AMBITIONS

A dive into Sika's world

AMBITIONSISSUE #26

BUILDING TRUST

EMERGENCE

ASTRID SCHNEIDER
Marketing & Product Communications Manager
Sika Services

In philosophy, science, and art, emergence is a process whereby larger entities arise through interactions among smaller or simpler entities such that the larger entities exhibit properties the smaller or simpler entities don't exhibit. In philosophy, emergence is often understood to be a claim about the etiology of a system's properties. Emergent structures appear at many different levels of organization or as spontaneous order. Emergent self-organization appears frequently in cities where no planning or zoning entity predetermines the layout of the city. The interdisciplinary study of emergent behaviors is not generally considered a homogeneous field, but divided across its application or problem domains. Architects and landscape architects may not design all the pathways of a complex of buildings. Instead they might let usage patterns emerge and then place pavement where pathways have become worn in. Building ecology is a conceptual framework for understanding architecture and the built environment as the interface between the dynamically interdependent elements of buildings, their occupants, and the larger environment. But the formation of new features or structures of a system due to the interplay of its elements can be found in all fields of our lives. For example, Sika Peru has established a hydroponic greenhouse for educational purposes (p.18). 30 employees from Production plus another 30 from Administration and Sales are actively involved in the project. New possibilities for self-harvesting healthy food have been identified, and the nutrition of employees and their families can be improved with crops high in iron, such as spinach or watercress.
Furthermore, construction of the biggest timber school building in the world (p.5) is creating a lot of new diversity and possibilities. Providing places for 800 pupils, the complex accommodates an elementary, middle and a high school. The building also includes space for non-governmental institutes and a sports club. The four elements together cover a total surface area of 9,700 m^2.
Elsewhere, Swiss artist Monica Jäger reflects on social housing utopias from the 1960s (p.41). Paying homage to the construction material used, she creates a complex configuration of plants evoking the shape of the original development and lending a novel form to new features.

Yours sincerely,

ASTRID SCHNEIDER

CONTRIBUTORS

SIRPA LUND
Marketing Specialist,
Sika Finland

The indoor air quality has become an important issue especially in schools in Finland. I am happy that we in Sika Finland are involved in our part improving the quality of school children, students and all personnel life with our flooring solutions. I'm proud of working in a company which provides high quality systems and products from roof to floor.

JANE RUEEGG
Marketing Manager Roofing, Flooring, KPM

Practical, durable, aesthetic, and easy to clean, but more important is that the floor surfaces are hygienic and slip resistant for safety reasons. These are the key considerations when specifying a flooring system in food and beverage facilities.

DR.-ING. DANIEL VOGT
Business Development Manager Industry Wind Energy, Sika Europe Management Ag

It is very satisfying for me to see how innovative solutions such as Sikadur WTG-1280 LD help our customers to continuously improve the production process of rotor blades

DIDIER DUVERGÉ
Sales Manager, Sika Mauritius

The Belle Mare Constance Hotel roofing project has been a technical challenge using a new sun-reflective Sikalastic. The project will stand as a milestone project for Sika Mauritius and will surely open new challenges in the cooling roof market.

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The building has already become a record holder in that it is constructed almost solely out of log timber or hirsi – a Finnish specialty – and is the largest of its kind worldwide.

BIGGEST TIMBER SCHOOL BUILDING WORLDWIDE

We are now in the city of Pudasjärvi, which is located in the province of Oulu in Northern Finland. The city itself has a population of 8,242 and covers an area of 5,867.24 km^2, 228.67 km^2 of which is water. The population density is 1.46 inhabitants per km^2. By area, Pudasjärvi is the second largest town in Finland and one of the largest in the world. Pudasjärvi is famed for its nature, and is the home of the southernmost fell area in Finland, Syöte.

TEXT: SIRPA LUND, ASTRID SCHNEIDER
PHOTO: JUHA NYMAN, CITY OF PUDASJÄRVI

> The city of Pudasjärvi decided to build a school campus which combines modern design with the local identity as well as supporting new ways of learning. The building has already become a record holder in that it is constructed almost solely out of log timber or hirsi – a Finnish specialty – and is the largest of its kind worldwide. The log timber came from a local company and the project employed local people, keeping the carbon footprint to a minimum thanks to the short transportation distances. During the construction period up until May 2016, international visitors flocked to the site from faraway places such as South Korea and Australia. The timber school has drawn so much international interest as a building site because its campus of four connected buildings makes it the largest timber lodge in the world. Engineers had to tackle a variety of construction challenges and solutions in terms of the material.

The proprietors of the building complex themselves say they are most excited by a particular group of visitors: the actual students who will receive an education within the walls of the record-breaking timber school. The Pudasjärvi timber building complex will be home to an elementary school, middle school and high school as well as a community college as of autumn 2016. It is to be maintained using what is called a life cycle model. Building firm Lemminkäinen Talo Oy will be responsible for the building's upkeep over the next 25 years, relieving the burden on the city community.

Key features of the building are its diversity and adaptability. For instance, the middle school classrooms are built around the lobby area and can all be combined into one large learning environment. The roofs of the lobby areas are supported by load-bearing beams because the wood in the walls will contract over the years. The contractor's rationale for using timber was to overcome the severe indoor air problems suffered in the old school. The >

Key features of the building are its diversity and adaptability. The middle school classrooms are built around the lobby area and can all be combined into one large learning environment.

Timber effectively balances the indoor heat and humidity conditions. The material is ecological, renewable and biodegradable.

The school has space for 800 pupils covering a total surface area of 9,700 m².

> walls in the new complex are solid wood, and the builders trust it will resolve any mold or air issues.

The school has space for 800 pupils. In addition to the various schools, the building also integrates space for non-governmental institutes and a sports club. The four buildings together cover a total surface area of 9,700 m². The city of Pudasjärvi wanted to invest in a healthy and modern multipurpose learning environment. Previous school buildings had indoor air quality problems, which meant the materials for the new structure had to meet strict indoor air quality standards.

The lobby and canteen facilities need to have a new, durable, easy-to-clean, low-emission and comfortable floor which does not contain PVC or softeners and can be applied without adhesives. The floor must also be resistant to high traffic levels as well. Architect office Lukkaroinen Architects Ltd chose Sika ComfortFloor® as the ideal solution for easy maintenance and comfort. The elastic and resilient Sikafloor®-330 coating was applied to the smoothed floor surface. After drying, non-yellowing matt surface coat Sikafloor®-304 W was applied on top for UV resistance. Staff at the facilities truly appreciates the floor

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system, commenting "your legs don't feel tired after a day's work, you really feel the elasticity."

The mayor of the city underlines that they chose timber as a building material as they had encountered huge problems with air quality in the past, and the lifecycle of concrete public buildings had been very short (only 30 – 40 years), compounded by the fact that repairs had not been sustainably successful.

Timber effectively balances the indoor heat and humidity conditions. The material is ecological, renewable and biodegradable. Natural clean wood reduces stress, generates positive feelings and has sound-deadening effects. This autumn, school will begin for hundreds of pupils. There are already rumors that a large number of them plan to study engineering because they are so happy with their new surroundings that they want to create timber buildings themselves later.

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1 The lobby and canteen facilities need to have a durable, easy-to-clean, low-emission and comfortable floor.

2 Previous school buildings had indoor air quality problems, so this one should be different.

WHAT ABOUT SPAIN?

Spain is an amazing country with its own unique culture and traditions. Travelling from North to South, visiting the biggest cities like Barcelona, Valencia and Madrid, you also come to know and love all the small villages with their historical architecture and friendly people.

TEXT: LUIS CARLOS GUTIERREZ, ASTRID SCHNEIDER
PHOTO: SIKA SPAIN, ISTOCK

The small Andalucian alleys are charming and invite to have walks. Though finally it is easy to loose orientation and get lost...

Barcelona is one of the city highlights of the country.

Tapas is the food Spain is famous for and in every region you will find different specialities.

The Meditaranean Sea, the Street of Gibraltar or the Atlantic Ocean: Spain's coastline is a joy to visit.

> And then there is Seville in the South – quite apart from its beauty, anyone who has happened across a spontaneous Flamenco session during a walk on a random Sunday afternoon will not forget this place, and may well come back over and over again. We went to the heart of the country, its capital Madrid, and met Ángel González Lucas, General Manager of Sika Spain, to hear how he feels about his home.

What are your personal secrets for managing a team?
There are no secrets. Sika Spain is a business with a clear customer focus which stands out from the competition by pursuing continuous innovation in both products and services. In addition, when you surround yourself with the best professionals around, people who are focused and motivated, everything comes easier. The thing that makes the difference between good companies and the best companies is the team you gather around you.

The trick? Knowing that you are working at the best company, with the best products, the best team and the best customers...

What is the first thing that comes to mind when you think of working in Spain?
Commitment, creativity, enthusiasm, professionalism... Right now, Spain is a very attractive country, highly developed and modernized, with huge opportunities in a very wide range of sectors, and with a pool of ultra-qualified young professionals for whom mobility is no longer an obstacle.

The impact of the crisis in the construction sector which began in 2008 has forced Spain's construction and engineering companies to expand their know-how and business models for different emerging and developed markets around the world, with major projects such as the AVE high-speed rail line to Mecca, the Panama Canal, the Quito Metro, or the London Olympic Ring...

The financial crisis disrupted the entire Spanish economy and the construction market deeply in 2008. As a businessman, how did you handle this very difficult situation to get above this crisis?
For a variety of reasons, Spain had maintained a very high level of activity in the construction sector, with cement volumes in 2004 and 2005 reaching 56 million tons, and 800,000 new homes a year. The impact of the crisis in Spain was threefold – a global financial collapse, a debt problem, and a slump in construction – and it brought ruin to 80% of the construction market, with a dramatic effect on the country's economy.

In that moment, we gambled on a highly diversified and flexible model which would allow us to make expedited decisions in the initial phase of the crisis. What's more, throughout this period Sika Spain has remained true to its strategic base of offering innovative products and services to its customers, for which, during these 8 years of crisis, the company has maintained its levels of investment in marketing, organization, sales, R&D and its technical department. This has meant that we have been able to go ahead with promotional and training initiatives similar to those run in the more active years, thus clearly differentiating ourselves from our competitors.

I would like to stress that Sika Spain has been able to manage the crisis at local level with a successful model thanks to >

SPAIN IS ONE OF THE MOST ATTRACTIVE COUNTRIES IN THE WORLD

> the substantial leeway and trust we have been granted by the Sika Group.

Spain now ranks third among the economies of the euro area and is the fourth largest economy in the European Union. The country has a strong and diverse manufacturing industry and is one of the biggest tourist destinations in the world. However, after the bursting of a real estate bubble, the country sank into recession and only started to recover in mid-2013. The economic crisis has led to very high losses in production and employment, with almost a quarter of the active population having been unemployed for the last 5 years. We are now in the eleventh consecutive quarter of economic growth since the great crisis of 2008, driven by households and public spending. What are the prospects for economic growth looking forward?

At this point, we are experiencing a recovery which has already lasted a number of quarters, but which has been hampered by the political situation created at the time of the December 2015 and June 2016 elections, and the failure to form a government that year.

Looking at things by sector, some sectors are doing very well, like tourism and the automotive industry, and export levels look to be rising. Furthermore, we are beginning to see a degree of activity in the area of housing, especially in mid/high-level segments, although the existing stock from 2005 has not yet been well absorbed. However, and due to the high level of debt and the political situation, investments in infrastructures and public works remain very low.

In short, the country is fundamentally reliant on private initiative for healthy development, as regards both industry and the housing market.

Project: Dam in Presa de La Breña II
City/Place: Almodóvar del Río (Córdoba)
Sika solution: Concrete admixtures

Ángel González Lucas,
General Manager of Sika Spain

And the construction market? Where exactly does the country need Sika?
Clearly, the Spanish construction model is and will continue to be different to that which existed before the crisis, with maximum cement consumption levels being estimated at around 20 million tons and around 250,000 new homes being built per year, meaning that the sector will have to base itself more on quality than quantity.

New trends and concepts such as sustainability and energy efficiency will be key in the future. Sika needs to deliver continuous innovation in new products and systems, working side by side with universities, technology hubs and research centres.

What are the immediate goals for Sika Spain?
Without a doubt, our goal is to maintain our market leadership position, further enhancing our brand if possible, and embracing our role within society – fulfilling the corporate sustainability and responsibility criteria – and all this without for one moment losing our customer focus.

The author Anthony Ham wrote this about Spain: "The life that courses relentlessly through the streets here always produces in me a feeling that this is a place where anything can happen. Here, the passions of Spain's people are the fabric of daily life; this is a country with music in its soul, a love of fine food and wild landscapes, and a special talent for celebrating all the good things in life..." I think that comes pretty close to what Spain is all about, don't you?

>

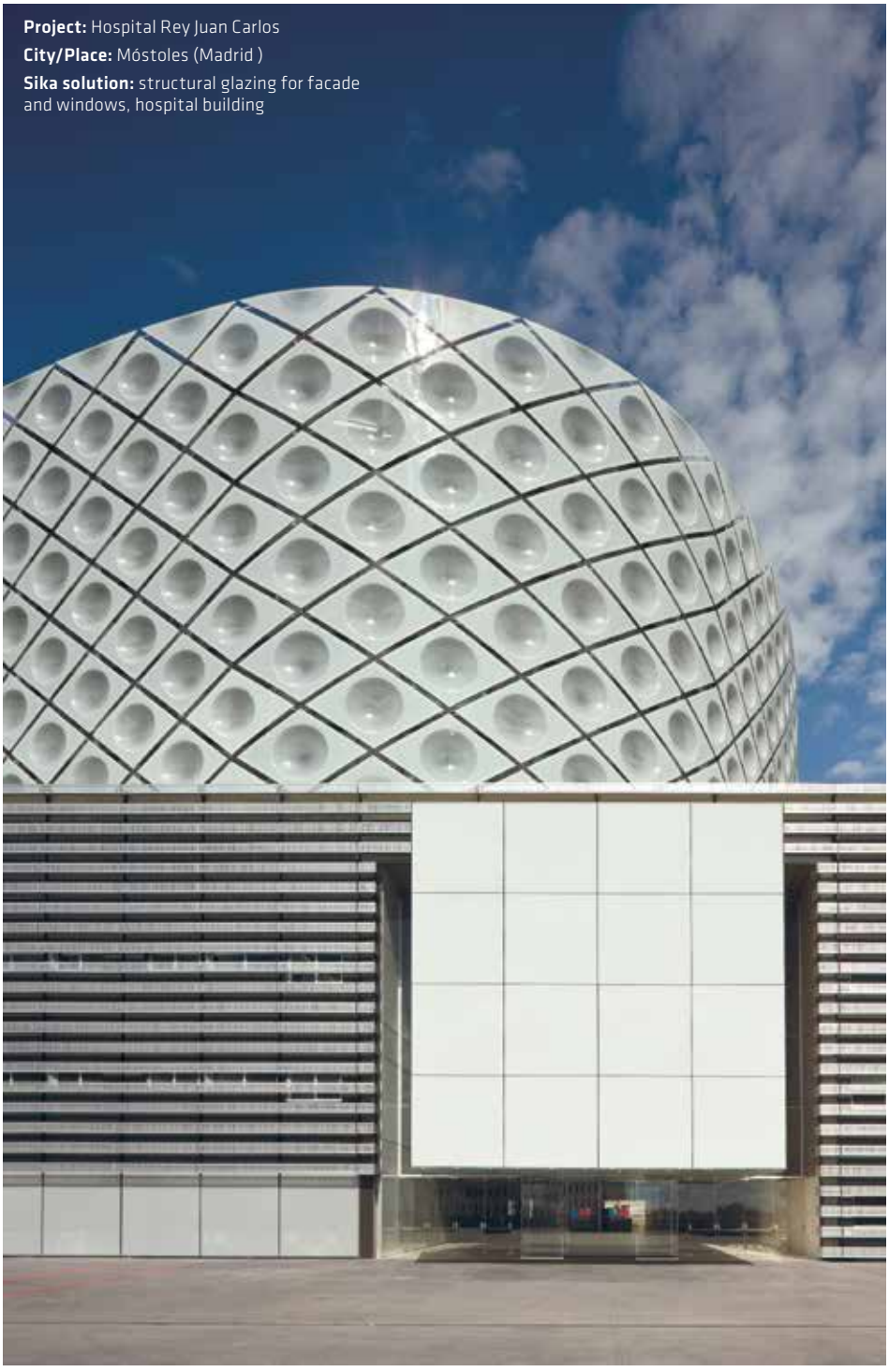
Team Sika Spain.

> Spain is one of the most attractive countries in the world, thanks to its culture, climate, cuisine ... the lifestyle, very open and with a lot happening in the street, means that the people here can very successfully combine a highly professional dedication to their work with an enjoyment of life in terms of all the opportunities and potential the country has to offer.

What is it that you personally enjoy the most about life in Spain?
Our lifestyle, our culture, the way we relate to others, the passion with which we approach everything we do ... It can't be described, only experienced.

What are your aspirations for your country looking forward?
My "Christmas list?"... That's easy, I would ask for political and economic stability, to allow us to focus on projects which will add value and bring wealth to our society ... And I would like to see construction, the sector which has always been the driving force of Spain's economy, get back on top where it belongs. <

Project: Hotel W (Hotel Vela)
City/Place: Barcelona
Sika solution: glass facade bonding and sealing, structural glazing, weatherproofing



Project: Hospital Rey Juan Carlos
City/Place: Móstoles (Madrid)
Sika solution: structural glazing for facade and windows, hospital building

Project: Viaducto calle Bailén
City/Place: Madrid
Sika solution: Complete refurbishment: repair with mortar, concrete waterproofing

Mark Schneider, Head Global Product Sustainability, harvests vegetables and fruits at the hydroponic garden on the premises of Sika Peru. A second hydroponic garden has been created for the Juan Pablo Magno Children's Home in Lurín, the community where Sika Peru is located. The project is part of Sika's "More Value – Less Impact" campaign.

GARDENING WITHOUT SOIL

NASA is currently experimenting with growing food hydroponically in space. During a mission to Mars or a stay on the moon, where astronauts would be away from earth for a long time, they could greatly profit from hydroponic food. Growing food in the cosmos may be the future, with astronauts, urban gardeners, and home farmers all using hydroponic systems to grow food in small indoor spaces using a relatively controlled system.

TEXT: ROCIO GALVEZ, ASTRID SCHNEIDER
PHOTO: SIKA PERU, MARK SCHNEIDER

> Hydroponic gardening is already popular today. Savings in labor overheads (no weeds, no soil), a higher consistency of crops with great tasting results, year-round cultivation and perfect adaptability to urban settings are just a few of the advantages that have made this technique famous.

A subset of hydroculture, hydroponics is a method of growing plants using mineral nutrient solutions in water, without soil. Terrestrial plants may be grown with their roots in the mineral solution only, or in an inert medium, such as perlite or

Planting, nurturing and harvesting plants and vegetables strengthens team qualities such as commitment, constancy, innovation, creativity and collaboration.

gravel. Possible nutrient sources in hydroponics are nitrogen, sulfur, phosphorus, magnesium and calcium.

Sika Peru has established a hydroponic greenhouse for educational purposes. 30 employees from Production plus another 30 from Administration and Sales are actively involved in the project.

New possibilities for self-harvesting healthy food are identified, and the nutrition of Sika employees and their families can be improved with crops high in iron, such as spinach or watercress. Numerous other vegetables are also being cultivated, including lettuce, basil, chives, tomatoes and aguaymantos (a fruit-bearing plant indigenous to Peru).

Planting, nurturing and harvesting plants and vegetables strengthens team qualities such as commitment, constancy, innovation, creativity and collaboration. The project has helped to develop a better understanding of water as a unique and valuable resource as well as improve waste handling.

Sika volunteers supported efforts to create a hydroponic garden on the grounds of the Juan Pablo Magno Children's Home in Lurín, a district in Lima Province. The staff of Sika Peru continue to devote time to the social and environmental initiative. A classroom session has already been held in the greenhouse. The 36 m^2 area occupied by the greenhouse used to be a garden, now it contains more than 150 different kinds of hydroponic crop.

Various recycled goods were used during the building process, including nutrients such as MDF (medium-density fiberboards) from packaging, raw material containers, and buckets. A solar panel was also installed to support the water pumps for the electric systems. Three main hydroponic techniques were taught: 1) vertical, 2) dripping and 3) floating roots. What distinguishes these systems from one another?

1) Vertical hydroponic systems such as living walls or green walls can be either free standing or attached to a building structure. It is a great way to grow vegetables, fruits and other plants either indoors or outdoors and can also incorporate automated hydroponics. It allows high-density yields and shorter growth cycles.

2) Generally, each plant has one emitter at its base and the water is either on a timer or manually turned on. Tomatoes, eggplant, cucumbers and some smaller crops are watered using drip >

THE PROJECT HAS HELPED TO DEVELOP A BETTER UNDERSTANDING OF WATER

> systems in the greenhouse, which is probably the most common way to grow large, long-term fruiting crops.

3) Plants are planted into trays that float on the water. The roots hang down into the water, which is heavily aerated to avoid drowning. The big advantage of deep water culture is that it uses space very efficiently because there are so few isles. It also uses no overhead watering, which reduces disease pressure, can be quite inexpensive to set up, and grows plants quickly. As plants older than 3 months tend to develop root problems, this is primarily employed for short-term crops.

The first project phase started in November 2015 and is scheduled to end in December 2016. The next step will be to engage with communities near Sika's facilities in order to help them improve their nutritional habits and to share any new findings with them. In July 2016, some five Sika Peru employees were selected to develop a greenhouse either at home or for business purposes. By December 2016, at least one community in Lurín will develop a greenhouse model with Sika's assistance.

The project's objectives now are almost achieved: maintaining an educational hydroponic gardening within Sika, while about 20 families operating gardens and have been able to share the experience within the community of the Casa Hogar Juan Pablo Magno. There collateral impacts are relevant as Sika Peru has set up contacts with stakeholders who make similar projects and improve relationships within families of Sika's employees with gardens at home.

The next step is to engage with communities near Sika's facilities in order to help them improve their nutritional habits

If you've ever been interested in growing your own food, but the lack of a garden plot or yard has kept you from pursuing it, you may want to consider starting an indoor or balcony hydroponics garden. Technology has paved the way for quite a few different plug-and-play hydroponics systems, ranging from aeroponics to aquaponics, all designed to efficiently grow food in a small space. <

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1 Maintaining an educational hydroponic gardening within Sika, while about 20 families operating gardens sharing the experience.

2 Even without a garden there are nice planting concepts.

HOW TO RELIABLY BOND A WIND TURBINE BLADE WITH ALMOST A TON OF ADHESIVE?

Worldwide, targets for renewable energy continue to be the primary means by which governments express their commitment to renewable energy. As at year-end 2015, 173 countries had established renewable energy targets at national or state/provincial level. Targets have also been adopted at regional level, incorporating joint commitments by several countries, according to the REN21[1] in its Global Status report about renewables of 2016.

TEXT: ASTRID SCHNEIDER
PHOTO: FOTOLIA, SIKA SERVICES AG

By 2030 wind energy could reduceemissions by more than 3 billion tons of CO_2 per year.

> Dr. Fatih Birol, Executive Director of the International Energy Agency, highlights the rise in the importance of wind energy: "In 2015, the increase in wind-powered generation was equal to almost half of global electricity growth ... for the second successive year, global CO_2 emissions remained stable despite growth in the world economy. This was due to industrial restructuring, improved energy efficiency and the substantial growth of renewables – led by wind."[2]

What's happening around the globe? China crossed the 100,000 MW mark in 2014, adding another chapter to its already exceptional history of renewable energy development since 2005. This year it made history again, strengthening its position on the leaderboard. 2015 was a strong year for Europe and North America, with Germany and the US leading the way on their respective continents. Guatemala, Jordan and Serbia each added their first large commercial wind farms, and South Africa became the first African market to pass the 1 GW mark.

Studies by the Global Wind Energy Council (GWEC) have identified three main drivers[3] of the mid-term growth of wind energy. The first is the positive outcome of the climate negotiations at the UNFCCC's COP 21 in December, which was an unexpected pleasant surprise. The long-term targets adopted by the 186 countries gathered in Paris are a de facto call for a 100% emissions-free power sector by 2050 at the latest.

Second it is obvious that the costs of wind energy have fallen dramatically in recent years, and new and complex financing structures are creating conditions that will make renewables competitive in an increasing number of markets. Third we have to look to the United States. As a pioneer in the global wind power industry with some of the best wind resources in the world, it has had much lower prices than most of its OECD competitors for some time. However, the difficulty has always been the on-off nature of the US market. The US Congress passed a law for a long term extension and phase-out of the Production Tax Credit (PTC) that has been the main federal policy support for wind energy in the US.

The studies also show that under certain conditions, wind-powered generation could reach 2,000 GW by 2030, supplying up to 17 – 19% of global electricity, creating over 2 million new jobs and reducing CO_2 emissions by more than 3 billion tons per year. By 2050, wind power could account for 25 – 30% of global electricity supply. Countries with the biggest wind power capacity are China, the United States, India, Germany, Spain, Italy, the UK and Brazil. We are hugely excited about this development. But what exactly is behind a wind turbine for electricity generation?

The rotor blades are a key component in the overall turbine, and particular attention must be paid to their fabrication at every stage from design through to production. In two-piece blade construction (see graphic p. 25), two composite shells

BY 2050, WIND POWER COULD ACCOUNT FOR 25 – 30% OF GLOBAL ELECTRICITY SUPPLY

are bonded together along their leading and trailing edge and in the area around the shear webs. Since the blades are exposed to all kinds of weather and enormous stresses for decades, the adhesives used to bond them have to be just as durable. It has been shown that the toughened system is more resistant to damage initiation than the standard material with increasing numbers of cycles. For instance, after one million cycles in severe conditions, the standard adhesive material shows at least twice as many cracks as the toughened system.

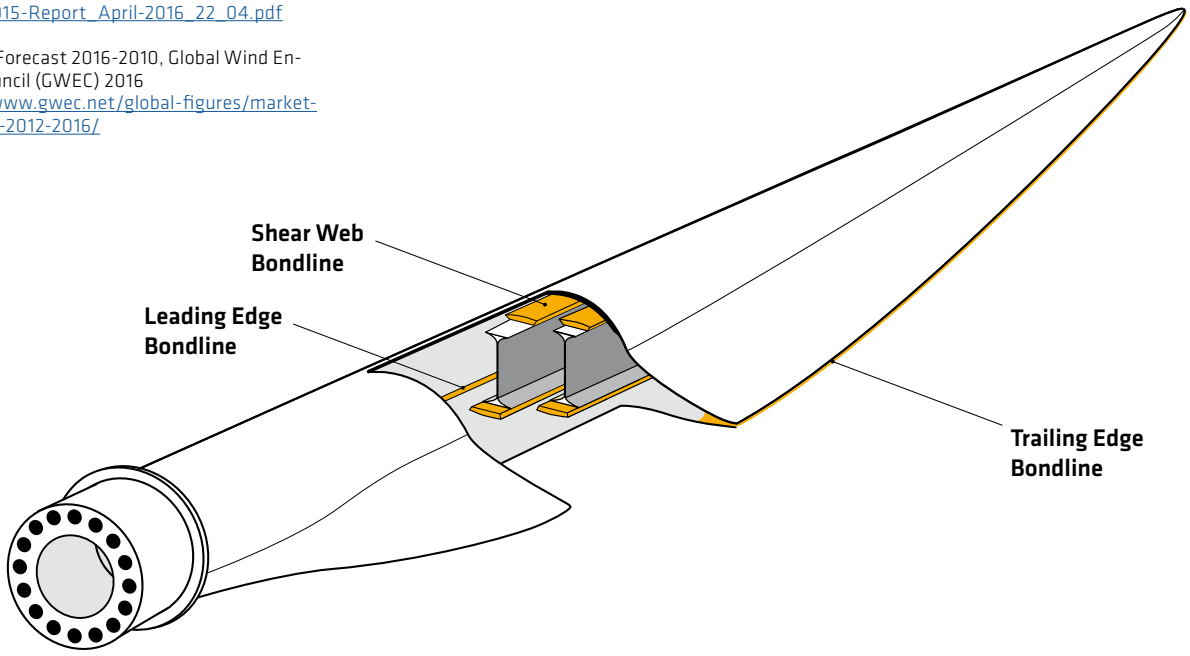
Sikadur® WTG-1280 LD is a tough, high-strength, solvent-free, thixotropic epoxy adhesive. It is used for structurally bonding highly stressed components in the assembly of wind turbine blades. The product offers long open times at elevated temperatures, easy pumping and application and fast processing times. Sikadur® WTG-1280 LD therefore has class-leading toughness and fatigue properties for enhanced durability, ensuring longevity and reliability in today's multi-MW wind turbines – even under the toughest conditions. Since the adhesive is load bearing in this type of construction, high mechanical and fatigue properties are required. Consequently toughened epoxy adhesive systems are used nowadays. Between 500 and 800 kg of adhesive is used per blade.

Sika accompanies you in every step of the process: fabrication of molds and models, manufacturing and assembly of blade shells, finish and repair as well as surface protection and the attachment of interior and exterior elements. Sika's standard adhesive range includes

[1] Renewable Energy Policy Network of the 21st century. The network stands at 700 renewable energy, energy access and energy efficiency experts; see current report: http://www.ren21.net

[2] Global Wind 2015 Report, p. 6; http://www.climateactionprogramme.org/images/uploads/documents/GWEC-Global-Wind-2015-Report_April-2016_22_04.pdf

[3] Market Forecast 2016-2010, Global Wind Energy Council (GWEC) 2016 http://www.gwec.net/global-figures/market-forecast-2012-2016/



Hub transport to the erection site of the turbine.

> products for bonding lightning protection systems, balancing blocks, vortex generators, winglets and much more.

What will the future bring? Scientists are racing to develop high-altitude wind turbines capable of harnessing stronger and more consistent winds higher in the atmosphere. Although different models are either in the design or testing stage, there are significant feasibility, and particularly, viability issues associated with their development. Though in 9,000 m above sea level winds are up to 20 times stronger, but still before there is much to do to use wind efficiently on earth on all continents. <

1 Bonded wind turbine blades ready for transport.

2 The wind blade is lifted in order to get fixed to the turbine.

3 High in the air blades and rotor get attached to the nacelle.

4 The tower of a wind turbine is about 120 – 140 m high.

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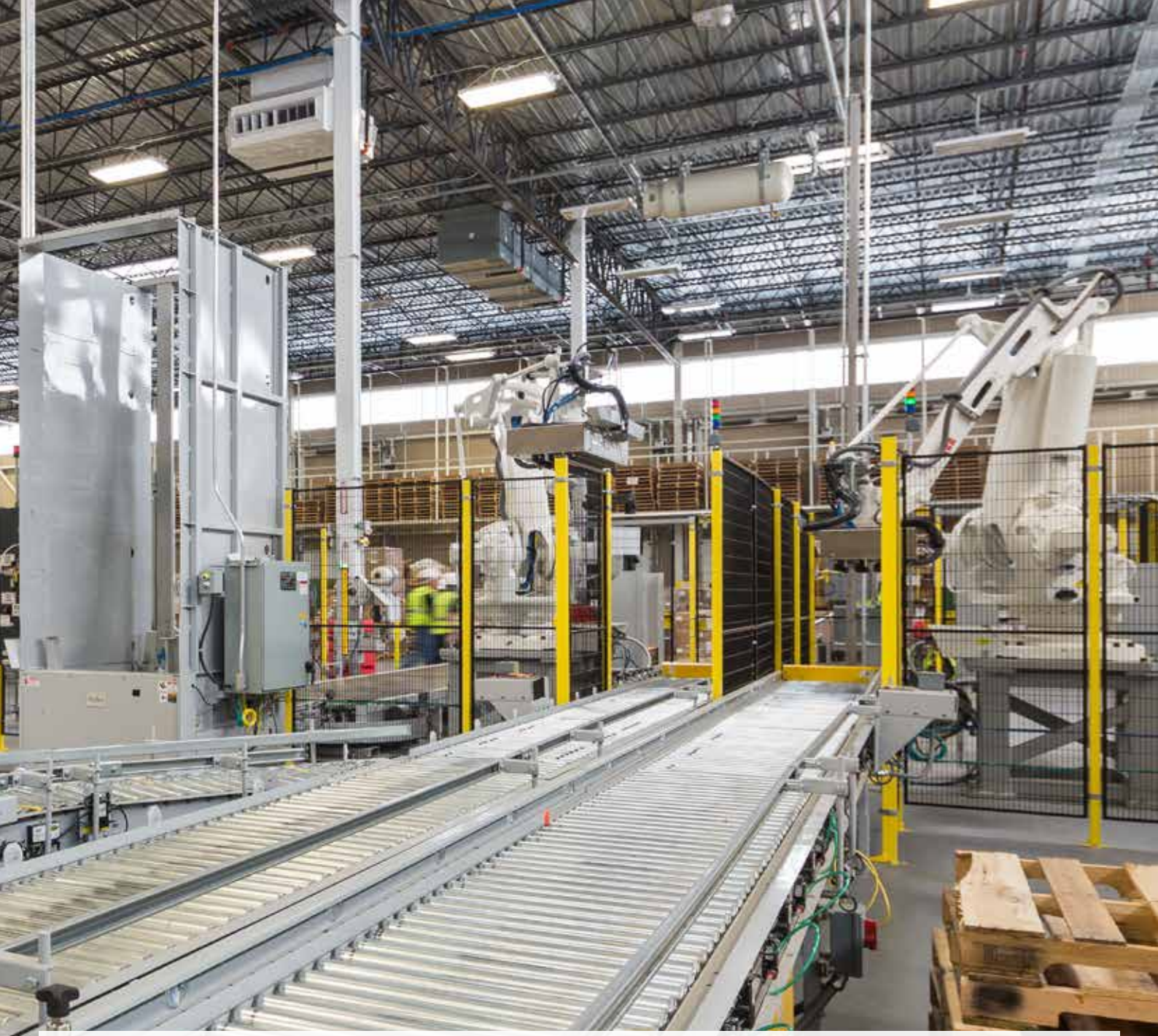
Bastian



HOW HEALTHY FOOD FINDS ITS WAY TO OUR TABLES?

How often do you give any real thought to the supply chain behind the food you eat? Nowadays, it's not only tropical foodstuffs such as sugar, coffee, chocolate, tea, and bananas that are shipped long distances to reach our tables, but also fruits and vegetables that used to be grown locally in household gardens and on small farms.

TEXT: JANE RUEEGG, ASTRID SCHNEIDER
PHOTO: SIKA SERVICES AG

Each food or beverage industry has own requirements for flooring, walls and other surfaces.

> An apple imported to California from New Zealand or to Germany from South Africa is often less expensive than an apple from San Francisco or Munich just an hour away. Our focus here is not on the question of whether this is really cheaper in the long-term or more sustainable. Instead, we want to take a look at food production plants, a very important part of the supply chain and where the most rigorous of hygienic standards have to be met to produce healthy food. Numerous factors need to be addressed during the building design process.

The vast food processing industry is made up of many different types of business, such as dairy and beverage plants, catering and industrial kitchens, wineries, fish packing facilities, bakeries, fruit and vegetable processing plants and snack production operations. Each of these has its own specific requirements for flooring, walls and other surfaces. The range of installations includes freezers, bottling lines, raw material processing and handling zones, as well as packaging and storage areas. The list is endless. The key to designing an efficient industrial facility is to study production line and operation requirements and communicate frequently with facility managers.

Depending on what it manufactures or stores, an industrial facility normally handles a lot of activities on a daily basis, including moving heavy loads, pallets and boxes around, sometimes under strict temperature requirements. Another common issue is the need to renew the floors to accommodate a totally different kind of business after a number of years.

What is more, the floors not only have to withstand severe exposure to mechanical, chemical and thermal stresses for example, they also need to provide the right degree of slip resistance required under health and safety regulations. Sika's full range of seamless and resistant flooring >

Opposite page: Obviously the most rigorous of hygienic standards have to be met in food and beverages production.

UNSAFE FOOD POSES MAJOR ECONOMIC RISKS, ESPECIALLY IN A GLOBALIZED WORLD

> solutions offers various world-beating technologies and proven quality to meet all these challenges.

Food safety and hygiene have become visible on the radar screens of consumers, industry, regulators, and other stakeholders like never before. The Global Food Safety Initiative (GFSI), along with its various certification partners, has raised the bar on food safety across all segments of the industry from raw material suppliers and producers to distributors and retailers. And for good reason. More than 200 diseases are known to be caused or carried by food.

The World Health Organization (WHO) reports that every year thousands upon thousands of people die from them. A 2010 global study, for instance, showed an estimated 582 million reported cases of food illnesses spanning 22 different diseases and causing approximately 351,000 deaths. But there's even more at stake. Unsafe food poses major economic risks, especially in a globalized world. Take for example Germany's 2011 E. coli outbreak, which reportedly caused USD 1.3 billion in losses for farmers and industries across Europe and elsewhere.

Innovations that have been developed to satisfy consumers' demand for more nutritious and better tasting food are not enough. These innovations must also be implemented at the plant level. The facility itself has to be designed and constructed in ways that prevent any possibility of food contamination.

Choosing the right flooring, walls, and other surfaces can help do this. Ideally, flooring should be seamless and easy to clean, sanitize, and rinse thoroughly to remove wash-down residues and any viruses, bacteria or pests that might be present.

Besides hygiene safety, other major concerns facing every buyer are maintenance, durability, resistance, cost assessment, sustainability, warranties and quality assurance, plus the required certifications. Sika not only provides the products, but also a consultative, time-sensitive, and service-based approach to their activities, which is important for the complex challenges to be resolved.

A further hygienic safety consideration, and one where increasing emphasis is now being put, is aesthetics, most particularly colors, for both functional and safety reasons. From a technical point of view, colors other than the traditional

Choosing the right flooring can prevent any possibility of food contamination.

red, such as yellow and beige, are often now preferred because food waste, dirt and other contaminants can be more easily seen. Color can also have a big influence on the perceived quality of the workspace too, with lighter and brighter colors creating a much more positive environment than darker, flatter colors. Meat plants, for instance, often now use yellow instead of red so that food waste can be very quickly seen and cleaned up; salad and vegetable facilities now prefer to use green or yellow.

Current food trends could be summed up by the buzz terms “snackification”, low-fat, weight wellness, naturally functional proteins, good and bad carbs, free-from-whatever-comes-to-our-minds or digestive health. But we must always remember that we are at the very end of the food chain. Whichever new trend we come up with and follow, there are many challenges to bridge before servings of healthy food land on our table and we have to decide what to eat and how much. <

A ROOF INSTEAD OF AN AIR CONDITIONER

Mark Twain once wrote, “Mauritius was made first and then heaven, heaven being copied after Mauritius”. Anyone who has discovered its sapphire blue waters and powdery white beaches would surely agree. The islands of Mauritius and Rodrigues (172 km southwest) form part of the Mascarene Islands, along with nearby Reunion Islands, a French overseas department. The country covers an area of 2,040 km^2, and the capital and largest city is Port Louis. Mauritius was a British colonial possession from 1810 to 1968, the year of its independence.

TEXT: ASTRID SCHNEIDER
PHOTO: CONSTANCE HOTELS AND RESORTS

One thing that will stay forever in your memory is the luxury resorts and hotels all around the island.

> Mauritius had been an important base on the trade routes from Europe to the East before the opening of the Suez Canal and was involved in the long power struggle between the French and the British. The people of Mauritius are multiethnic, multi-religious, multicultural and multilingual. The island's government is closely modelled on the Westminster parliamentary system, and Mauritius is highly ranked for democracy and for economic and political freedom.

What is there for tourists to do on this pearl in the Indian Ocean? Lie on a beach all day? Or enjoy the wonderful range of activities on offer? Either way, you can't really lose, and there's not much you can't do here on the water. Highlights include kitesurfing, boat excursions to the beautiful islands of the lagoon, and the full suite of paddling activities. The diving and snorkeling here are terrific, encircled as Mauritius is by shallow waters, a coral reef, sublime underwater topography and a dramatic ocean drop-off. On land, you'll need to decide between fabulous hikes and horse riding.

But one thing that will stay forever in your memory is the luxury resorts and hotels all around the island. These are places of the utmost refinement, offering impeccable service and facilities range from pampering spas, designer rooms and extensive watersports options to dreamy swimming pools, expansive palm-strewn grounds and world-class restaurants.

One of these outstanding resorts is the stylishly renovated Constance Belle Mare Plage. Part of the Mauritian hotel chain, it is one of the country's most successful hotels, with an average occupancy rate of 90%. It offers comfortable accommodation in a lively and cozy atmosphere. You can choose from one of the 104 prestige rooms, 149 junior suites, 6 deluxe suites and 18 distinctive villas or the presidential villa for a top-notch holiday. Seven exclusive restaurants and 6 hip bars await guests. The resort is located along a 2 km white beach in a sheltered bay on the East Coast of Mauritius.

May 2016 saw the start of refurbishment work on the hotel. Time was quite limited as the reopening was scheduled for mid-July. The refurbishment project included roof waterproofing over a surface of 7,000 m^2 while flat concrete roofs were being installed at the hotel. The existing roof waterproofing was held together by bituminous sheets put in more than 15 years ago. Since some of the sloped areas were thatched, it was highly risky to torch weld the membranes, especially because Belle Mare faces the trade winds >

The refurbishment project included roof waterproofing over a surface of 7,000 m.

> of Mauritius. The specifications were to remove the existing membranes and install new double layers of bituminous membranes.

Sika Mauritius proposed using the cold applied liquid polyurethane membrane Sikalastic as this doesn't require removing the existing bituminous sheets. The overall application time is then much shorter and the problem of disposing of the old membranes is solved.

>

The diving and snorkeling here are terrific, encircled as Mauritius is by shallow waters, a coral reef, sublime underwater topography and a dramatic ocean drop-off.

With the Sikalastic® 570 Topcoat the roof remains bright white even under the severe UV exposure experienced almost throughout the year in Mauritius.

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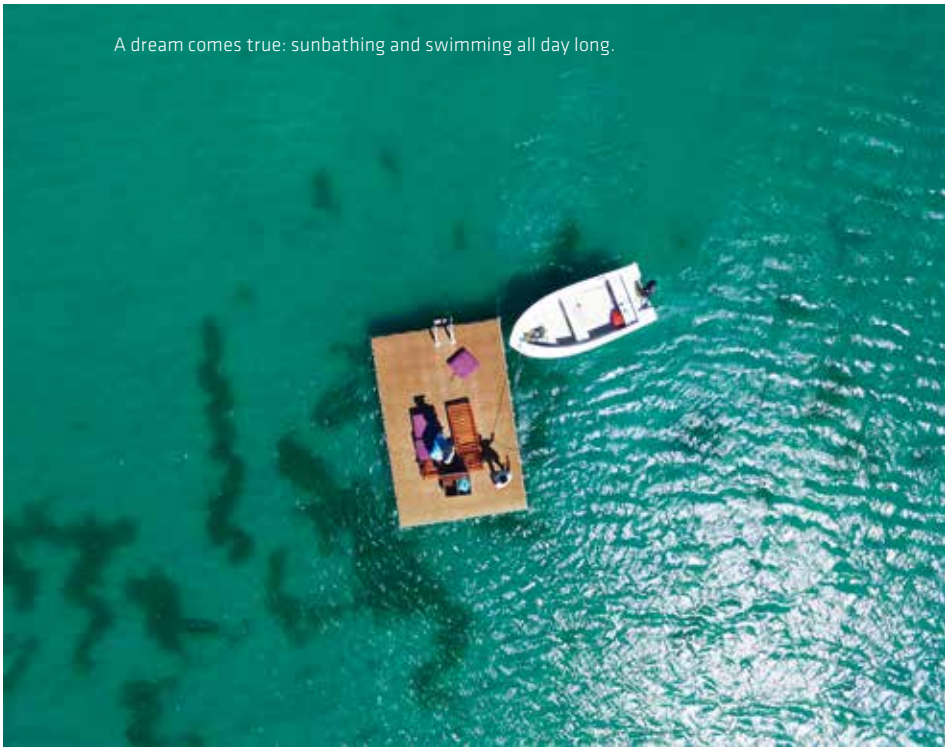
SO COME AND ENJOY THIS ISLAND AND BE ENCHANTED BY ITS UNIQUE BEAUTY

> Given that the job had to be done in less than 3 months, time-saving solutions were most welcome. The client was also very interested in the energy-saving potential of the solar reflectivity values achieved with Sikalastic. In fact, the most common complaints that the hotel received from clients were about the high temperatures they encountered on returning to their rooms and the fact that it took hours to cool them down to an acceptable level.

Constance Hotels and Resorts' chief engineer installed machine monitoring software, chillers, energy consumption surveillance equipment and an in-house weather forecast station to provide very precise statistics on energy consumption and a better projection of needs.

Sikalastic® 570 Topcoat is a very economical solution that meets high solar reflectance index (SRI) requirements. The results on site were very convincing, with the Sikalastic® 570 Topcoat remaining bright white even under the severe UV exposure experienced almost throughout the year in Mauritius. The temperature measurements made by the hotel engineer confirmed that the product reduced the hotel's inside temperature by 4 to 5°C.

The highly diverse coastline of Mauritius is a veritable wonderland, boasting sandy bays and the mountainous backdrops of the Black River (Rivière Noire) and Tamarin, as well as the dramatic beauty of Le Morne Brabant, an awesomely photogenic crag capping the southern coast tip. Not far inland, Mauritius rises steeply. This part of the island encompasses the fauna-filled Black River Gorges National Park and beguiling Chamarel, one of the loveliest towns anywhere on the island. So come and enjoy this island and be enchanted by its unique beauty. There is bound to be a room free at the Constance Belle Mare Plage Hotel. And even without turning on the air conditioning, you will find the room temperature agreeable. <



A dream comes true: sunbathing and swimming all day long.

The Swiss artist Monica Jäger used 750 kg of SikaGrout-314 to produce this sculpture.

Monica Ursina Jäger.

BLACK-LEAVED PLANTS EMBEDDED IN 750 KG OF SikaGrout

TEXT: ASTRID SCHNEIDER
PHOTO: RICARDO GOMEZ

The photographer and I meet Swiss artist Monica Ursina Jäger in her studio near Zurich, Switzerland. We are both used to going to museums and galleries to see final art works and exhibitions. So it's quite a special experience for us to witness the entire evolution process behind a piece of art.

> Immersing ourselves into a totally new world, we enjoy seeing the actual handwork of creating sculptures. Sika provided the artist with 750 kg of SikaGrout-314, which she needed to produce the works for her next exhibition, about to open in Zurich. We are more than curious. The big question is how almost a tonne of flowable, cement-based mortar can be used for sculptures?

What is your background in art?
I've been a practicing artist for ten years. I studied at art schools in Lucerne and Singapore and received my Master in Fine Arts from Goldsmiths College, University of London. My work embraces drawings, sculptures and installations with a variety of artistic media such as Chinese ink, pigment transfers, concrete and wood. >

In this project there are materials with different temporalities: SikaGrout combined with living black-leaved plants and chlorophyllin.

> **Can you share with us the intention behind your art?**
This particular installation is called "This is the day to shape the days upon" and is a reference to the "Cité des Etoiles" social housing estate designed by French architect Jean Renaudie (1925 – 1981) in Givor, France. The goal of Renaudie's architecture was social exchange among the socially weak, which he valued much more than the pure functionalism favored by so many of his contemporaries. The concrete sculptures also evoke images of the "Bosco Verticale" towers in Milan, which are considered to be pioneering in terms of ecological sustainability. The plants in my concrete objects all have natural black leaves. The green chlorophyllin normally associated with nature will be painted on plasterboards leaning against the wall behind the concrete object. While the plants will grow, the light-sensitive pigment will slowly fade during the exhibition.

The installation invites the viewer to reflect on historical and contemporary architectural languages and material, the relationship between the natural and the constructed environment, and our aspirations and longings for the future.

What influences your art the most?
Art is a tool and method to experience the world and to reflect on my surroundings. I'm mainly influenced by the natural, fabricated and constructed environment around me: landscape, architecture and nature as real social sites and historical and narrative spaces. I'm fascinated by the relationship between the physical environment and its mediated experience and the possibilities that occur with the dissolution of reality and fiction. A particular interest of mine is reading essays on urbanism, landscape development, environmental issues and the history of architecture.

Why did you decide to work with SikaGrout?
My recent projects reflect on social housing utopias from the 1960s. I wanted to pay tribute to the material used in the original building. My intention was to create an architectural model, a planter and a traditional sculpture all in one. Since my sculpture has a very thin-walled, complex shape, I was looking for a material that would suit these requirements. In collaboration with the Sika technical team and me decided on SikaGrout, which turned out to be the perfect match. This is now my third sculpture with SikaGrout, the previous ones having been a great success. One of them is now located in a private art collector's garden, the other is now part of the public art collection of the Canton of Zurich in Switzerland.

>

"Since my sculpture has a very thin-walled, complex shape, I was looking for a material that would suit these requirements."

The artwork shortly before the opening in Helmhaus, Zurich.

> **Which materials did you combine with SikaGrout in your recent project?**
In this project, I combine materials with different temporalities: SikaGrout, living black-leaved plants and chlorophyllin. I hope that the solid grey, living black and delicate green of the different components interact in a playful and complementary way.

If you hadn't become an artist, what would you have become instead?
The beautiful thing about being an artist is that I can choose to be whatever I want. I can be a historian, a geologist, an architect, a model maker, an anthropologist or a storyteller. Or all of these at the same time. For me there is no other way of being in the world.

What projects do you have coming up?
The current work can be seen at Helmhaus Zurich until November 20, 2016. After this I'll be involved in a sculpture biennale in Switzerland where my partner Michael Zogg and I will create a large-scale outdoor sculpture. In London I'll be showing drawings from the "future. archaeologies" series, and in Stuttgart I'm working on an exhibition that deals with new ideas of nature, the collective and the social in the Age of the Anthropocene.

Are there still any dreams that you wish to fulfill?
I would love to own a larger artist studio where ideas can manifest on a bigger scale. I'd love to visit Brazil and study the works of modernist architects such as Oscar Niemeyer, and I dream of a journey to Japan to discover its landscapes, cities and culture. <

Monica Ursina Jäger is a Swiss artist living in London and Zurich. Her multidisciplinary approach engages with spatial experiences both within the natural and the constructed environment.

Recent works address the uncertainties of geopolitics in terms of natural resources and man-made production. Interdisciplinary projects include urban planning, green infrastructures and narrative environments in public parks.

Jäger studied in Singapore and London and gained her MA at Goldsmiths College London. She has exhibited widely nationally and internationally, e.g. Kunsthalle Düsseldorf, Kunstmuseum Thun, Helmhaus Zurich, Galeria Pilar São Paulo, Sammlung Essl Klosterneuburg/Vienna, Haus Konstruktiv Zurich, Kunsthalle Osnabrück, Kunstverein Pforzheim. Winner of the Swiss Art Award 2007.

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I CAN BE A HISTORIAN, A GEOLOGIST, AN ARCHITECT, A MODEL MAKER, AN ANTHROPOLOGIST OR A STORYTELLER.

BUILDING TRUST