



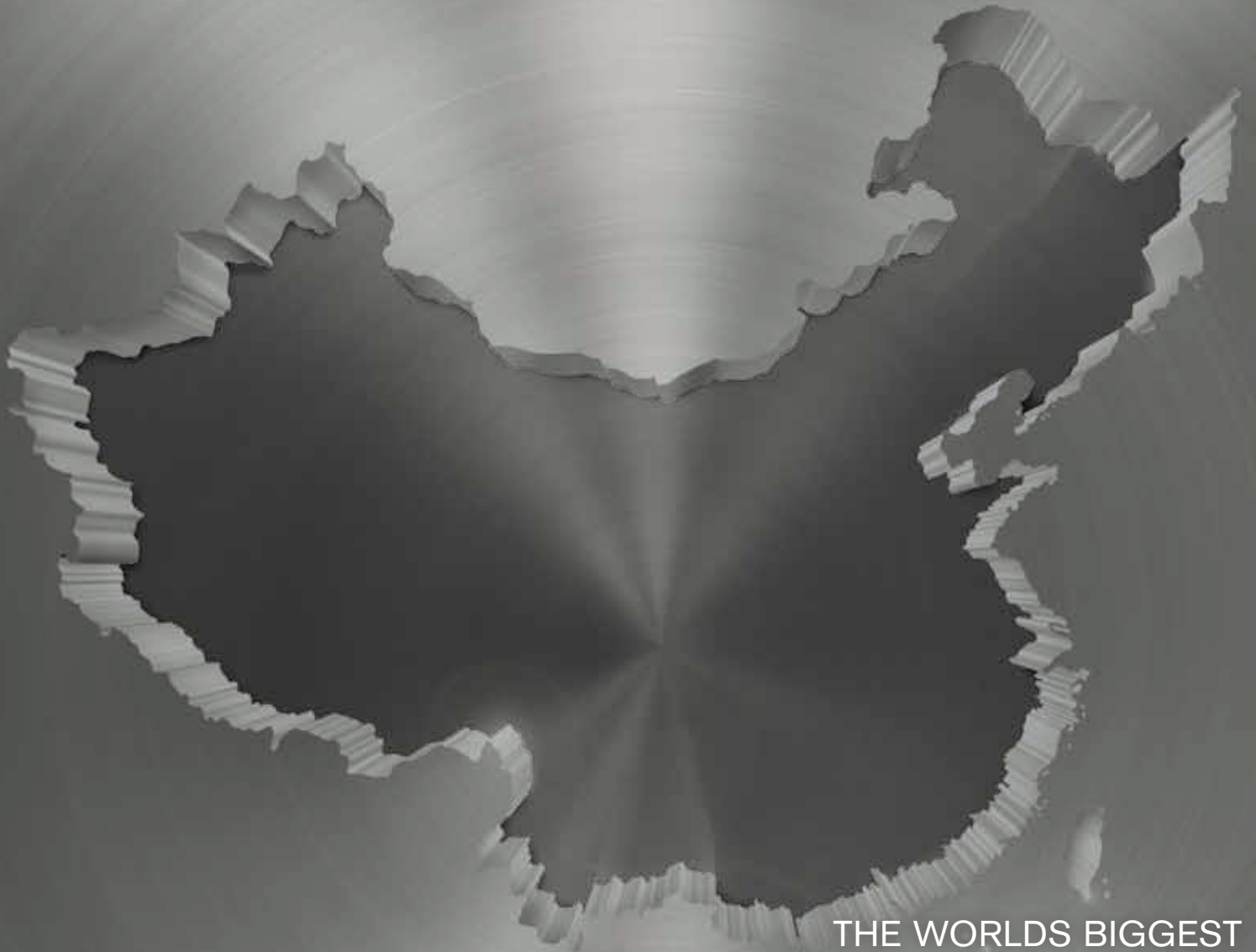
A magazine from the Sapa Group • # 1 2012

# Shape

 EASY BICYCLE PARKING  
IN THE NETHERLANDS

 SHINING RELIABILITY  
ON SOLAR PLANTS

 BRIGHT LIGHT FOR  
A GREEN SECTOR



THE WORLDS BIGGEST  
ALUMINIUM MARKET:

# CHINA

## SAPA IS ON-SITE

PAGE



**sapa:**

# Shaping the future in Asia

**O**n February 15th 2012 we inaugurated Sapa's first extrusion plant in China, Sapa Profiles Jiangyin. Sapa has our Heat Transfer plant in Shanghai, had operations in China since 1996, but within Profiles the activities have been limited to our Profiles fabrication unit, serving some of our global customers with presence in the region.

The last couple of years we have been working hard to expand our business in Asia. With the acquisition of Alufit in India, the establishment of Sapa BTG in Vietnam, the joint venture with Chalco, and now lately the opening of Sapa Profiles Jiangyin, we are reinforcing our ability to serve customers in the region. By utilizing the experience and technical expertise in Sapa, new solutions will be brought to these markets, benefiting both our local and global customers. In Jiangyin we are now implementing a wide range of improvement activities to enhance the capacity utilization and the capabilities of the plant, including the move of a big 6,800 tonnes press from North America.

Once this move is made and the capacity of the plant is ramped up, Sapa Profiles Jiangyin will be one of the two largest plants in the Sapa Group. Simultaneously, we are putting considerable efforts in building a strong organization capable of serving customers in the whole region.

Back in 1996 Sapa was one of the pioneers in China. One person, who helped build the platform to the success we're having in China today was Torbjörn Sternsjö. Today he is the CEO of SCAP, Sapa's joint venture with China's largest aluminium producer Chalco. Together the two companies will build a state of the art factory outside Chongqing, to make structural body-parts for the rapidly growing rolling stock industry in China. In this issue of Shape Magazine, you can read more about Torbjörn, and how Sapa became a recognized partner to one of the largest corporations in China.

The journey of Shaping the Future in Asia has only begun.



*Svein Tore Holsether*  
**Svein Tore Holsether,**  
 President & CEO Sapa

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With a population of 1.3 billion, China is the biggest aluminium market in the world. Sapa established its first company in Shanghai back in 1996 and in 2011 the next step was taken.



Meet Torbjörn Sternsjö, CEO of Sapa Chalco. In 2010, he received Shanghai's Honorable Citizenship Award.



The challenge was to create a bicycle parking system that is user friendly and stands out. The solution is a double deck system in aluminium, now in use in the Netherlands.



Building cranes are going full speed in Angola's capital city, Luanda. One of the most recent projects is the Sky Business building, where Sapa has supplied an aluminium curtain wall.

Solardome Industries has been working with Sapa Profiles for 20 years. Their domes are a striking alternative to a greenhouse.



Sapa is an international industrial group that develops, manufactures and markets value-added aluminium profiles, profile-based components and systems, and heat exchanger strips in aluminium. Sapa has annual sales of approximately SEK 33 billion and around 14,800 employees in companies throughout Europe, and in North America, Central America and China. Shape is the Sapa Group's customer magazine, and is issued twice annually in 16 languages. Shape is also available at [www.sapagroup.com](http://www.sapagroup.com)

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**sapa:**  
 Shaping the future

# COOL SOLUTION FOR HEAT SINKS

**Sapa Profiles Shanghai** has developed a new heat sink solution with heat pipes that will increase thermal efficiency even further.

**A**s one of the leading companies in the design and manufacture of aluminium extruded heat sinks, Sapa has the expertise and product solutions to increase thermal efficiency for applications in the computer, electrical, automotive, telecommunications, medical, LED and power electronics industries.

The heat pipe heat sink solution combines aluminium extrusion with copper heat pipe technology. Heat pipes are bonded to the heat sink through soldering, epoxy adhesive or press-fit. The fluid flow – typically water – in a heat pipe is driven by gravity and therefore no external pump is required. As a two-phase (water & vapour) cooling device, heat pipes offer superior conductivity.

“Heat pipe technology has become more affordable and gained popularity in thermal management design for commercial electronic products,” says Jianping Liu, heat pipe engineer specialist at Sapa Profiles Shanghai, adding that Sapa's product development team has grown and gained expertise in heat pipe design, thermal simulation and thermal testing. “Sapa has also developed in-house prototyping and manufacturing capability by integrating local heat pipe supply chain and investing in soldering, assembly and inspection equipment,” he says.

**SAPA PROFILES SHANGHAI** began producing heat pipe heat sinks in late 2011 and several large telecom and power electronic companies have already shown an interest in them.

One of these companies is the China-based Rongxin Power Electronic Co. (RXPE), which chose Sapa's heat pipe solution for its commercial solutions. RXPE is a listed company that produces mainly medium-voltage power electronic equipment.

Hao Wang, senior mechanical engineer at RXPE, says that the new solution can be easily applied to its electric power devices. “The heat pipe solution improves the heat dissipation capability of the heat sink without any construction update or the need for an additional device,” he adds.

TEXT CARI SIMMONS



### Heat pipes

A new solution from Sapa bonds heat pipes to heat sinks for enhanced thermal performance. The super conductive sealed pipes quickly transfer heat from one point to another. Copper heat pipes combined with extruded aluminium heat sinks are an ideal solution for industries looking to improve thermal efficiency.

## Advantage Cressona

A fully automated CTL (cut to length) work station entered service this year in Sapa's Cressona Plant in Pennsylvania, USA. The new facility was set up for the manufacture of ABS blocks for Bosch, a leading supplier of brake systems to the car industry. The work station can produce up to 3.2 million units, a precision extruded and cut block of 9003 Kobi aluminium alloy later machined by the customer.

"This is a high volume operation. The possibility to use an automated process give us an

edge over our competitors. We have a low cost manufacturing solution for a very complex and demanding product," says Kevin Stuban, director of Fabrication at Sapa North America. "It is the first time we use this type of manufacturing and we are ready for new challenges," he says.

The ABS blocks manufactured for Bosch are mounted in the brake system of cars and light trucks all over North America, a market for ABS blocks of 12 million units/year.



years: the age of the oldest aluminium products that are still in use. They include the Shaftesbury Memorial Fountain at Piccadilly Circus and the San Gioacchino dome in Rome.



## A SHOWCASE FOR ART AND DESIGN

When renowned Italian architect Renzo Piano was commissioned to design Vandalorum, an international art and design centre in southern Sweden, he took to the sky by helicopter for a bird's eye view of the region.

"The landscape is peppered with red storage barns, which inspired Vandalorum's wood facades", explains Göran Almqvist, sales manager at Flex Fasadia AB, which supplied the centre's building systems. "But light was obviously another important element.

There had to be lots of it, but also of the correct type so as not to damage the artwork. We couldn't risk failure with this part of the project so we called on Sapa Building System AB. We've had good experience with their products and they understand building systems."

"We also wanted maintenance-free door and window supports. Aluminium requires virtually no upkeep, and its modernistic look was in keeping with the design aesthetic."

Vandalorum opened in April 2011.

## Safer ground work with aluminium shields

Australian Lite Industries entered the UK construction market offering its lightweight modular systems for ground worker protection. For instance, the popular Trench Shield built on structural grade aluminium profiles that give the system the strength of steel but a fraction of its weight. Because they are lighter, aluminium shields are easy to transport and put together and are not affected by corrosion or contaminated soils.

Entering the UK, to find a reliable aluminium profiles provider was crucial for Lite Industries: "Transporting products from the other side of the world would be time consuming and very costly, so UK manufacture was an essential requirement for us. At Sapa UK we found the synergies we were looking for," says Mike Davies, managing director of Lite Industries' UK operation.

"In addition to their own aluminium extrusion capabilities and fabrication facilities, the technical support has proved to be invaluable in helping to 'fine tune' our products for the home market."

# SHINING RELIABILITY

Juwi's solar plants around the world will have panels fitted on aluminium mountings built from Sapa profiles.



### Juwi in short

Founded in 1996 as a wind energy projecting firm, Juwi has its headquarters in Wörrstadt, Germany, and 15 offices in Europe, Asia, Africa and the Americas. It has more than 1,700 employees and sales of approximately one billion euros (2011). Juwi is present in the renewable energy fields of solar, wind and bio energy as well as hydro and geothermal power.

### The Juwi requirement list

- Product development support
- Innovation for increased efficiency
- Very tight tolerances
- Big volume, fast deliveries
- Worldwide presence

Juwi is a German giant in renewable energy, a leading world player in wind, bio and solar energy. Their track record in solar energy, the greatest and most challenging source of green energy, is impressive: it is close to one GW generation power in large free-field and roof top plants all over the world. Juwi has long experience in planning photovoltaic projects of different sizes and offers a wide range of competencies in terms of engineering, procurement and construction.

"Juwi Solar covers the complete chain, from financing to managing, and one of our main strengths is our reliability. We are now close to the 2,000th solar project and all of them are finished and are running as expected", says Michael Löhr, communications manager at Juwi.

Sapa has been supplying aluminium profiles to Juwi since 2010. They build the mountings of the solar panels and both companies worked together developing Juwi's own design from scratch. The cooperation includes manufacturing challenges as well as high volumes and represents, according to account manager Jens Leppin at Sapa, a great example of doing it right from the beginning.

"The market is obsessed with price reductions, bonus and other benefits. But the greatest benefits come from getting an early start, building up trust and knowledge. Juwi trusted us as extrusion experts and we have helped them achieve a more efficient profile that saves them money," recalls Leppin.

"We bought 1,800 tons of aluminium profile

from Sapa in 2010 and approximately 5,500 in 2011 and the volume will continue to grow. We expect more of the same: technical know-how for product development and their support in entering new markets such as India and South Africa", Michael Löhr says.

**JUWI'S MOUNTINGS** are three metres long and include up to 10 kilos of aluminium components. They have a higher price tag compared to steel mountings, but they are lighter, more corrosion resistant and easier to set up in the field. "Aluminium profiles do not need additional machining and include functional geometries such as clip function and slots for screws, all of which saves time and money," says Hans-Jörg Oestreich, development engineer at Sapa. "We can create complicated profiles with different wall thickness and – unlike with steel – put material only where you need it for structural reasons."

No less important for a company with a green profile like Juwi, aluminium is a more environmental friendly material choice. It can be recycled at the end of its life cycle and used over and over again without any loss in quality.

"Big volumes and sophisticated profile designs demand a supplier with manufacturing muscle. Tolerances are very tight. When Juwi is click-mounting hundreds of solar panels, be it on top of roofs in a big city or in the plains of Africa, it must work perfectly. One extra penny invested in a top of quality mounting will save a great amount of money in the field," says Oestreich.

While growth in Europe is slowing down, the solar energy market will grow globally. Juwi's



Juwi's mountings are three metres long and include up to ten kilos of aluminium components.

Michael Löhr says: "We see a promising future for the industry. Technology will improve and sales will pick up on a global basis. Furthermore, I am certain that aluminium will play an important role in the future of the solar business".

This has given Sapa another opportunity to assist Juwi in the global scene. In projects where local manufacturing is prioritised – to promote local industry or avoid custom and shipment issues – Sapa will probably be there. "Our global presence gives us the opportunity to deliver quality and reliability around the world," says Jens Leppin.

TEXT ERICO OLLER WESTERBERG

# INVESTING IN CHINA

## Demand is growing

With a population of 1.3 billion, China is the biggest aluminium market in the world.

TEXT CARI SIMMONS

**DEMAND FOR ALUMINIUM** is growing, as infrastructure and buildings pop up at record speed. The Chinese rolling stock industry has seen very strong development both in terms of volume and technology and Sapa had revenues of about SEK 2 billion in China in 2010.

Despite continued strong growth in the building and transportation sectors, Sapa Chalco CEO,

Torbjörn Sternsjö says that there are now signs that the building fury is calming down, as China feels the impact of the global economic crisis. "The government is being a little less aggressive regarding infrastructure investments, but there is still good potential," he says. "Things were going too fast and I think it is healthy for the industry to slow down a little in order to recover, do quality reviews and so on."

He anticipates sales growth in aluminium profiles for the automotive industry. "Compared to Europe, China uses very little aluminium in cars, trailers and other vehicles, and we believe there is an opportunity for big future growth here," he says.

Sapa established its first company in Shanghai back in 1996, with Sapa Heat Transfer Shanghai Ltd., and the operation of a new rolling aluminium plant started in 1999. Sapa Profiles entered the market in 2004. In December 2011, Sapa bought an aluminium factory in Jiangying, 150 kilometres from Shanghai.

In April 2011, Sapa signed a joint-venture agreement with China's state-owned aluminium company, Chalco.

The joint venture expands Sapa's operations beyond Shanghai's bustling and cosmopolitan hub to Chongqing, another major Chinese city in a municipality of 30 million people.



# Chinese collaboration

It's full steam ahead for Sapa Chalco Aluminium Products, Sapa's joint venture in China.

TEXT CARI SIMMONS

**THERE WAS MUCH** applause when China's biggest aluminium company joined forces with the world's biggest aluminium extrusion company. The Sapa-Chalco (the Aluminium Corporation of China Limited) joint venture agreement was signed in April 2011, giving each party a 50 percent shareholding in the venture.

Sapa brings its management capabilities, extrusion technology and knowledge in Friction Stir Welding (FSW) to the venture, while Chalco contributes with its leading position on the Chinese aluminium market.

"The joint venture was a very good move for Sapa," says Torbjörn Sternsjö, CEO of Sapa Chalco Aluminium Products. "Customers in the transport segment are state-owned enterprises and it is difficult for foreign companies to get in the door. Together with Chalco, we have a really good opportunity to develop more business in the Chinese market, share the investment and limit our risks."

Sapa Chalco customers, mainly state-owned enterprises, will also benefit from the joint venture. "I think that these customers and their suppliers are already seeing a different attitude

and way of working," says Sternsjö. "We believe very much in listening to our customers and meeting their demands. There is a lot of competition among suppliers and we are working on an increased customer focus within our new organisation. Customers are expecting better services and product quality from this venture and we want to deliver that to them."

Construction is currently underway on a state-of-the-art aluminium extrusion and fabrication facility, as well as facilities for research and development. The total investment, which comprises the latest in extrusion, press and fabrication technology and capabilities, will be almost 70 million euros.

**THE NEW FACILITY** is being built in Chongqing, a rapidly developing city in Southwest China. It will be ready in early 2013, until then, Sapa will use Chalco's current production facilities and welding operations. Sapa's Friction Stir Welding machine is already up and running so the company can start filling orders, especially for long profiles for the rolling stock market.

According to a five-year plan for 2011-2015, investments in the railway industry will total approx 3.5 trillion Renminbi (377 billion euros). The China Railway high-speed network is expected to extend from 13,000 kilometres by the end of 2012 to 18,000 kilometres by the end of 2020.

Although there are signs that China's ambi-

tions for domestic railways are tapering off somewhat due to political and financial issues, Sternsjö is confident that demand for rolling stock will continue to rise. "We also expect demand for rolling stock to grow with investments outside China. This means that Sapa Chalco can follow its Chinese customers when they expand outside the country too."

**AS WITH ANY** joint venture, pulling this one together was a complicated process that required about a year of discussions and negotiations to complete. Both companies are big and share some similarities, but there were also major differences. Chalco is state-owned, whereas Sapa is owned by Orkla, a private Norwegian company. "Chalco is not as market-oriented as Sapa and the business is sometimes a little protected," Sternsjö says.

Joint ventures between two cultures don't always last, but he is confident about Sapa Chalco Aluminium Products. "What makes me optimistic is that there is very good team spirit. Also, Chalco has recognised Sapa's management capabilities and wants to work accordingly," he says. "I think we are in a very good position to make this joint venture a successful one."



The 11th of November 2011, many top managers from Sapa, Chalco and Chongqing government participated in a ceremony.

## The People's Republic of China

The People's Republic of China, commonly known as China  
**Capital:** Beijing  
**Population:** 1.3 Billion (2005)  
**Land Area:** Approximately 9.6 million square kilometres



A part of a metro car body, made of several kinds of profiles.



Opening a package with profiles.





# HONORARY CITIZEN

**TORBJÖRN STERNSJÖ** got stuck in China. Three years became 13 and recently he was awarded for his achievements.

**SAPA CHALCO'S CEO TORBJÖRN STERNSJÖ**, thought that he might someday spend a little time working abroad, but the Norrköping, Sweden native never dreamed that he would live in China for so many years.

"I said 'yes' in 1999 to an offer to work as General Manager and start up Sapa Heat Transfer in Shanghai," he says. "My contract was for a maximum of three years, but I got stuck here!"

Today, Sternsjö is the CEO of Sapa Chalco Aluminium Products (see article on page 7-8) and he is in the process of re-locating from Shanghai to Chongqing in Southwest China.

The move takes him to yet another new environment – one that is quite different from the cosmopolitan Shanghai that he has become familiar with. "Chongqing is also a big city (10 million people and 20 million including the surrounding areas), but it is perhaps 10 years behind Shanghai in many aspects," he says. "There is a 'go west' attitude towards Chongqing and a desire to develop this part of China where there are new market opportunities and lower costs."

**"We were really pioneers when we came to China in 1999."**

"The entire country is being transformed", he adds. "There is a real entrepreneurial spirit here and things are constantly changing. It's a very dynamic environment where there is constant activity and at the same time, opportunities to meet many different people and learn new things. At the same time, it can be difficult to keep up with such rapid changes."

**TRYING TO KEEP UP** generally means working too much, which Torbjörn Sternsjö says is common for most people living abroad and working for a foreign company.

Due to the time differences, expats tend to work in the day and be interrupted by telephone calls and emails in the evenings, he says. "As the work becomes more and more global, many people are expected to be available 24 hours a day."

But the hard work has paid off. Sapa has been able to grow with the market and maintain a high market share despite tough competition.

"We were really pioneers when we came to China in 1999," says Torbjörn Sternsjö. "There was no competition, but we struggled with what was then a very small market for our products. At that time, there were under a million cars produced, but today, the country produces 16 million cars a year."

He can also be proud of a personal achievement: In 2010, he received Shanghai's Honorable Citizenship Award. The award, granted by the Shanghai City Hall, honors expatriates who have contributed to the development of the city.

Torbjörn Sternsjö describes himself as energetic in business, but oth-

erwise relaxed, and says today, his management style is a combination of Swedish and Chinese ways. "Some people from Sweden may think I'm too authoritarian, while the Chinese may think I'm too Swedish – on the cautious side and concerned about consensus!"

**HE HAS LEARNED** some Chinese, but says that fortunately for him, being "more of an engineer than a linguist," English is becoming increasingly popular among his suppliers and customers. "The Chinese are quite open and ambitious and they want to learn new things, especially English," he says.

And miscommunication is not always a matter of language, he points out. "It's a matter of understanding behaviour too. When I was working as general manager, it was important for me to surround myself with good local management as it was sometimes hard to understand the Chinese business codes and what people really meant."

As an example, he points out that the Chinese are often less direct in their communication with foreigners, as they don't want to cause embarrassment or offend. Moreover, personal relationships are very important for doing business in China, while business is a little more impersonal in the western world.

Nonetheless, after all of the years in China, Torbjörn Sternsjö has adopted some Chinese ways: "Now I'm also rushing into elevators before people come out," he says laughing. "Rushing into an elevator or onto a bus without queuing is typically Chinese."

He adds that this trait probably comes from the competitive environment in China, where no one wants to be left behind. "But I think China will see a change regarding this," he says. "There is still a huge population and there will still be tough competition for some time, but I think the Chinese are becoming more international – or perhaps 'urbanized' is a better word to describe it."

TEXT CARI SIMMONS

PHOTO NIKLAS BJÖRLING

## Torbjörn Sternsjö, CEO Sapa Chalco

**Age:** 53

**Home(s):** Shanghai and Chongqing China

**Family:** "Still single."

**Leisure activities:** Seeing friends and colleagues, golf (a big sport in Asia), participating in Chamber of Commerce activities.

**Favourite food:** Chongqing food, which is quite spicy

**Languages:** Swedish, English, basic Chinese

## LET THE SUNSHINE IN

BC Place in Vancouver was the location of the opening and closing ceremonies for the 2010 Olympic Winter Games and it is the home arena to the city's Canadian Football Team, the BC Lions, and the MLS Soccer Team, The Vancouver Whitecaps. Many in this city probably miss the air-supported roof of this stadium, a landmark until it broke and was deflated, and the largest of its kind in the world.

But the new roof being built now looks astonishing and when inaugurated, in a few months, it will bring a new record to Canada: the largest cable supported

retractable roof on Earth. Hightex, a global contractor in the field of tensile engineering—with a track record that includes World Cup stadiums in South Africa, the Bangkok Airport and Wimbledon's center court—will supply the entire retractable inner roof of 6,700 m<sup>2</sup> approximately.

Sapa has delivered over 15,000 metres/55,700 kilograms of aluminium profiles mostly anodised, welded & fabricated for this project. Hightex builds fixed facade panels around the inner roof, stretching 6,000 m<sup>2</sup> of transparent ETFE membrane, that will let the sun in and keep the rain and the wind off the arena.



BC Place in Vancouver, home of the city's Canadian Football Team, the BC Lions.

# EASY BICYCLE PARKING

The challenge for me – as a designer – was to create a bike parking system that would look like a consumer product. While other systems resemble mechanical traps, ours had to stand out and be userfriendly with soft shapes and smooth aluminium surfaces,” says Feiko Withagen, senior designer at Dutch manufacturer VelopA.

Judging by market response, he succeeded. Not only that VelopA obtained a contract to provide its new double deck parking systems adjacent to the train stations of the Dutch Railways network in Netherlands. Easylift+

has been awarded the prestigious Red Dot Design Award and the company is getting requests from several European countries.

There were many reasons to chose aluminium for this construction: less weight, the possibility to integrate functions to the profiles within precise tolerances and the right finishing of the surfaces. “As a matter of fact we never considered using another material,” recalls Withagen. “Sapa in the Netherlands is our preferred supplier of aluminium profiles and they gave us valuable advice during the engineering stage.”

TEXT ERICO OLLER WESTERBERG



**Did you know?** 40 percent of all traffic movements in the Netherlands is by bicycle. In 2011 over 1.7 million bicycles were sold in the country.

You will find more bicycles here than residents and more than 20,000 kilometres of cycle paths.



## New framing solutions



The aluminium edge frame provides high impact strength.

Sapa was chosen by Twinfix (UK) to assist with the development of the profiles used with the new 500 mm Lexan Thermoclick polycarbonate panels in vertical glazing applications. The beauty – and the challenge – of this system is that the panels click together through groove and tongue connections. They fit into a thermally broken aluminium edge frame with no vertical profiles to cast shadows, providing both exceptional light transmission and high impact strength.

“The Thermoclick Glazing Bar project is an excellent example of cooperation between us, the system manufacturer and Sapa UK, our chosen profile supplier”, says Martin Fleet, director at Twinfix.

“We pride ourselves on having an enviable reputation for the supply and installation of innovative glazing solutions and this reputation has been earned, in part, by the working relationship we have with the Technical team at Sapa in the United Kingdom and the technical competence that they bring to the equation.”

## Less fuel, more load

Aircraft manufacturers and engine designers are not the only ones who strive to shave weight at the design stage. Maximising cargo weight and minimising gross weight are ideals in the freight industry, and aluminium structures are playing a bigger and bigger role.

“Everyone uses aluminium today, but in the late seventies we were pioneers,” explains Johan Pettersson, purchasing manager with Sala Kaross, part of the Amymone industrial group.

“We prefer to build in

aluminium than steel. Our niche is mainly distribution bodies from 12 tonnes upwards,” he reports.

Sala Kaross has made a name for itself in the industry through its custom solutions. The company builds truck bodies with different temperature zones, adjustable body heights and other solutions that simplify cargo handling, such as opening sides.

“Most of our range is based on Sapa profiles. When we're developing new products or solutions we turn to Sapa to get the profiles we need,” says Johan Pettersson.



## RIGHT LIGHT FOR A GREENER SECTOR

Fionia Lighting is set to achieve a technological shift in the horticulture industry. Through **LED lighting** this Danish company offers to professional greenhouse owners great energy savings as well as the opportunity to greatly reduce their environmental impact.

LED lighting might not be a novelty anymore. But the width of its fields of application certainly is. The luminaries of Fionia Lighting – a research company related to the University of Southern Denmark – are a bright example. After five years of research and product development, Fionia is launching its LED-lighting fixtures that will save up to 40% of the energy required by conventional lighting systems.

“Cost savings are our main selling point. A producer that spends two or three million euros a year in electricity will be very interested in a system that demands 40% less energy and has lamps with five to six times longer service life,” says Thomas Rubaek, project leader at Fionia. “But the fact is that LED lighting is also better for the plants, because of its photosynthesis-friendly light range, and it is better for the planet, reducing CO<sub>2</sub> emissions and the use of chemicals.”

Horticulture LED-lighting is actually competing with technologies of the past. Besides some fluorescent and filament, most greenhouses recur to High Pressure Sodium lamps. It has been the best choice since a long time despite the fact that more than 70% of the energy they consume ends in useless infrared light or in heat.

“Fionia is the pioneer of LED-lighting in the field of nursery gardens. We were the first in R&D and if we were not the first on the market it was simply because we wanted to reach the market with mature technology and a well-tested product. And we are there now,” says Rubaek.

An average Fionia luminaire is a complex piece of manufacture including up to 300 LEDs. The light system of a single industrial greenhouse may comprise 500 luminaires with about 1 50 000 LEDs. It is a large investment for the producer and the expectations are very high.

The beauty of this new technology is that the investment will quickly pay for itself.

Cooling is crucial in all LED applications and it was one of the challenges Fionia Lighting had to solve before reaching the market. Sapa Profiler A/S in Denmark got involved at an early stage and could provide the required solutions.

Fionia had been working on a water cooling design that proved to be too heavy, complicated and expensive. Soon they were considering an air cooling solution presented by Sapa.

“Sapa has cooling engineers with lots of experience. The staff are well prepared and they can take the initiative, think out of the box and meet the requirements,” says Thomas Rubaek, project leader at Fionia.

Jonas Bjuhr, Global Application Development at Sapa, is happy about this cooperation too. “It represents a breakthrough for us as well. With this new manufacturing technique where cooling fins are pressed together, Sapa can now offer heat sinks with extreme fin ratios. It would not have been possible to produce these shapes in a one-piece extrusion.”

High fin density heat sinks are being used in a fast growing number of applications and Sapa has shown it has the know-how and the capacity to deliver very advanced cooling solutions adapted to the customer's needs.

TEXT ERICO OLLER WESTERBERG

### About Fionia Lighting

Fionia Lighting A/S is a spin-out company from the University of Southern Denmark (SDU) that contributes to the development of sustainable energy efficient greenhouse lighting. It was founded in 2007 and was awarded the 2009 Spies Foundation Climate Award to innovative climate projects. Through the sales and distribution net of climate-control company Senmatic, one of its owners, Fionia aims to conquer a growing share of a global market of approximately two million luminaires/ year for horticulture lighting.

# Winds of CHANGE

As an emerging technology, wind power offers many opportunities for product innovation.

Wind turbines are usually made of steel and glass-reinforced plastic (GRP). But as competition within this product sector increases, wind turbine manufacturers are

looking for ways to reduce product costs. Aluminium's relatively low weight, high malleability and low maintenance requirements are attracting the attention of wind turbine producers. And Sapa is there to support them in their transition to aluminium profile solutions.

### GEARLESS TURBINES

#### Putting know-how to work

Gearless turbines utilise a different cooling system than gearbox turbines. So when Leitwind, a gearless wind turbine specialist, sought a partner to develop a specialised heat exchanger for their direct drive turbine, they turned to Sapa.

Applying years of cooling and heating expertise, Sapa combined the excellent thermal conductivity of aluminium with fabrication know-how to create a fully-customised heat exchanger for Leitwind's direct drive generator.

As a one-stop supplier, Sapa assumed complete responsibility for the entire supply chain from extrusion, additional fabrication, welding or brazing, and leakage testing to logistics. Sapa and its internal and external partners scrutinised each step of the process to optimise added value and to assure the development and delivery of a reliable, fully tested, totally finished product that completely fulfilled Leitwind's special requirements.

#### ALUMINIUM PROFILES FOR:

1. Busbars, instead of copper
2. Nacelle covers
3. Nacelle floors
4. Structural parts
5. Cooling
6. Tower platforms

### BLADT INDUSTRIES

#### Looking good!

**BLADT INDUSTRIES**, an international steel contractor that provides steel solutions for wind

energy and other industrial sectors, needed a climate shield for a mega transformer in Denmark's Rødsand 2 offshore wind field, which is visible from land. The shield had to be not only lightweight, durable and corrosion-

resistant but also look good. Working quickly, Sapa designed and supplied the profiles, machining and surface treatment for a highly sophisticated yet aesthetic solution.

TEXT MICHELE JIMÉNEZ



# ENERGIZING OREGON

It feeds clean, solar energy into the electricity grid and offsets over one-third of the energy needed for highway illumination on site – **America's first solar highway project is well underway in Oregon.**

**S**he flies with her own wings is the motto of Oregon, a rugged American state divided by mountains and bordering the Pacific Ocean. Now, the independent Oregonians have grabbed the reins on solar energy, investing in the country's first solar highway project.

A 6,994 panel solar array, located 30 miles (48 kilometres) south of the city of Portland, is designed to produce some 1.97 million kilowatt-hours of clean, renewable energy annually. The Baldock Solar Highway Program, which is a part of Oregon's solar highway program, will be completed in early 2012. A portion of the energy generated will be used for the operation and maintenance of the state highway system, including powering the Baldock Safety Rest Areas. The solar array will also provide energy for 165 homes in the neighbourhood.

Sapa provided all of the aluminium components, along with fabrication and assembly, for the Baldock Solar program's Photovoltaic (PV) mounting system, supplied by HatiCon Solar. Sapa also produced the fabricated aluminium profiles that frame each photovoltaic module made locally by SolarWorld.

"By using Sapa's aluminium profiles, HatiCon Solar was able to design optimal shapes to maximise strength while reducing material consumption," says Eduardo Lainez, Sales and Marketing Coordinator, HatiCon Solar. HatiCon Solar prefers to use aluminium for its anti-corrosion properties and its versatility as well.

**DEDICATED PRODUCTION** and project management resources ensured that all components were manufactured to the correct specifications and delivered to the jobsite in accordance with the project schedule, says Hedman, Manager, Sapa's North American Technical Center. "Sapa



Sapa provided all of the aluminum components, along with fabrication and assembly, for the mounting system, supplied by HatiCon Solar.

Portland's Fabricated Components division also provided many sub-assembled and kitted components to the jobsite, significantly reducing the time required for installation."

**SAPA IS A MAJOR PLAYER** in the PV solar industry, providing extruded aluminium products for mounting systems, module frames, inverters, and other peripheral components for solar installations in North America, Europe and Asia. "Sapa's extensive experience and knowledge, as well as unmatched production, fabrication, project management, and technical resources make them a preferred partner for the solar industry," says Peter Hedman.

Roadside solar highways, similar to the Baldock program, have been operating in Germany and other countries in Europe for more than 20 years, but the Oregon project marks a first for the U.S.

"Projects like the Oregon Solar Highway show how underutilised public land can be used to produce and maintain our national infrastructure," says Lainez. "Many states, including California are studying where solar farms can be installed."

The future is looking brighter for solar energy.

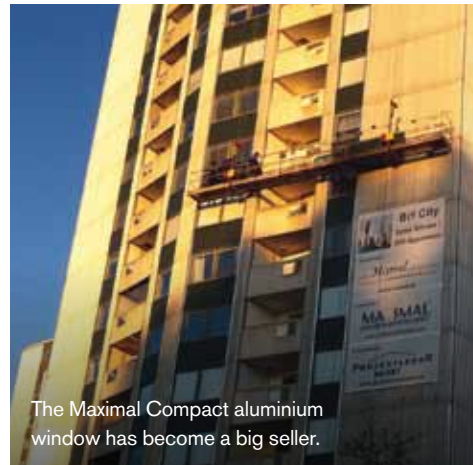
TEXT: CARI SIMMONS

## Zero-emission street lighting

Danish-based Scotia designs and supplies solar street-light systems that generate renewable energy and helps cities achieve the environmental goal of zero-emission street lighting.

Scotia's products include the SunMast, Europe's first grid-connected, solar-powered street light designed to generate more power than it uses. It collects energy and feeds it back into the grid, enabling clients to earn money and reduce carbon emissions, while lighting streets and highways. The SunMast was first installed on the site of the 2009 Copenhagen Climate Conference to demonstrate the feasibility of zero-emission street lighting. Scotia has subsidiaries in the UK and Italy and is also represented in Spain and Germany.

SAPA in Denmark has played an important role in developing the SunMast. "We have experienced that the complete SAPA organisation contributed widely in all fields, as logistics, construction and of course manufacturing expertise. The strong teamwork with SAPA has ensured that today we are unique with the only fully CE certified solar street-light in the market," says Heine Olsen, business development director at Scotia.



The Maximal Compact aluminium window has become a big seller.



## Maximal Success

Maximal Compact is the name of a window that has been a real sales success for Swedish window-maker Maximal Aluminiumfönster. Popularity is due to its all-aluminium construction (with the exception of thermal barriers in composite), which fulfils a long-term dream of renovation specialists: the ability to replace an old window with a modern new window without having to replace the old casement or reduce glazing area.

This means an enormous benefit for landlords and housing companies with large property portfolios.

"Replacing a window with our Maximal Compact takes just 70 percent of the time needed for conventional window replacement. You eliminate exterior damage and you don't have to compromise on glazed area," says Christer Bäck, Sales Manager and co-founder of the company.

The choice of material was critical to product development, since the construction required a combination of strength and compact design. Sapa was entrusted with manufacturing and supplying the aluminium profiles for the product, which were designed by the window-maker.

## Focus on safe roads and runways

Soft and forgiving but as strong as steel. And just a third as heavy.

Norwegian manufacturer Lattix has, since the mid '80s, developed and produced lightweight trussed aluminium masts that can be seen along motorways in eight countries and in the vicinity of 200 airports around the world.

"Our system is like a Lego that gives us the flexibility to offer our masts for a great range of applications, from single road signs to highway gantries

and runway approach lights," says Kim Heglund, Lattix managing director. "These masts are collision safe, completely recyclable and easier to transport since they are lighter and assembled on site."

Lattix and Sapa have a history of close cooperation. And the rough Norwegian coast was the first place where the aluminium alloys of the profiles showed the world they could withstand the challenge of time and adverse weather.



"Our system is like a Lego that gives us the flexibility for a great range of applications"

# SUSTAINABILITY: NOT AN OPTION ANYMORE

It might have been a trend once, but policies of **social and environmental responsibility** are here to stay. And now, Sapa is intertwining its sustainability practices with suppliers and customers.

**MORE THAN HALF OF** multinational companies are reporting their acts in the field of social responsibility and environment. In a globalised world, following principles of sustainability has become critical to a company's credibility and endurance.

Ye Yan, a development engineer specializing in sustainability at Sapa Heat Transfer, sees the growing interest in both environmental as social sustainability as a logical development. "It is obvious that providing a good working environment and good relations with the local community is good for a company's operations," she says. "And it is logical that energy saving processes as well as investments in renewable energies and energy saving products are encouraged, taking into account that we have limited resources and growing prices."

Sapa Heat Transfer is now working actively in the integration of sustainability along a Sustainability Value Chain, promoting coope-

ration with suppliers and customers. A recent workshop organised by Sapa in Sweden gave the company the opportunity to share and discuss these issues with customers and researchers. Replicating a sustainability value chain, Sapa Heat Transfer was joined at its workshop by TitanX, a global heat exchanger supplier for commercial vehicles and off-highway markets, and Volvo Construction Equipment, one of the world's largest manufacturers of construction machines. The Blekinge Institute of Technology (BTH), where Sapa is sponsoring research projects related to sustainability, also took part in this event. BTH presented research related with its Master Programme of Sustainable Product Innovation.

**"WE SHARED THE PERCEPTION** that consumers and the public in general are pushing sustainability,

## A sustainable Sapa Heat Transfer

"We implement sustainable development at two levels: organisation and product. To create a sustainable organisation, we focus on working in harmony with local communities, building stable and trustworthy relationships with customers and suppliers, improving operational efficiency, and creating a better working environment for employees. At product level, we strive to work with sustainable product innovation, such as increasing recycled aluminium as raw material, while maintaining competitive product performance."

## Three musts for sustainability

- To increase awareness in the internal organisation
- To engage and cooperate with suppliers and customers
- To develop sustainable innovation to ensure competitiveness



Ye Yan, Development Engineer, focusing on Sustainability at Sapa Heat Transfer.

keeping an eye on the environmental impact, the energy consumption and the social performance of companies and their products. This public engagement is driving change," says Ye Yan commenting the output of the Sapa Heat Transfer sustainability workshop.

It was also evident that sustainability must be built up along the whole value chain. "From 'cradle to grave' perspective, the sustainability of a product it is not only determined by its design or manufacturing methods but also by the sustainability of the suppliers of raw materials and components used to produce it," says Ye Yan. "In that sense, Sapa has a privileged position taking into account the high percentages of recycled aluminium used in our manufacturing processes," she explains.

TEXT ERICO OLLER WESTERBERG



When it comes to **"green" certification**, there are no bad products, just bad design, say German chemist **Michael Braungart** and U.S. architect **William McDonough**, creators of the world's leading **cradle-to-cradle** certification program.



The Cradle to cradle-logo.

**M**ost approaches to sustainable development seek to minimise human impact on the environment. Cradle-to-cradle (c2c) design, however, strives to increase the positive effects of human activity and manufactured products through proactive design, with no residuals for disposal at the end of product life and no loss of quality in materials that are remade into the same or new products.

Or as Braungart and McDonough put it, 'waste equals food': If a product is properly designed, at the end of its useful life, it can be broken down into its basic elements, which become the 'nutrients' for new products. Instead of less waste, the goal is no waste. In the c2c model, product materials circulate in an endless cycle with no net effect on the environment.

To date, more than 200 companies worldwide have received c2c Certification.

**A NUMBER OF EUROPEAN CITIES** and municipalities, including the Dutch province of Limburg, have embraced c2c sustainability as a strategy to not only protect the environment but to also strengthen people's welfare and economic prospects through new business opportunities. This correlates well with Sapa's own approach.

"Our goal is to serve the customer including those who demand environmentally-friendly materials and green energy and to help them meet their environmental targets. We are, in fact, the first aluminium supplier in the world to offer c2c-certified lighting columns," says Nicole le Sage, marketing communications, Sapa Pole Products, the Netherlands.

**C2C DESIGN IS A CONTINUOUS** process of development and improvement. As part of this effort, Sapa Pole Products is launching a take-back program in 2012 to offer a full service package to customers: At the end of product life, Sapa will collect obsolete lighting columns and reprocess the metal into new ones, thereby completing the technical loop and taking another step in support of c2c sustainability.

TEXT MICHELE JIMÉNEZ



# BUILDING UP ANGOLA

After nearly three decades of civil war, Angola is rising from the ashes, and Sapa Building System is taking part in the renewal.

**BUILDING CRANES ARE** going full speed in Angola's capital city of Luanda as exports of diamonds, gold, and barrels of oil, help fuel the current construction boom. Angola has the fastest growing economy in Africa and many foreign companies, faced with financial downturns at home, are entering this lucrative market. For Portuguese companies in particular, the former colony has become an attractive place to do business.

Sapa Building System in Portugal has worked on many projects in Angola. One of the most recent projects is the Sky Business building, currently under construction in Luanda. Sapa has supplied the aluminium curtain wall solution for the 25-storey, 100 meter-high office building. Located in the new Sky Center complex, it will share a common two-storey basement with a residential building.

Sapa was invited by Teixeira Duarte, the main contractor on the Sky Center project, to provide the curtain wall solution. Sapa and Teixeira Duarte had worked together on previous projects and the contractor turned to Sapa once again for its expertise and help.

"The challenge was to develop a solution in aluminium instead of steel, which was originally planned as the outside skin of the building," says Sapa Marketing and Sales Manager Pedro Maçarico.

**SWITCHING FROM STEEL** to aluminium brought with it enormous cost savings, as it enabled a standard building process using concrete, thus eliminating the need for a complex and expensive steel structure for the building. At the same time, the aluminium structure had to maintain the same aesthetics as the original design in steel.

"Sapa was crucial to 'saving' our design," says Luís Torgal, of Risco Architects, responsible for the building design. "When the client realized the steel structure would cost a lot more, we were really frightened. We could have ended up with a banal glass façade, but Sapa did a great job of finding solutions to keep things as close as possible to our original design."

The resulting Elegance 52 curtain wall system with solar shading was adapted to meet the unique specifications of the building. "Sapa makes a big effort to conceive solutions that match our ideas," Torgal adds. "They realize that architects can design intelligent stuff. Not all brand companies are so open to working with architects that want to change – or adapt – their products."

Hanging the solar shades on the curtain wall put Sapa's designers to the test.

"At 40 centimeters deep and five centimeters wide, the structure was creating a 'wind sail' effect," says Maçarico. A very strong and

reliable anchoring device was required to prevent shades from breaking loose during a strong wind.

"Another big challenge was figuring out how to stick the aluminium structure to the curtain wall and still enable maintenance and thermal insulation," Maçarico adds.

Sapa's fast and efficient work put the Sky Business building's construction ahead of other buildings within the same project. Completing projects in as short a time as possible is extremely important, especially in Angola where the cost of living is high even for foreigners, says Maçarico. "Everything costs ten times more in Angola than in Europe, and when you have to relocate an installation team, you want to shorten the process to keep the costs down as much as possible."

Sapa has worked on many projects in Angola, collaborating closely with architects and contractors to tailor-make solutions that suit their needs. "Working in Angola can be hard as so much can go wrong," Maçarico says. "But it helps that Sapa has experience from working in Angola and knowledge when it comes to logistics, maintenance, assembly, and more."

TEXT CARI SIMMONS

## Angola

Located on the West coast of Southern Africa, Angola was under colonial rule until November 11, 1975, the date on which it became an independent nation.

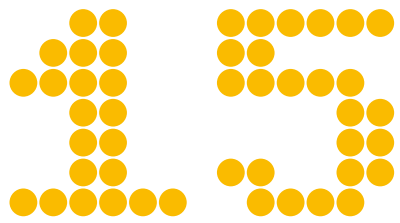
**Capital:** Luanda

**Population:** 11,177,537 (July 1999 est.)

**Land Area:** 1,246,700 square kilometres



## IN BRIEF



million: the number of tea light cups that Swedish children have collected in the Big Tea Light Hunt. This represents around ten tonnes of aluminium. Over 18,000 children took part in the competition. It was won by year-three children from a school in Skåne.



### PUTTING A SHINE ON SCIENCE

Inspira Science Center in Sarpsborg, Norway on the main road to Oslo is hard to miss. Its stunning glass and aluminium exterior is emblematic of the newly inaugurated centre's focus on sustainability.

Glass and aluminium are perfect building materials for energy-efficient structures. Both materials are completely recyclable, and Sapa's 4150 sx (facade) and 1074 sx (windows) aluminium profiles easily support the massive three-pane windows that let in lots of light but are highly energy efficient – approximately 0.8 w/m<sup>2</sup>k. The windows also insulate against ambient highway noise. "Sapa gave us all the help we needed with technical aspects of the project. We had very good dialog with the company," says Jørgen Slydahl, project engineer with Saint-Gobain Bøckmann, which supplied the centre's facades



### A cultivating environment

Solardome Industries is the market leader of glass and aluminium geodesic domes in the United Kingdom and has been working hand in hand with Sapa Profiles to manufacture their maintenance-free aluminium frames for 20 years. The domes are a striking alternative to a greenhouse and have a variety of uses, from domestic garden covering to educational tropical plant enclosure. The education market is particularly important for Solardome Industries and their range of domes for this sector is expanding rapidly. Both primary and secondary schools benefit

from the domes, which provide a unique, hands-on learning environment for all subjects from science to geography.

All of the domes use the same aluminium frame and therefore only require one profile for the aluminium struts, which are then cut to size on site. The dome is maintenance free as the frame uses aluminium throughout along with four millimetre toughened glass, making the structure wind and storm resistant, as well as a uniform and pleasant temperature internally.

### Seamless surveillance

Geutebrück is a renowned manufacturer of high-end video security systems. Its signature is the seamless integration of existing systems with advanced digital technologies together with an outstanding man-machine interface, all under a proud "Made in Germany" quality stamp.

Logistics managers wanting to follow shipments through large premises, casino staff demanding fast and easy monitoring to expose any cheating without interrupting the flow of play, or retail marketing managers observing customer purchasing behavior are among those who want to operate video security

systems easily and intuitively. The new Pilot console is an example of how Geutebrück is able to offer that.

Sapa has since long supplied the sophisticated anodised aluminium profiles that build the front of Geutebrück products and has taken part in the development of the new Pilot system. "We involved Sapa's technical and sales staff from the beginning and they provided us with the solutions we needed to address some form and conductivity issues," recalls Arno Lentz, Geutebrück, Teamleader Platforms & System Integration.



A video security system needs to be easy to operate. German company Geutebrück has developed a new Pilot system.

# Let there be light

Five different specially designed profiles were needed to build the massive lanterns in the entrance of the new Spira arts centre.

The Spira arts centre in Jönköping, a massive music and theatre complex that was opened in November 2011, has already become a local landmark. Five, three-metre tall glass lanterns, the heaviest weighing 1.2 tonnes, decorate the foyer and match the style and colour of the building.

The lanterns were designed by Ingegerd Råman, a glass designer. Fagerhults Belysning AB carried out the construction, a task that István Magyarovari describes as an exciting challenge.

"For one thing it was difficult realising the artist's vision of an airy minimalist construction without any bolts, screws, cables or visible joints. And then there was the practical side, such as working out how the lanterns could be serviced without lowering them to the ground or having to work at a height," he explains.

The solution was to use long rods of plexiglass and aluminium that can easily be removed for repair or to replace the built-in LED strips and other fittings. Aluminium offered the right balance of low weight and strength, and despite the tight production schedule Sapa was able to deliver the five specially designed profiles for the lanterns.



# BENNINGTON CARRIAGES ROLLS WITH THE TIME

In the mid-1960s, **Michael Mart**, owner and founder of Bennington Carriages, designed his first **horse-drawn carriage** for safe driving of the family's newly acquired ponies. Intrigued with the project and pony driving competition, the emerging sport of Driving Trial soon followed.

**C**onventional wisdom called for heavy wheels on carriages to keep them from overturning. But Michael Mart soon realised, whilst observing carriages during competition, the problem was not one of weight but design. With encouragement from the patron of the sport, Prince Philip, Duke of Edinburgh, Michael Mart worked with carriage design and developed a strong, lightweight wheel

in aluminium that looked like a traditional wooden wheel but permitted faster and safer acceleration. In 1979, Bennington Carriages was awarded a royal warrant, which it still holds today.

**“WITH PROPER DESIGN**, aluminium wheels are also better for the horse because less weight means less strain on the animal on diverse terrains such as mud and sand”, adds Sue Mart, horse-driving competitor, daughter of Michael and co-director with sister Wendy, of the family business.

Says Michael Mart, reflecting on his 30-year partnership with Sapa Profiles UK, which produces all aluminium alloys used in Bennington Carriages, ‘The people at Sapa are super and wonderful to work with – from design to production – with terrific service! Their expertise and flexibility have been integral to our development such that we’re now Britain’s foremost manufacturer of horse-drawn carriages for competition and pleasure driving.’

TEXT MICHELE JIMÉNEZ