are seeing a fast transition to use PET and towards split blade technologies. I also believe that governments will speed up the transition towards renewable energy sources. To ensure continued success of this development, we must do our best as a supplier to the industry to reduce LCoE. In the core kitting part of the business I am responsible for, we excel at developing kits that improve lay-up time, reduce material use, and create a stable and repeatable infusion flow for our customers."



Andreas Kipker
General Manager Kitting Business Unit



Bing Chen
General Manager Tooling Business Unit

What are our strengths in the market?

"Gurit offers a wide range of solutions to the wind blade industry. Building on the knowledge from across product ranges, we can challenge ourselves to always be frontrunners in terms of technological development. At the Tooling business unit we continue to drive innovation with further automation solutions to improve performance and cycle times. With the wind blades becoming longer, real estate, materials movement and production facilities have grown in size as well. To balance out these additional costs, we need to reduce the cycle times. And this is exactly what we are doing with our innovation efforts for the wind blade molds and blade making processing equipment. Together with strong engineering teams as well as an excellent field technical support and installation workforce, we will continue to provide value and support the transition to clean sources of power generation."

"Gurit's offering is unique, as we provide tooling for the wind blade mold, a wide range of advanced composite materials, the core kitting services as well as repair solutions to maintain and extend the wind turbine blades' life time. Now we are especially looking forward to expanding our footprint in a promising market such as India, to adding local extrusion capacity and implementing our co-location strategy to demonstrate an efficient collaboration with kitting services. I am very much looking forward to also following and supporting our customers in this part of the world."



Ernst Lutz
General Manager Wind Materials
Business Unit

Co-location of core materials and kitting operations

Reducing cost, waste and transport emissions

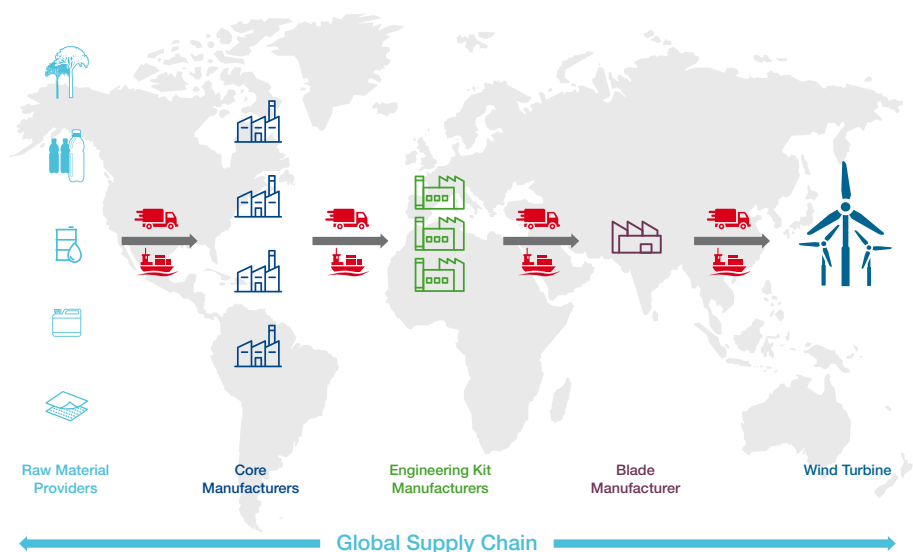
One of the key aspects that are making the wind energy sector so successful today is the scalability of the technology, especially in terms of blade size. Enormous developments have been made in the field of wind turbine construction. The largest turbines are approaching the height of the Eiffel tower as blades are getting longer and rotor diameters now reach the 200-meter mark. This is not only impressive from a constructional point of view, it also has a significant impact on performance. These larger turbines capture and transform more energy during their lifetime, ultimately resulting in a substantial cost reduction for the electricity produced – the

so-called levelized cost of energy. As cost parity with fossil fuel-based power generation has now been reached, wind farms have become competitive and economically viable even without government subsidies. Wind has therefore become one of the largest sources of clean, renewable power.

Gurit's co-location strategy

As a supplier to the wind turbine market with wind blade tooling, composite materials and core kits, Gurit contributes along various steps of the value chain with continuous improvements and innovations to further reduce the overall cost of wind power – all while maintaining or improving

Traditional raw material to turbine supply chain



"On the wind industry sustainability path, many avenues will be explored and deliver improvements. Gurit's co-location model presents both advances in further reducing greenhouse gas emissions, but also makes total cost improvements to support the Industry."

Mathieu Cariou

Director Strategy & Business Development Wind, Gurit

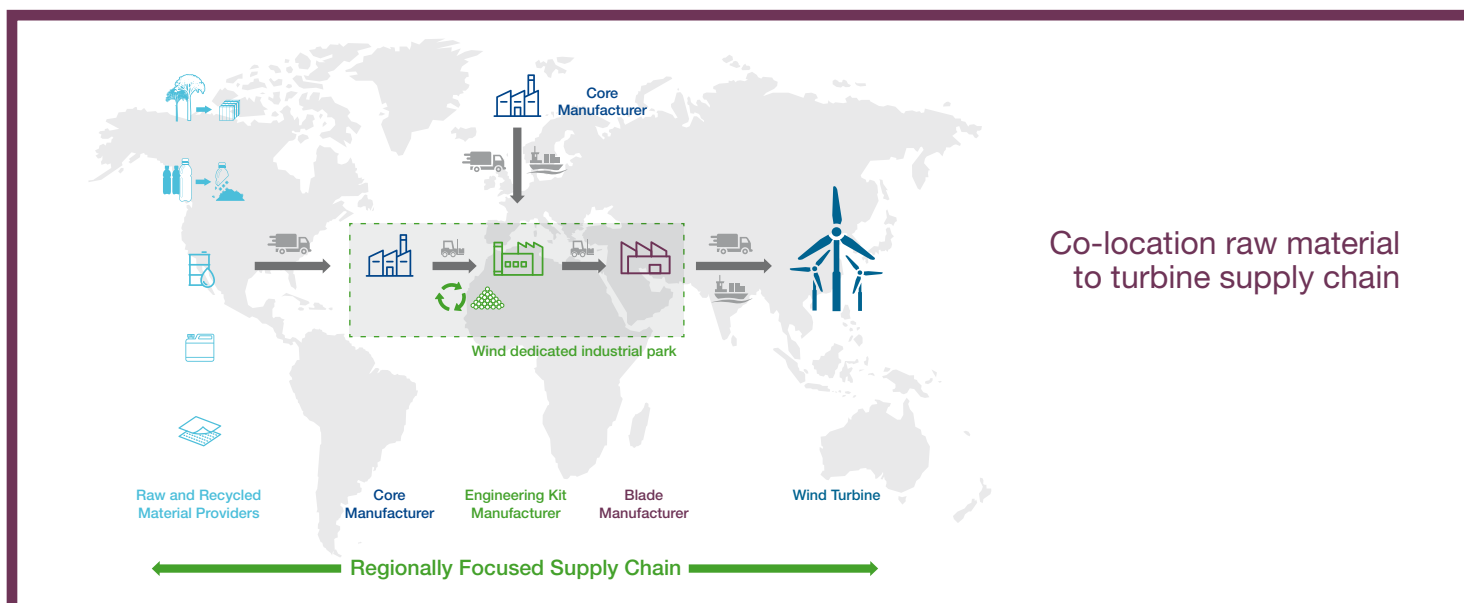


properties. Co-location is about reducing transport emissions, storage space, time and allowing for significant recycling of raw materials. The recipe is simple and effective: PET core material production sites, with so-called extruders placed in the vicinity of kitting operations. Instead of weeks of sea-freight or long truck journeys, the locally produced Kerdyn Green PET structural foam cores are transported to the kitting factory next door – a five-minute journey using a forklift. This represents a huge reduction in transport emissions and the material can be processed much faster, speeding up the entire supply chain. Also, instead of keeping large stocks at two sites, these can be reduced, dynamically optimized and managed. The product properties remain the same at all sites globally, so

in the event of a local shortage, the material can be sourced flexibly from another site.

Recycling of waste PET core material

A second important aspect is that the proximity allows for the core material leftovers from kitting operations, in the form of PET dust or cut parts, to be fully recycled back into the extruder operations. This saves further truck journeys and prevents landfilled or incinerated waste by simply recycling it into the production process. This is a great example of how sustainability is at the very heart of our daily operations here at Gurit.





Efficient wind turbine repairs

The wind turbine repair industry is growing due to the high number of existing wind turbines approaching an advanced age in their service life and in need of more frequent maintenance.

It is vital that wind farms are kept in optimum working conditions to ensure they are running at the highest energy generation capacity. Furthermore, these increases in efficiency streamline costs for the turbine owners and supply more energy back to the grid. For these reasons, regular preventative maintenance is commonly carried out, increasing the demand for materials and repair solutions for on- and offshore wind turbine generators around the world.

Maintenance extending the service life

Wind turbines are typically designed for a service life of around 20 to 25 years. During this time, maintenance and repair procedures ensure the ongoing structural integrity of the wind turbines and prevent catastrophic failures. Problems need to be detected and repaired as fast as possible to keep downtime to an absolute minimum.

According to CompositesWorld.com, an out-of-service turbine can cost between USD 800 and 1600 per day, with most repairs taking one to three days. If a crane is required to repair or replace a blade, the cost can run up to USD 350,000 per week. An average blade repair can cost up to USD 30,000, and a new blade costs, on average, about USD 200,000.

Major corrective maintenance could be the replacement or repair of the gearbox, the main shaft, generator, bearings or one of the rotor blades. Blade damage can occur from handling, installation, weather conditions and environmental impacts. Deterioration during operation is most common, with lightning strikes, debris, wind and constant temperature changes battering the wind blades, causing blade surface



erosion, critical bonding areas to start separating or even more compromising damage to the composite structure. Any of these critical components will likely render the turbine inoperable for some time and the current repair solutions are critically impacted by temperature and humidity, reducing the repair teams' access to the turbines throughout the year.

Repair time reduced from two days to four hours

Efficient repair solutions contribute to minimizing downtime, for example through materials availability, processing and applied properties. Gurit has a range of OEM qualified & certified, low toxicity epoxy materials for all in-factory blade finishing and repairs including laminating and infusion resins, fillers, adhesives and gelcoats.

Building on its in-depth understanding of the materials from which wind blades are made, Gurit has developed new technologies and dedicated solutions for in-field maintenance that act to extend the life cycle of wind turbine blades. Gurit offers a wide range of products available in two curing techniques: thermal & UV light. For example, the Ampreg™ low toxicity, thermally curing laminating system, is supplied in a range of dispensing solutions and small packs, ideally suited for use in challenging situations.

Gurit's UV-curing technology-based RENUVO™ moves from a two-day operation using thermal solutions, to a four-hour operation using a new generation UV lamp. This saves on up-tower trips, allows covering several repairs in less time and reducing cure time from hours to minutes. The added health and safety benefits include less systems handling and limited risk of spillage. Modern UV lights have become compact and lightweight, so today UV-curing is an attractive option for both in-field and in-factory repairs.

Gurit wind blade repair portfolio

- Ampreg™ Laminating
- PRIME™ Infusion
- Filling & Fairing
- Spabond™ Adhesive
- Gelcoat Repair System
- UV-Curing RENUVO™

The repair portfolio applies to a wide range of repairs, from blade-finishing or bonding of ancillary or retrofitting of parts, either in the factory, where the de-molded blade can require some finishing, or repairs to in-field situations on the turbine in operation.



A dedicated team at Gurit consisting of technical specialists, product developers as well as a worldwide distribution network with dedicated partners is being built up to address various stakeholders' needs. For more information, contact our Wind Repair Sales Expert klavs.weis-fogh@gurit.com

"With an increasing share of wind rotor parks now reaching an advanced age, the industry is looking at solutions targeting increased average operation efficiencies as well as extending equipment life. Our experience across all aspects of the blade manufacture makes Gurit the prime partner for OEMs and wind park operators for the development and delivery of solutions during the whole blade life."

Mathieu Cariou
Director Business Development Wind, Gurit

Next-gen aerial fire suppression systems



Helitak is a firefighting specialist, designing and manufacturing rotary aerial firefighting equipment. With well over a decade of research and development, Helitak has developed an efficient, compact, reliable and cost-effective fire tank, constructed with advanced composite materials from Gurit.

Helitak's CEO and Chief Engineer, Jason Schellaars, is a helicopter firefighting pilot. As a commercial pilot and engineer by trade, Jason identified the need for a user-friendly, easy-to-install, all-in-one plug and play fire suppression unit for use in the helicopter industry. He is supported by an expert team and together they ensure consistently high standards of innovation, design and manufacture.

Helitak has been operating since 2006 and the first commercial Helitak Fire Tank was exported to the United States in 2007. The Helitak Fire Tank was also featured on the Australian Broadcasting Corporation's "New Inventors" TV show in 2009. The tank design was the clear winner and collected the people's choice award.

Custom-built fire tanks

The underbelly fire tanks are custom-built for each make and type of helicopter, with a carrying capacity ranging from 1000 to 10000 liters (250 to 2645 US Gal). The top section of the tank is constructed from carbon fiber with a Gurit Corecell™ M foam core, infused with Gurit epoxy resin Prime™ 27, and the design is such that no modifications are required to the aircraft. The extendable bag is manufactured from a specially sourced, heavy-grade, hard-wearing and tear-resistant vinyl material – rated to 15 tons. The tanks have built-in compartments housing the electrical systems, microprocessor control unit, hydraulic components as well as the foam dispensing tank and pumps. Fail-safe door operation allows the doors to open following a loss of power. Drop sequencing can be variably controlled by the pilot from the easy-to-use cockpit controller.



Black Hawks attacking wildfires

The Australian-made Helitak FT4500 Black Hawk aerial firefighting tank is a 450-litre-capacity aerial suppression system installed to the underbelly of the Sikorsky Black Hawk helicopter. A predominantly carbon composite shell provides the structural integrity of Helitak's newest tank to hit the global market.

Helitak completes load testing to 4.4 g of the Design Limit Load, around 20,000 kgs, on the tank shell to pass the strict international aviation certification regulations.

Helitak has a range of tanks to suit the most popular helicopters commonly used in fire suppression and have expanded their product line to include a range of high-volume hover pumps and a micro-processor controller unit and mapping systems.

"Helitak chose Gurit to partner in our very important supply chain to provide a range of consistent-quality composite materials. So we can confidently stand by our product range and boast being the best 'next-generation' fire tank on the global market to help combat the growing bushfire and wildfire problems our planet is experiencing."

Paul Blundell

Operations Manager Helitak Firefighting Equipment PTY LTD



Supporting a young British sailing team preparing for the Olympics



Gurit is pleased to announce a partnership with the Mastfell Sailing Team as they prepare for the 2024 Paris Olympic Games, participating in the 49erFX class. Members of the British Sailing Team, Alice Masterman and Bella Fellows hold national championship titles and continue to coach while training.

"We are honored to be supported by a company with such a successful history in the marine industry and an ongoing commitment to sustainability. This partnership with Gurit will allow us to dedicate even more time to training and let us focus on our ultimate goal."

Alice Masterman, Mastfell Sailing Team

Lance Hill, General Manager of Gurit's Marine/Industrial Business Unit, states: *"It is our pleasure to support the next generation of sailors and it underlines our long-standing experience and dedication to the boatbuilding industry, both in the UK and worldwide."*

The team's commitment to their ambition is impressive. Not only are they intent on their Olympic training, they are also attentive to the environmental needs of the locations in which they practice. Alice Masterman tells us: *"In the build-up to a competition, we like to arrive at the venue a few weeks in advance, have a solid training camp and then take a break and remove ourselves from the venue. This way, we can come back to the venue refreshed and with a clear mind and in regatta mode. It's vital to be prepared with a list of spares, ready-made sheets & halyards and a toolbox with everything in it. Gurit have provided us with a package that ensures that, if we ever have a collision or breakage to our hull (touch wood we won't have to use it!), we can make a quick repair to get out that day or to make sure we are all good to go the following day."*

Part of our volunteering as an athlete representative includes beach clean-ups which have become a regular event at big sailing competitions. All the competitors will join together to partake in a beach clean and help show the surrounding community that we plan to leave a clean footprint when we leave – encouraging them to treat the beach with the same respect."



Upcycling composites into innovative interior design



From wind turbine blades to exclusive furniture

When a wind turbine has provided energy for its entire lifecycle, one significant challenge remains. It is the complex task of taking care of the waste that is no longer an operational wind blade. To get closer to solving this issue and finding a second life, an innovative mindset is required. An inventive example is what MM Composites does.



Polishing a table plate produced from recycled composites



Marc Dullum
Project Manager, MM Composite

They have found a way to reuse materials from wind turbine blades to create uniquely styled furniture. No piece is like any other and the initiative supports the growing trend of recycling and reusing different materials.

MM Composite is a global company based in Denmark, which manufactures high-quality composite products for the wind industry.

A major inspiration for the development of these distinctive furniture pieces was the interest for the circular economy and recycling. The project started with in-house experimenting with fiberglass and left-over material from their wind industry production. The result is a range of “Exclusive Table Plates from Recycled Fiberglass”. This initiative proves that, with the right mindset, you can create new ideas and move forward. However, the ambitious goal of fully reclaiming and recycling polymers and fibers from the turbines on a larger scale is a challenge yet to be solved.

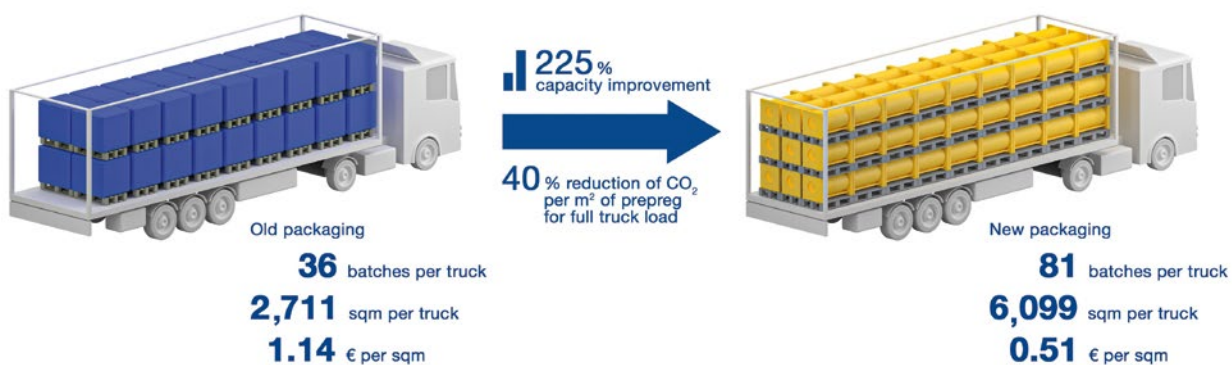
Sustainable packaging

A more compact layout and lighter packaging materials reduce CO₂ emissions

As part of Gurit's commitment to decrease emissions and enhance sustainability in all operations, a re-design initiative to establish an improved packaging solution for preimpregnated fabrics (prepreg) materials has been undertaken. Prepregs are typically transported in large rolls and the new packaging solution drastically increases shipping efficiency. This is achieved by reducing the volume of the packages and therefore enabling larger quantities of the products to be fitted into a container or truck, consequently decreasing the number of transports required for the same product quantity.

When shipping by truck, 45 more rolls/boxes can be accommodated in a full truck load, allowing for a 40% reduction in CO₂/m². This smart improvement benefiting customers and our environment illustrates Gurit's ongoing commitment and passion for a sustainable future.

By applying this principle and utilizing the new packaging model rather than the current one when shipping by sea freight, a 50% reduction in greenhouse gas emissions per square meter of prepreg fabric transported can be achieved. The new packaging allows for 36 more rolls/boxes to be fitted into a regular sea freight container.



World's first electric, zero emissions racing yacht 'J-Bird III'

A restoration project of one of the world's first elite racing yachts, 'J-Bird III' is underway by new owners Ian and Annika Thomson from Ocean Crusaders, an environmental Conservation Organization based in Queensland, Australia.

J-Bird III is approaching 20 years old and is one of the world's first of the Transpac 52 sailing class that went on to become the grand prix standard of inshore yacht racing across Europe. The Transpac 52 (TP52) is a class of yacht used for competitive 52 Super Series yacht racing. J-Bird III was designed by Alan Andrews Yacht Design. It was originally launched in May/June 2001 and was one of the top two scoring TP 52's in the inaugural season.



Restoration process

The yacht is now undergoing an extensive core refurbishment with advanced materials and engineering services by Gurit. The objective for J-Bird III is to become the first electric-powered, zero-emissions TP52 racer/cruiser, and to be back racing in some of the biggest races in Australia. The refit plan was to cut the front half of the deck off and replace it with a new profile. Then the cockpit and rear side decks would need to be re-cored using Gurit core materials, Gurit Ampreg 31 and Prime 27 resin systems. The coach house and foredeck will be replaced using a structurally engineered Gurit Hi-Panel, an infused composite panel solution that will be delivered direct as a kitset, CNC cut to shape and ready to be fitted on-site.

The reason J-Bird III was so attractive to the new owners is that they wanted a fast hull. They also wanted head room, since Ian is 6'4" (193 cm) tall. There simply wasn't a fast race boat from old days or more recently that was within their budget and had the headroom required for both racing and comfortable cruising around the Pacific. Therefore, finding a boat on which the deck needed replacing was perfect.

Following the completion of the restoration,

J-Bird III will spend 18 months campaigning in Australia's biggest yacht races including the Rolex Sydney to Hobart, and then a fully crewed Around Australia World Record Attempt to promote zero emissions sailing and the need to look after our oceans. After the racing campaign, she will head to the Pacific to help educate islanders on the issues plastics cause to our oceans and how it is impacting 'Island Life', with a particular focus on the effect to the islanders' main food source, marine life.

A passion for the ocean

The owners, Ian and Annika Thomson, are both commercial skippers and founders of Ocean Crusaders, a charity organization that specializes in cleaning Australia's waterways, reusing and recycling much of what they recover. The Ocean Crusaders entire campaign is run with a passion for the ocean having seen the issues wildlife is facing first-hand. So salvaging an elite race yacht and providing J-Bird III with her second wind ideally reflected their passion for sustainability.

"Ocean Crusaders are dedicated to looking after our oceans, and what better way than to 'recycle' a race yacht that was destined for scrap. With a motto of No Emissions, No Compromise, the campaign will turn to an electric engine, yet will race at the front of the fleet. We chose Gurit since they were the original engineers on the project. However, the sealer was their recycled PET core that we could use to replace rotten interiors and their environmentally friendly Bio Resins."

Ian Thomson
Founder/Managing Director Ocean Crusaders





Ian and Annika Thomson

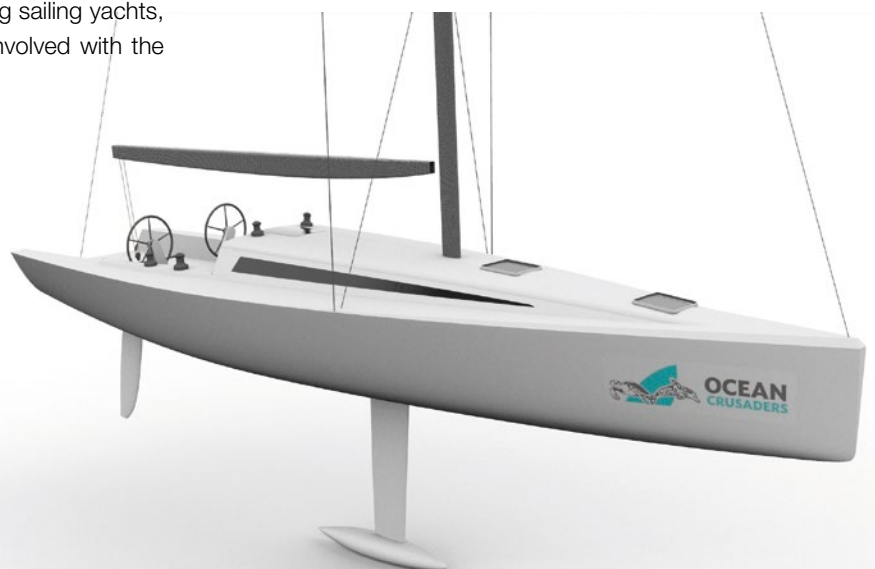
The Transpac 52 Design

The TP52 is a simple racing machine. No moving parts under water other than a single centreline rudder, no complicated issues on deck or in the rig. Just high-quality components allowing proper control of the boat and a sail wardrobe build for optimum performance at every wind angle and windspeed. The TP52s are true grand prix racers, designed and built to withstand the abuse of yacht racing at the highest level, with highly optimized structures ensuring excellent performance.

The original designer Alan Andrews, who specializes in creating high performance racing and cruising sailing yachts, is a long-term customer of Gurit and was involved with the new deck design.

Founded in 1979, Alan Andrews Yacht Design incorporates a philosophy of high-performance sailing characteristics combined with solid, state-of-the-art engineering. The net result is a well-found yacht with a competitive lifetime outlasting current racing rules.

Gurit's long design heritage with racing yachts and light-weighting for marine has played an important role within this refit project, and the original laminate drawings and calculations were all on hand to help achieve these extensive modifications with confidence.





Ocean Crusaders CAPS CRUSADE

Ocean Crusaders is working on a program to ensure that plastic doesn't end up in the environment, by collecting plastic caps and finding ways to re-purpose. At their collection locations in Queensland, they receive up to 300,000 plastic bottle caps a day! From there, the caps are sorted, granulated and made into new items such as Crab Pot Floats that will eventually replace Polystyrene Crab Pots that break up and litter our waterways. Ocean Crusaders are also looking to make plastic bricks out of all the remaining granules. These bricks will each contain 1.5kg of plastic – approximately 600 bottle caps – and can be used for non-structural things like bike shelters, bus stops, seats and cubby houses. The bricks will eventually be sold, and the funds raised will help fund the OC cleaning operations.



Watch the full story on how to make a recycled brick from 100% plastic waste here:

 www.recyclerebuild.org/recycledbrick

Sustainability Award

Ocean Crusaders recently won the Queensland Sailing Sustainability Award at this year's Queensland Yachting Awards night for their campaign in the 2019 Sydney to Hobart where they conducted a clean-up in the harbor before the race.

Find out more about Ocean Crusaders and their recycling efforts by visiting:

 www.oceancrusaders.com.au





Sustainable forestry in Ecuador

Tropical deforestation is a significant source of carbon emissions. It is estimated that the earth's remaining tropical forests house 250 megatons. If

Therefore, the big question is how do we change behavior – from local communities to international value chains – to keep the earth's tropical forests intact? How do we raise the value of forest enough so that it influences people's relationship to it? If we consider that forests are a requisite to our continued existence on this planet, then forests are profoundly undervalued. How do we change the equation? This is the question that Whole Forest is working on.



Balsa factory, Ecuador

we lose this remaining forest and release this carbon into the atmosphere, the earth will experience catastrophic change. Likely, no amount of renewable energy and reforestation can save us if we simultaneously lose our tropical forests.





Whole Forest is a mission-driven forestry enterprise that started in Ecuador in 2003. The company partners with forest communities to reverse tropical deforestation by building robust rural economies based on the long-term management of highly threatened native forests. Whole Forest is creating a new market mechanism for tropical forest conservation by offering its clients beautifully designed tropical hardwood products combined with a large carbon offset based on the avoided deforestation, which they achieve through their intervention. Whole Forest is an activist brand that provides its clients with an emotional connection to nature and an opportunity to take on an active role in mitigating climate change. Essentially, Whole Forest is creating a new value chain for tropical forests that helps conserve rainforests and provides a large carbon offset.

Whole Forest's conservation strategy is based on creating a community forestry and wood products supply chain that drives more value back to communities from conserving their forests, than they get from converting their forests to agricultural activities like oil palm, cattle, cacao, and others.

Whole Forest has two lines of intervention:

One, the company works with local communities to put highly threatened native forests under long-term forest management to keep those forests out of the path of deforestation. Whole Forest manufactures flooring, tables, and other architectural finishings for the international green building

Balsa, a wood with excellent properties

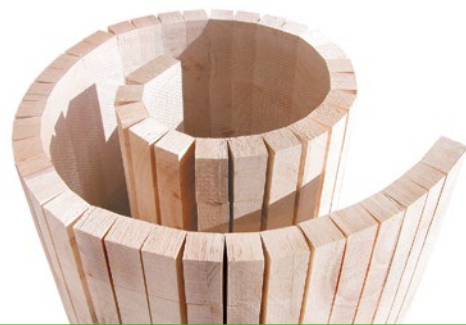
Because balsa wood is low in density but high in strength, it is preferred for use as core material in the composites industry; most notably, the blades of wind turbines. Balsa lumber is very soft and light, with a density from 40–340 kg/m³, and a typical dry density of around 170 kg/m³ to 190 kg/m³.

How is balsa grown?

Balsa is known as a pioneer tree species, which means it is one of the first tree species to sprout naturally when there is a soil disturbance or clearing in the forest. Balsa trees do not grow in the old-growth native forests, but rather in the disturbed forest landscape around native forests on the agricultural frontier. Most balsa wood comes from small landowners and rural families living in the agricultural frontier landscape.

Balsa's native range is from Central to South America. However, Ecuador's location and unique climate create the perfect conditions to give Ecuadorian balsa the best physical and mechanical properties for the composite industry.

As a pioneer species, balsa's biological function is to provide protective cover so that other vegetation can grow. This is why balsa is so fast-growing and its wood is so amazingly lightweight. Given balsa's rapid growth, it also has a short life span, living between 20 to 30 years, although the composite industry prefers balsa around five years old.



market. Furthermore, Whole Forest offers its clients carbon offset based on the avoided deforestation within its area of influence of roughly 50,000 hectares of highly threatened tropical jungle in the Ecuadorian Choco in northwest Ecuador.

Whole Forest's second line of intervention is to establish and manage balsa plantations with local families and manufacture laminates for Gurit's global composite supply chain. Through this intervention, Whole Forest has grown to employ 100 community members in forestry, manufacturing, and business administration and works with over 400 small providers.

Opportunities for a green value chain

Interview with Garrett A. Siegers, CEO and Co-Founder of Whole Forest



Garrett A Siegers
Co-founder & CEO

Garrett has led the growth of this social enterprise from a community project to become a globally unique and scalable conservation-business model. Previously, Garrett managed several carbon sequestration projects for Conservation International and has worked as a forestry consultant for different organizations including the United States Forest Service. He has received several awards and recognition for his work as a social and environmental entrepreneur. Garrett holds degrees in Economics and International Relations.

What can the industry further do to address climate change?

There is an enormous opportunity sitting in front of us to create a climate-positive impact in the wind energy value chain by strategically connecting the top and bottom of the supply chain. I suggest the following model as a big opportunity:

- Create a deforestation-free balsa supply chain by only establishing plantations in sites where no forest was cleared.
- In parallel, develop a project of native forest restoration, with a 1:1 ratio.

This kind of program would create a fully sustainable raw material base on the bottom end of the supply chain that would address both the balsa supply required by industry, ecological conservation, and carbon emissions from deforestation. The outcome of this green value chain would be a very powerful additional sustainability driver for the balsa and wind energy supply chain. And it would be of great interest to wind energy utilities, like Orsted, that are focused on making sure the global economy gets to Net Zero emissions by 2050 to protect the climate.

Why did you pick Ecuador to grow your business?

It might be more accurate to say Ecuador chose me. When I came to Ecuador, I managed reforestation projects for carbon capture for corporate funds for the voluntary carbon market. I found that no amount of reforestation would be able to mitigate a pending climate disaster if the world's remaining tropical forests were destroyed. I observed that agriculture, far more than anything else, was the driver of tropical deforestation. It became apparent that the world's value chains were not accounting for the negative externalities caused by the unmitigated push for expanded agriculture. Therefore, in economic terms, the only way for the forest to withstand the incentive to convert the land to agricultural was to raise the value of the forest so that they could compete with the opportunity cost of converting to agriculture. And this is how Whole Forest was born.

Do you have plans to replicate the same model in other areas?

Our immediate focus is on working with communities on the coast of Ecuador to address deforestation. To expand, our strategy is to partner with other community-based organizations or forest products companies to adapt our business and conservation model. We are an open-source company, which means we welcome others to apply and adapt the Whole Forest model to make forestry value chains more sustainable.

Whole Forest is working through a seven-year partnership with Ecuador's Ministry of Environment as a model for community forest management. It is the first private initiative to be included as part of the country's UN REDD+ Action Plan to reduce deforestation per the country's commitments through the Paris Climate Accord. Through both of these mechanisms, there is an expectation that Whole Forest will expand to work with other groups to help bring more threatened forests under management.



Lead forester, Darwin Rosero, delivering Balsa saplings to local community women



Whole Forest flooring

Balsa & sustainability

The question about the sustainability of balsa is being asked frequently. Most balsa wood comes from small landowners and rural families on the agricultural frontier, where agriculture is pushing up against and displacing native tropical forest. Balsa wood is a wonderful source of income for these rural communities. Nevertheless, in terms of sustainability, the challenge is to prevent balsa from being a driver of deforestation.

Balsa trees are not found naturally in old-growth native forests. Rather, the concern and challenge is that native forest is cleared to plant balsa plantations. As the global demand for wind energy has grown, rural communities are planting more balsa. This demand for balsa will inevitably create conflicts between the need for balsa raw material and the conservation of native forests, leading to biodiversity loss and significant carbon emissions from clearing intact tropical forest.

At the same time, the world's value chains are aggressively moving toward decarbonizing. One example in the energy sector is Orsted, the Danish wind installation developer. Orsted recently committed to reaching carbon neutrality in its own business' value chain by 2025. Orsted is actively looking for new supply chain partners for its wind energy business with a sustainability commitment.

The top end of the world's value chain is looking for innovations to drive down and reverse its climate impact. However, who is focused on the environmental potential at the bottom end of the supply chain? Is the top end of the value chain considering the opportunity of the impact of balsa production on local communities and the natural ecosystems in Ecuador?

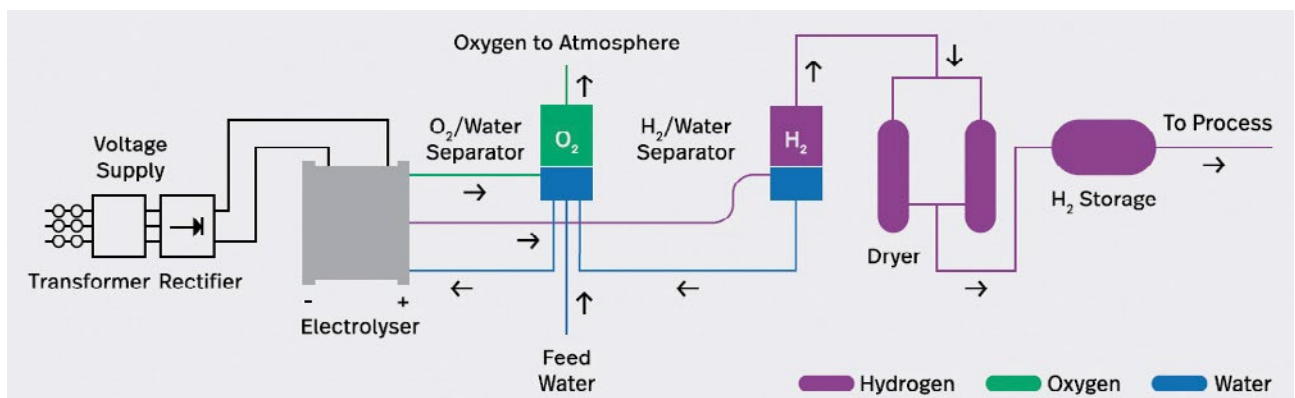


Green hydrogen on the way

As an energy carrier and viable solution to store energy, hydrogen has a promising future and the potential to play a deciding role in our planet's overdue transition to clean energy.

Hydrogen is the element with the highest energy density. Today's very competitive cost of electricity produced from solar or wind power, for example, is a major success factor for sustainable hydrogen production. However, hydrogen is only sustainable if it is so called 'green hydrogen', produced from clean renewable energy. In the past, most hydrogen production involved fossil fuels, generating extensive volumes of greenhouse gas emissions.

Today, most hydrogen available on the market is grey hydrogen. But with a shift to widely available, cheap renewable energy, the picture is changing, and hydrogen is looking at a bright future. "Hydrogen is today almost entirely produced from natural gas and coal," states a 2019 report by the International Energy Agency (IEA). As discussed in the last edition of SHAPE, hydrogen can also be used to effectively store energy produced from wind power, by generating hydrogen during peak wind hours with low demand from the grid, therefore acting as a buffer, and even supporting the transition from fossil gas by converting gas pipeline infrastructure into a hydrogen network.



Hydrogen electrolysis

Green hydrogen as a sustainable fuel

Green hydrogen	Electricity produced with wind, solar or hydropower is used to split water molecules and separate hydrogen.
Blue hydrogen	If hydrogen is separated from biomass, biogas, oil or natural gas this also generates carbon emissions that can be captured and stored. This process is called blue hydrogen with a lower or moderate carbon intensity.
Grey hydrogen	Grey hydrogen is produced with fossil fuels, emitting greenhouse gases. Often the applied process is Steam-Methane-Reforming – which is carbon and methane intensive. If coal is burned, this is sometimes described as brown or black hydrogen, an unsustainable form of hydrogen.



A hydrogen fuel truck

The hydrogen industry is fast-growing, facilitated by the recently-achieved cost-parity of renewable energy with fossil fuels. Hydrogen is likely to become a multi-billion-dollar fuel industry. Some countries are taking bold first steps. In October 2020, Spain announced a 10-year roadmap for green hydrogen as a clean fuel for air, road and sea transport. Spain plans to build 4 Gigawatts (GW) of hydrogen electrolyzers, splitting water molecules (H₂O) into hydrogen (H₂) and oxygen (O₂). The electrolyzers will be powered by abundant sources of renewable energy like solar and wind power.

Hydrogen can be burned, which generates heat in a furnace or engine, similar to oil or natural gas. The hydrogen can also be used in a “fuel cell” to produce electricity through an electrochemical reaction. In both cases, water is the only emission.

Hydrogen trucks in commercial operation

The Swiss Alps are a demanding environment for trucks. Korean manufacturer Hyundai chose this location to launch the world's first mass-produced heavy-duty fuel cell trucks. 50 of

its new trucks will be delivered by the end of 2020. The seven customers who received the first batch of XCIENT Fuel Cell trucks will haul payloads of consumer goods around Switzerland, emitting nothing but clean water vapor. The operations will be backed by a robust green hydrogen ecosystem and 100 hydrogen fueling stations across the country. The XCIENT Fuel Cell trucks feature high pressure storage tanks made out of advanced composites and have a range of up to 400 kilometers on a single charge. Hyundai's production capacity will reach 2000 vehicles in 2021. Visit hyundai-hm.com to learn more.

Fueling stations

The hydrogen economy is also growing from other angles. A good example is the Scandinavian company Nel Hydrogen. They are one of the suppliers to the hydrogen ecosystem in Switzerland and many other countries. The pioneering company provides solutions to produce, store and distribute hydrogen from renewable energy sources. Products include electrolyzers, and Nel's H2Station™ is the world's most compact fueling station, capable of fueling multiple types of vehicle and simple to integrate into conventional fuel stations.



Jens Egholt Rasmussen,
Senior Director Global Sales at
Nel's Fueling division, shares
his passion for hydrogen:

"Hydrogen is ideal in the sense that it enables fuel cell electric vehicles with the same fast fueling and long range as conventional vehicles today. The advances of energy produced from wind and other renewables enable us to switch to a green hydrogen economy with tremendous progress towards zero emission achieving our climate targets."

From bottle to boat



In 1845, John Brunswick came to America from Switzerland's Rhine Valley. A carriage-maker by trade, he opened a shop on September 15, 1845, in Cincinnati, where he was introduced to the game of billiards. A master woodworker, Brunswick began making his own tables, forming a recreational product company that is approaching 200 years in business.

Brunswick is now the world's leader in recreational boats, marine engines and marine parts and accessories, and is one of the longest continually publicly-traded companies on the New York Stock Exchange.

With experience comes understanding, and Brunswick has made a commitment to sustainability. It understands the impact its business can



have on the world and the necessity to lead the way in sustainable business practices. As such, it is committed to meeting its fiscal responsibilities while responsibly developing, manufacturing, distributing and servicing its products.

As part of this commitment to sustainability, Brunswick has begun the transition from balsa wood core used for added hull rigidity in many of



Kerdyn process

its boats towards Gurit's Kerdyn Green PET structural foam, made of up to 100% recycled plastic bottles. Several of its boat manufacturing facilities have completed the conversion, and the balance will be completed in the next year. When full conversion is complete, the replacement of its current core materials with Kerdyn in their boat production operations will consume the equivalent of over 4 million recycled plastic bottles and save 7,000 balsa trees annually.

Brunswick Boat Group's product line includes the well-known Boston Whaler, Bayliner, SeaRay, and Protector brands, and Kerdyn PET is used in structural core applications, decks and parts.





IMOCA 60s at the Vendée Globe race around the world



The 2020-2021 Vendée Globe showcases racing at its most challenging, as the only solo, round-the-world without assistance sailing event. In its eighth edition, the race features not only exciting new designs, but a demonstrated commitment to sustainability, with many of the teams partnering with environmental organizations to draw attention to the plight of ocean health. The race's spotlight on environmental issues makes it even more gratifying for Gurit to have provided engineering and/or materials to so many of the teams.

Gurit's engineering department has provided services to twelve of the teams in this year's race, and sixteen of the participants feature Gurit materials. From the 2000 Kingfisher, sailing this year as One Planet One Ocean, to the cutting-edge entries for Charal, Hugo Boss, and DMG Mori, Gurit is supporting a wide range of competitors and designs. The common thread? Performance.

The IMOCA fleet

The boats of the Vendée Globe all measure 18.28 m long (60 feet) and have a 4.50 m draft. With a large sail area, they are the most powerful monohulls on the planet led by a solo skipper. They can go beyond 30 knots in downwind conditions. The gauge of these racing animals is defined by the IMOCA class (International Monohull Open Class Association), founded in 1991 and supported by World Sailing, the International Sailing Federation. The biggest innovation in recent history was without doubt the addition of foils, appendices which allow the hull to lift in upwind conditions. This saves drag and enables better performance. The Vendée Globe 2016/2017 showed the effectiveness of this equipment. In 2020, a high number of contenders to the podium will be equipped with foils.



Gurit engineering expertise

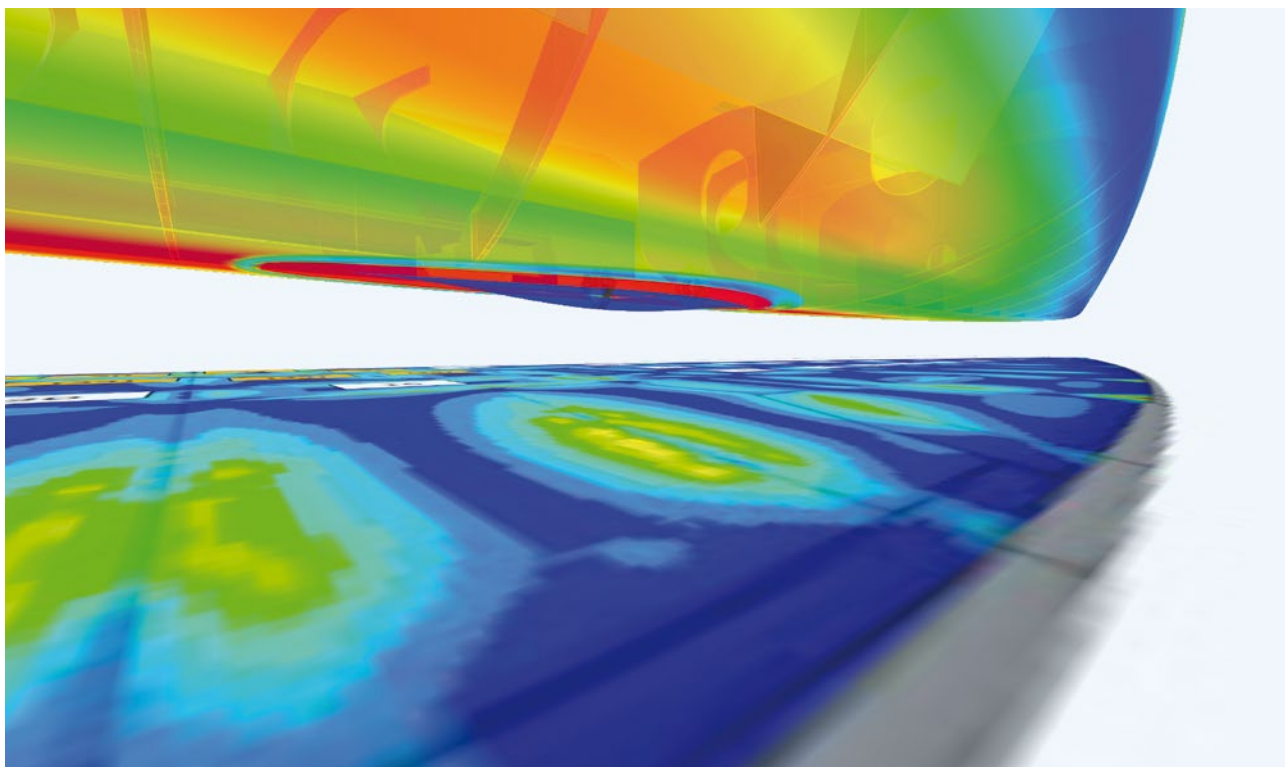
Gurit's engineering department has spent more than 6,000 hours on these various projects, always in full realization of the importance of a structure that can cope with such extreme performance. Given the company's long history of working on IMOCA 60s, Gurit has significant experience in the field.

Over the last 20 years, average speeds have increased by 30 per cent, with top speeds increasing by 50 per cent, while structures have become lighter. And as the push for performance continues, the current fleet will perform a balancing act like no other, challenging the laws of physics and defying conventional thinking of what it is like to sail a racing boat.

"The introduction of foils has changed load conditions, as the lee-ward foil works with the fin of the canting keel to lift the boat at speed," Gurit Principal Engineer Paolo Manganelli explains. "The structure around the foil is pretty complex and you've got a second major structural element to deal with on a similar scale to that of the keel. We're integrating the foil support structure into the keel support structure so that some of the elements are serving a double purpose in order to avoid adding more mass to the boats."



Paolo Manganelli
Gurit Principal Engineer



Structural engineers analyze the stresses in the hull of an IMOCA 60

Material choice is key

“As performance increases, slamming is another critical area and while Gurit’s Corecell foam has become the material of choice for the core in the underside of the hull, we have been able to further optimize its usage thanks to the improved understanding of its dynamic behavior. We have gained extremely valuable insight into the properties of Corecell at high strain rates through extensive testing performed by our New Zealand office in collaboration with the University of Auckland. Close collaboration with the teams is key to further improve our understanding of the new loading configurations that these boats are exposed to.”

Gurit’s technical sales manager Yannick Le Morvan agrees that working in partnership with the teams and their builders is critical to success. *“Collaboration is the key to moving these projects forwards,”* he says. *“The detail with which the modern designs are being built means that the whole exercise is a collaboration rather than the previous relationship where the partners may have simply supplied materials and/or data.”*

A good example of how this works in practice is the construction of a laminate and the precise way in which the fibers are laid. For a given area, we are now incorporating more layers that are thinner and arranged more precisely to achieve the best structural properties. As a consequence, cure cycles are also becoming more complex.

Teaching an old dog new tricks

Some of the efforts by Gurit Engineering were spent on upgrading and maximizing the performance of boats that were built in a previous generation of IMOCA’s. Upgrading an older design to accept modern foiling capacity required a different approach.

Gurit’s extensive history in engineering and providing materials for these spectacular boats will be on display around the world during the Vendée Globe, and we wish all the teams a safe and swift passage.

Post Scriptum

The unpredictable nature of a race such as this, including the increasing amount of ocean debris, can lead to participants being unable to complete the event. Following damage to his rudder, Alex Thomson / Hugo Boss were unfortunately forced to withdraw. We hope to see Alex in a future iteration of the Vendée Globe.

Longest wind turbine blade mold ever built



Gurit Tooling has a new record to celebrate! In November 2020, the team completed the longest wind turbine blade mold Gurit has ever built. The picture shows Gurit's Tooling team in Taicang lined up in front of the new mold, more than 100 meters long.

"The latest automation features help our customers reduce cycle times thanks to our reliable and innovative technology," states Bing Chen, General Manager Gurit Tooling.

Gurit is the largest wind turbine blade mold manufacturer worldwide. Since production started twelve years ago, the company has shipped close to 400 mold sets to the global wind turbine industry. With over 500 skilled employees based in China, Canada, Poland and at customer sites worldwide, this business unit is dedicated to the design, engineering, manufacture and service of composite tooling. Gurit is a prime engineering and sourcing partner for quality molds delivered to client specification in short lead times. In 2021, the Tooling business unit will further expand its geographic footprint and set up a new production site in the South of India.



"We were successful, together with our tooling team around the globe, proactively collaborating with our customer to design a tool in response to their technical requirements. We worked hard and it feels good to see the result of our work and ship it to the blade-making factory."

Yu Zheng
Site Manager Gurit Taicang



"Our engineering team spent more than 3000 hours on designing this large mold. I am proud to be part of a project that helps further improve efficiency and reduce the cost of clean renewable energy."

Lu Jialin
Engineering Manager



"We worked hard to build this large mold and successfully overcame big surface area manufacturing challenges."

Yao Weidong
Operations manager



"It has been a privilege to take on the challenge of building the largest blade mold in the world. Gurit's capabilities are on full display; our passion for safety, customer focus and quality are realized with this mold. This project shows that we continue to be the market leader in wind energy tooling."

Ethan Miller
Project Manager

Developing environmentally friendly technologies

Gurit is a member of the United Nations Global Compact. As part of this commitment, Gurit is encouraging environmentally friendly technologies. Gurit made and will make significant investments into a strong, sustainable core material offering. Gurit is also improving both health & safety as well as the environmental footprint of its formulated product ranges.



"We believe that by taking responsibility for the products we manufacture and their hazard profiles, we are able to not only improve the products we manufacture but also to engage throughout the supply chain. We do not believe that toxicity of chemicals is a trade-off with sustainable credentials; the two should be considered as of equal importance."

Amy Moram
Regulatory Compliance Officer at Gurit

Why have safer chemicals?

Chemical regulation became very significant a few years ago with the advent of regulatory systems such as REACH (Registration, Evaluation, Authorization of Chemicals) in the EU and Toxic Substances Control Act (TSCA) in the USA. Such schemes seek to identify and control the risks of harmful chemicals to the people and environment within their territories. A key part of REACH has been identifying and controlling Substances of Very High Concern (SVHC's). Substances such as these are deemed the most harmful due to the risk they pose to human health and the environment. As such, they are targets for restriction or authorization for use.

In recent years, the drive towards sustainability has meant that industries have placed greater importance on health and safety, and is switching to using lower hazard chemicals. Today, greater expectations are being placed on suppliers of chemical products to manage their harmful chemicals.

What is Gurit doing?

Gurit continually monitors and manages the risks posed by the chemicals it uses. Where feasible, the most harmful substances are removed from the product portfolio, going further than the requirements set out by regulatory bodies where appropriate.

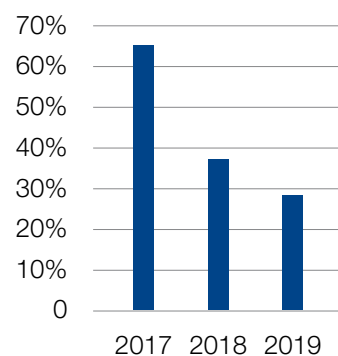


Gurit's Hazardous Chemicals Management Policy

The Gurit Hazardous Chemicals Management policy sets out Gurit's policy and process for managing such materials. It focuses on 4 key areas:

1. Assessing and avoiding high-priority chemicals
2. Hazard assessment and supply chain communication
3. Supply chain management
4. Sustainable chemistry

Gurit products with SVHC content > 0.1%



Avoiding high hazard chemicals

In order to avoid the use of high hazard chemicals, identification of such substances is key. Gurit developed a High Priority Chemical (HPC) score in order to identify and clearly compare the most harmful substances. The most harmful of substances are designated as red, lesser hazards are designated as orange, blue, then green. The score system can consequently be applied from raw materials through to finished products allowing a clear correlation between the input substances and output finished product. The scoring system is then used to focus and prioritize all reformulation efforts.



"The formulated product portfolio was complex and filled with legacy systems with a number of health & safety related issues. We are now in the final year of the formulated product rejuvenation project which started with Ampreg™ in 2018, then AMPRO™ last year and will be completed with PRIME™ & Spabond™ by the end of 2020. To date, two-thirds of the formulated portfolio has been replaced with safer, higher performing products and this will increase to over 90% by the end of 2021.

In 2021, we will have four great rejuvenated and sustainable product lines: Ampreg™, AMPRO™, PRIME™ & Spabond™. Our ecological approach to formulations is unique in our industry and something we are extremely proud of."

Kevin Cadd
Formulated Product Manager

Hazard assessment and supply chain communication

Communication of hazards is critical when supplying chemical products. Specialist software and automated processes allow for effective communication throughout the supply chain as well as within the organization. Robust review processes of supplier data and regulatory tracking systems ensure that the supply chain remains promptly informed of any changes.

Supply chain management

Gurit actively engages with suppliers to communicate the company's principles and policy on using less harmful materials. Through this, Gurit is able to work with suppliers on substituting the most harmful substances as well as ensuring new developments consider the use of safer chemicals. When selecting appropriate suppliers, hazard communication and regulatory awareness are fundamental to securing a good working relationship.

Sustainable chemistry

Considering sustainable chemistry means that many factors are reviewed, not only ensuring our manufacturing processes are as efficient as possible, but also considering bio-based options, use of recycle and minimizing material



wastage. Sustainable chemistry implies a fine balance between appearing sustainable and actually getting it right, looking at toxicity, health & safety, as well as transportation, sustainable supply chains and greenhouse gas emissions. There is a broad spectrum of sustainable options currently available, although many are still in their infancy. Selecting the appropriate, most sustainable option is not always easy. The growing generation of data such as life cycle analysis and carbon footprint analysis helps to make such decisions easier, but we are aware of the vast amount of work still achievable in this area.

Since the advent of REACH in 2008, the European Chemicals Agency has designated a total of 209 Substances of Very High Concern (SVHC's) to date. Of specific note to the composites industry was the inclusion of Bisphenol A and Nonyl Phenol. These substances are present in many amine-based hardeners and, although they can provide very effective technical benefits, the hazard profiles of endocrine disruption and bio persistence mean that removal of such substances is of paramount importance.

A key target set out by Gurit in 2017 was to remove all SVHC's from all Gurit standard and essential products by 2022. This is no small task given that the European Chemicals Agency are designating more SVHC's every year. The removal of such substances not only removes these harsh chemicals from the supply chain but also reduces reporting requirements for our customers such as those under new European waste reporting schemes in force from 2021. Gurit



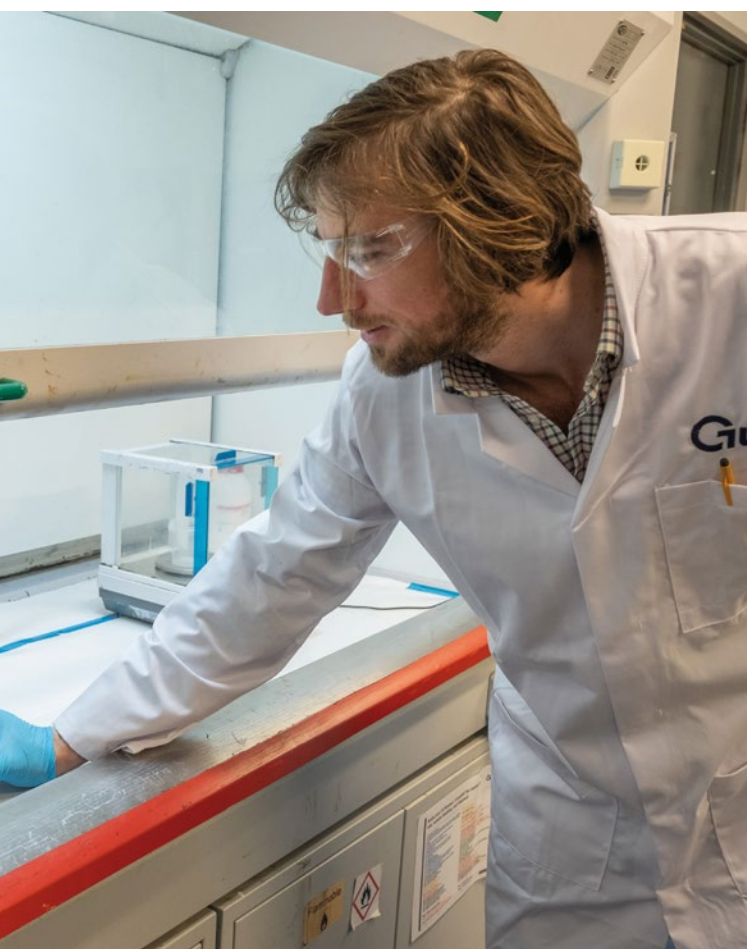
"I am proud that Gurit is removing the most harmful chemicals from the business and replacing these with safer ones. It supports and promotes our values, with Safety First and Sustainability."

Jason Rice
Manufacturing Manager Formulated, Gurit

is currently on track for this target with a large reduction in the number of Gurit materials affected – from 65% in 2017 to 28% in 2019*. By 2021, we expect this figure to be <10%.

Gurit's drive to reduce the hazard profile of products has resulted in a number of new product developments such as the SE90 and SE75 Prepregs, or the Spabond 800 and 400 range and the Ampreg 3X laminating range. These products also incorporate Gurit's unique Light Reflecting Technology, allowing the user to detect the presence of contamination on clothing and around the work environment in order to monitor exposure with the support of a simple UV light.

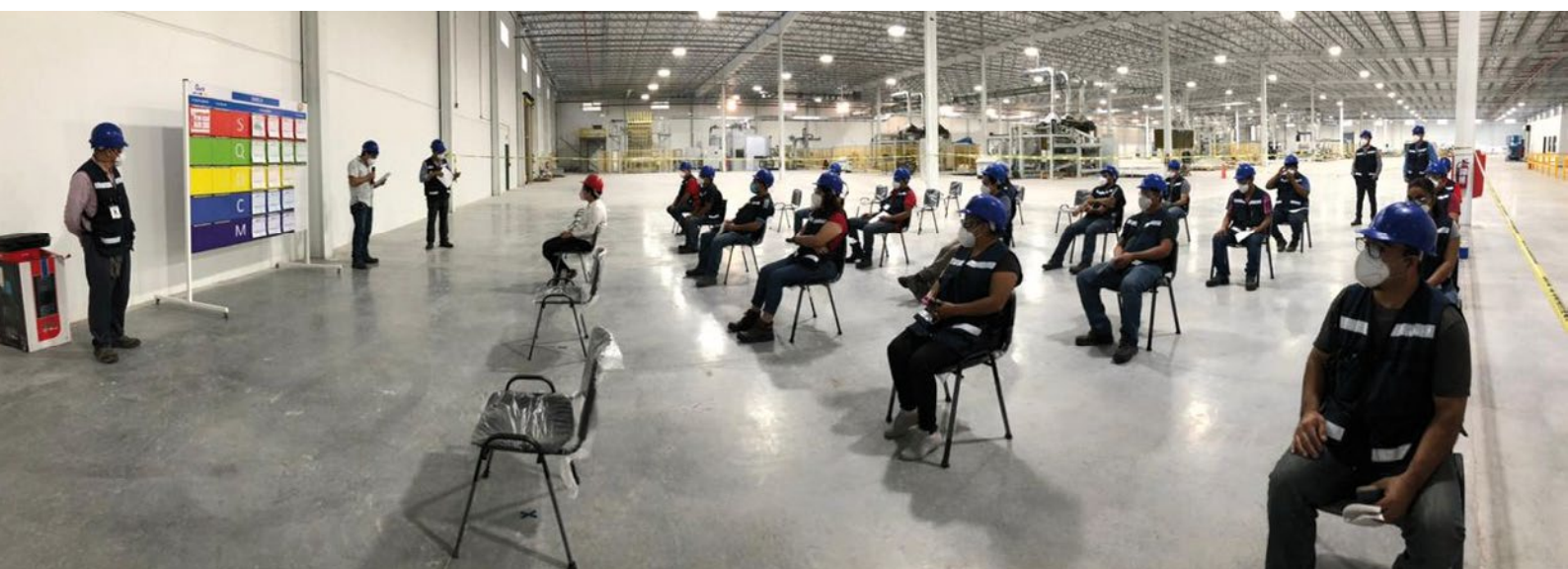
While much more work needs still to be done in controlling and substituting high hazard chemicals for safer alternatives, Gurit is well positioned to identify regulatory changes and additional hazard test data through its monitoring systems, and to pass innovative new developments in lower hazard chemical products to its customers.



* these figures include the number of products manufactured by Gurit covering Core, Formulated, Aerospace and Pre-preg products.

SAFETY FIRST

Placing safety at the center of our operations



Safety training at our new Mexican site

In July 2020, Gurit teams and sites around the world started conducting safety trainings as part of an enhanced safety initiative. The goal is to improve awareness, skills and reporting procedures in terms of workplace safety by focusing on how to practically implement and live the Gurit health and safety standards. A series of programs targeting different levels of the organization has been carefully developed and the company aspires to have zero work-related injuries and illnesses. To achieve and maintain such an objective, commitment and determination at all levels of the organization are required.

Training modules

The trainings are focusing on "Safety Walks" and "Incident Investigation and Reporting". The first round of trainings was held virtually. Local implementation at each site will follow as a next step.

Safety Walk – an interactive process

The Safety Walk revolves around a dialog and awareness process which aims to practically apply health and safety standards in work behaviors, and to train employees to actively observe and identify both unsafe and safe practices. The method encourages observation of the work environment from a different perspective and enables immediate mitigation of risks and recognition of best practices.

"Our Training program is helping us to proactively find solutions to reduce potential risks and to share examples of best practice with the rest of the organization. Our health and safety activities are helping us to create a workspace that is safe for all of us. We encourage your commitment and active contribution. Let us make Gurit a safe place."

Ernst Lutz

General Manager Business Unit Wind Materials



Safety First initiative roll-out in Mexico

Incident investigation and reporting

This module focuses on local Health and Safety standards, and encourages each employee to adopt them. By actively working with the standards and by having clearly assigned key responsibilities, the implementation of a health and safety culture in every part of the operations becomes a reality.

By now, several training modules with a number of different groups have been conducted, starting with senior management and cascading through the organization.

Continuous process and constant focus

After the first round of trainings are completed, sites are starting to implement the two standards, Safety Walk and Incident Investigation and Reporting for local managers and supervisors and subsequently for all employees. The response to the trainings has been excellent with a satisfaction level of 90%.

The Gurit safety training program



"Through the different exercises, discussions and role-plays that we carried out, we have been able to bring the theory of standards to the day-to-day operations of our factories. Our staff is showing tremendous ambition. I hope and strongly believe that, with continued effort and focus, we have a good chance of achieving our common goal. I am very satisfied with the result so far."

Hannes Haueis

Head of Group Human Resources



Gurit Services AG
Marketing & Corporate Communications
Thurgauerstrasse 54
CH-8050 Zurich
Switzerland
www.gurit.com

Follow us on

Linkedin: @Gurit

Twitter: @GuritGroup