Shape

A magazine from the Sapa Group • 1 2007

SAPA + ALCOA

READ MORE IN SUPPLEMENT

AN EYE FOR CARS

DESIGNER SIMON LAMARRE ON HIS ROLE WITH THE VOLVO C30.

- MEET OLE ENGER, SAPA'S NEW PRESIDENT AND CEO
- SLEEP SOUNDLY IN A HÄSTENS BED
- SAPA PROFILES LAUNCHED HIGH-SPEED FERRY

sapa:

A flourishing future

I have now been the President and CEO of Sapa for six months, but my experience from the company is much longer. I have been on the board of directors of Sapa since 2001 and during this period I have gained a lot of experience about and developed a positive attitude towards this fine and exciting company with so many possibilities.

The market situation for Sapa is good. During the first part of the year, demand has continued to be strong in most European markets, while the residential and transport markets continued to be soft in the US. Building System and Heat Transfer both experienced good market development. We benefit from an upturn in the economy and one of the largest challenges right now is to utilise synergies and continue to improve our results over the coming years.

Merging Sapa's and Alcoa's aluminium profile operations has been an important challenge during my first time in Sapa. The new company is presented in the special insert in this issue of Shape, which will give you a good view of the new Sapa; our future market position and the special competencies and tailor-made solutions that we will be able to offer customers all over the world.

As a direction for the new Sapa, there are a few values and guidelines that I wish to underline; I believe in a decentralised business model where production and our customers live in close intimacy. I also believe in Genesis, our operational system, as the way we work. This provides a way to build a corporate culture and to create a shared platform and it helps us to see the entire operation, from order to delivery, as a chain of events in which we add value at every stage and become an even better partner to our customers.

The new Sapa is a global leader in the aluminium extrusion business. Building on the combined diversity and strengths of Sapa and Alcoa is how we will shape the new future.

Ole Enger,
President and CEO

10

One-stop shop in Poland

Complete products represent the future for Sapa Aluminium in Trzcianka.

08

Lighter and environmentally friendlier cars are two challenges for the automotive industry.

14

Sports inspired Volvo designer Simon Lamarre.

20

FSW sped up manufacture of high-speed ferry in Hawaii.

24

Clever fly-bar guides carry stage sets at the Royal Swedish Opera.

sapa:
Shaping the future

Sapa is an international business 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 19 billion and employs around 9,000 people in companies throughout Europe, and in the United States and China. Shape is the customer magazine of the Sapa Group and is published twice annually in 14 languages. Shape is also available from www.sapagroup.com.
Editor-in-Chief: Eva Ekselius
Editor: Anna-Lena Ahlberg Jansen
Graphic design: Karin Löwencrantz
Production: OTW Publishing
Prepress: DONE

Printing: Davidsons Tryckeri, Växjö
Cover photo: Stefan Ideberg
Changes of address: Customers should inform their contact person at Sapa, employees their salary department and others the Communications Department on +46(0)8 459 59 00.

New business segment for Sapa Heat Transfer

Air conditioning in large commercial and industrial environments is a new business segment for Sapa Heat Transfer. The client is Danish company Alu Heat Exchanger.

Sapa Heat Transfer mainly works with the automotive industry, but the new contract also opens the doors to the stationary cooling unit market.

Three Sapa companies collaborated in developing the product. Sapa Heat Transfer in Finspång, Sweden, and Sapa Heat Transfer Tube in Remscheid, Germany, developed the tubes and tanks, while Sapa Technology supplied know-how in refrigeration technology. Production will initially be done in Europe, and will later also take place in China.

"Creating pleasant building environments is a new challenge for us. We also see opportunities for creating added value by offering more ready-made components for the systems," says Kennet Persson, business developer at Sapa Heat Transfer in Finspång.

For decades, stationary air conditioning systems have mainly been made with copper materials. Aluminium-based materials significantly cut manufacturing costs. Demands for more energy-efficient operation of air conditioning systems is another strong reason for changing manufacturing techniques.

Spotlights that can stand the heat

Wembley Arena in London and superstar Robbie Williams have something in common: they use lighting systems from the Danish company Martin Professional, a global leader in computerised lighting.

Regardless of the lighting system's size and application area, the bulbs in spotlights generate a lot of heat and need cooling down. This is done with aluminium cooler profiles.

If the spotlight is to be installed outdoors, it also has to be corrosion-proofed.

"Aluminium is an extremely effective heat conductor, and Sapa has a lot of know-how in integrating functions in an aluminium cooler's profile," says Hans Christensen, sourcing manager at Martin Professional.

Martin Professional and Sapa have jointly designed cooler profiles for two spotlight models for lighting buildings so far, and both companies are keen to develop this collaboration.

Sliding doors with an exciting design

Today's strong interest in interior design has increased demand for designed sliding doors. Prisma is a new line of sliding doors from Elfa with profiles in natural anodised and veneered aluminium.

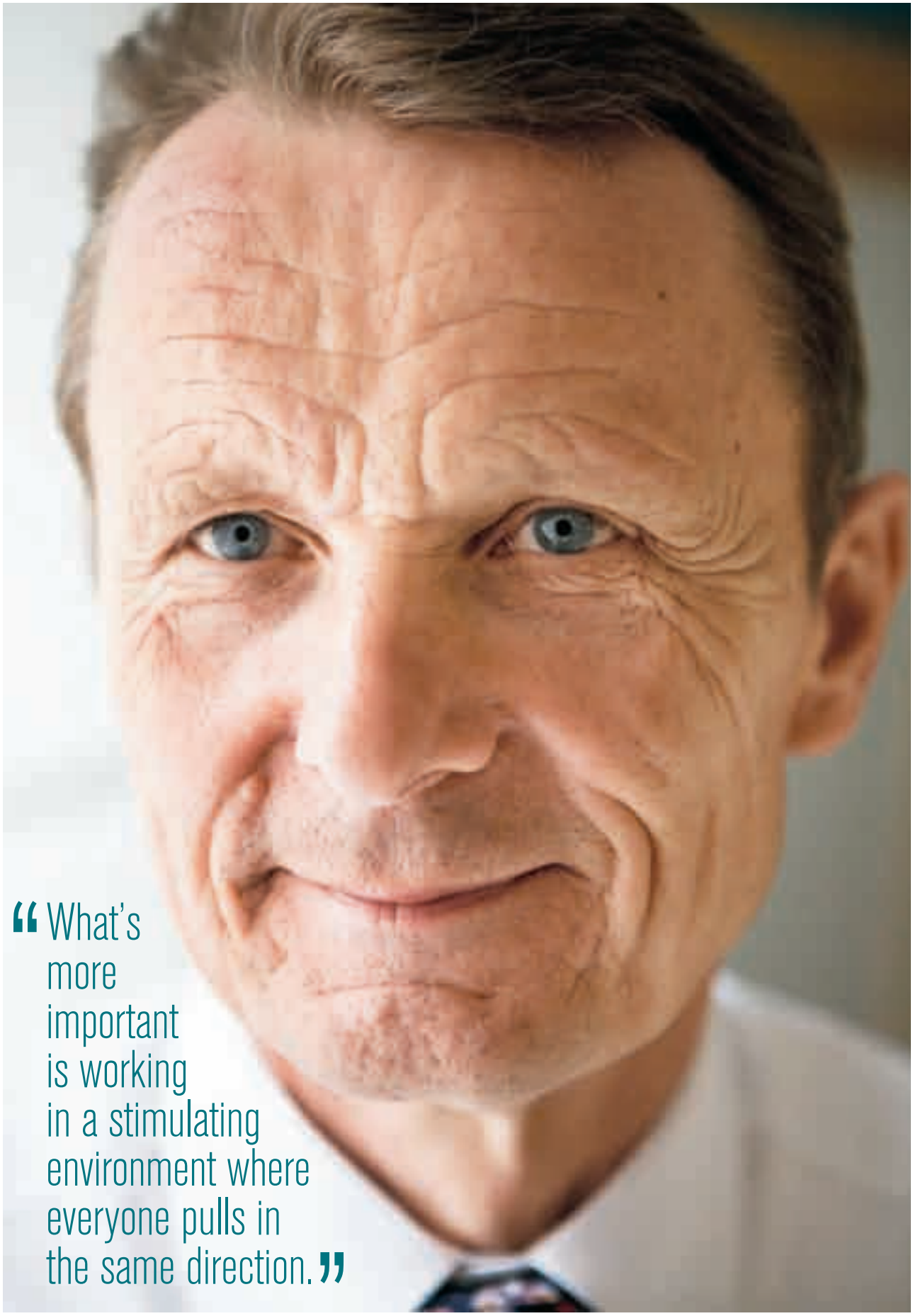
These products are sold by professional building material dealers. They consist of made-to-measure floor-mounted sliding doors with aluminium side profiles, floor tracks and ceiling tracks. Sapa Profiler in Sweden was involved in developing them, and supplies the highly value-added profiles.

"The profiles play a crucial role in the new sliding doors' design. Aluminium offers added stability and a wider range of exciting design options than steel and wood," explains Marcus Grimerö, in charge of sliding doors at Elfa.

Prisma's profiles are made of brushed aluminium in silver, bronze, white and chilli. The veneered profiles are available in birch and oak. The sliding doors are also available with attractive veneers in various designs, foil surfaces, and reflective and coloured glass.

The bottom wheels on Elfa's sliding doors have ball bearings for smooth, silent action.

"The doors' entire weight rests on the floor track, making it easier for our customers to install them in their homes," says Grimerö.


“What’s more important is working in a stimulating environment where everyone pulls in the same direction.”

His first job was as a scrap dealer. Ole Enger still works with metal today – but now it's aluminium. In February, he became Sapa's new President and CEO.

Meet Ole Enger

Ole Enger has been Sapa's Chairman of the Board since 2004. He's been a senior executive in several major companies including Norsk Hydro, Elkem and Orkla. Through his work, he has gained 15 years' experience of the American aluminium company Alcoa, whose profile activities are now being merged with Sapa's. Enger's broad experience is also the main reason why he became Sapa's new President and CEO on 15th February. He's currently dedicating 80% of his time to the merger.

"Merging two companies this big is a huge undertaking," he says. "I'm in the unique position of being very well-acquainted with Orkla, Alcoa and Sapa. I would never have become Sapa's CEO if we hadn't been about to embark on this joint venture," he says.

ENGER GREW UP on a farm in Hokksund outside Oslo, Norway. Even before taking his first job – a summer job as a scrap dealer – he was already experienced in business.

"I was only ten years old when I started taking an interest in business," he says. "Because I lived on a farm, I dealt in everything from animals to strawberries and Christmas trees."

Enger ended up in the aluminium industry by chance. After working as a business developer at Norsk Hydro, he joined Elkem in the early 1990's.

"It was a completely different world. I hardly knew what aluminium was then. I've been working with aluminium ever since. After Orkla acquired Sapa, I specialised in profiles."

Although Enger already knows the industry well, he's always thirsty for more knowledge. He says he needs to learn more about the technical processes in the company's profile activities.

"I'm not an office person. Every day I long to visit our production locations," he says. "I want to understand what's going on when I walk around Sapa's facilities, so I have to learn about the extrusion process. If you want to stimulate and inspire other people, you have to know what's happening. This is also essential for good communication with the organisation's employees.

"It's also about respecting the whole production chain. All parts of production are equally important. Before creating a vision for Sapa, I need to find out what we have to do to become global leaders. Too many people create visions that aren't based on reality."

ALTHOUGH ENGER HAS only recently become CEO, he's already clear about Sapa's direction.

"Sapa Profiles is a global leader today, Heat Transfer has a very strong position and Building System needs to get bigger. The aim is to create a company that is competitive throughout the whole production chain. To succeed at this, we need to introduce the Genesis business system. Then we'll become leaders in all three business areas."

What will Sapa look like five years from now?

"Sapa will be considerably larger than today, with improved productivity and stronger customer focus. Our market shares and profits will have increased, paving the way for expansion in the east. Building System's and Heat Transfer's positions will have improved. If we don't achieve this in five years, we'll have failed."

Enger describes himself as deeply committed to organisational development. He feels it's vital for Sapa to continue applying a decentralised organisational model after the merger with Alcoa.

"In this transaction, we've made it clear right from the start that we want a decentralised organisation. Sapa's model allows the employees in the production chain far more influence than in traditional organisations. This process must continue right out to the operators."

When asked to summarise the most important aspect of a job, Enger's answer is human contact.

"What's more important is working in a stimulating environment where everyone pulls in the same direction. I aim to maintain contact with everyone in the whole organisation. I find that very rewarding."

TEXT CARL HJELM
PHOTO SUSANNE KRONHOLM

Ole Enger in brief

Age: 59.
Home: Apartment in Stockholm.
Family: Wife and three grown-up children.
Favourite reading: Anything about history. "We need more knowledge about our history."
Favourite films: Prefers theatre, opera and concerts to the cinema.
Music: Classical music, preferably at concerts.
Favourite place in the world: China. "The Chinese are generally open to new ideas and knowledge."
Car: Volvo XC90.
Favourite food: Chinese and Japanese food.
What you didn't know about Ole Enger: "As a teenager I performed as an actor at weddings and other occasions. I performed in Ibsen's Peer Gynt."

Aluminium dreams

Bed manufacturer Hästens collaborated with Sapa in developing their top model, in which steel and wood have been replaced with aluminium profiles. **"Aluminium is lightweight and has an elegant, simple look,"** says Emma Sandsjö, Hästens' communications manager.

Swedish bed manufacturer Hästens is a family company founded in 1852 and now run by fifth generation bed specialists. Hästens has been a purveyor to the Royal Court of Sweden since 1952.

In 2005, Hästens decided to develop Citation, the top model in the company's range of adjustable beds. Aluminium was the material they chose.

"We wanted to take the model to a new level. Our aim was to achieve greater functionality, a light base and an attractive design," says Sandsjö.

Most of Hästens' product development takes place in-house. However, because the company had never worked with aluminium before, Hästens contacted Sapa in August 2005.

"Sapa helped with the product development and we tested different solutions," says Sandsjö. "We soon found a base that was suitable for Citation. Our collaboration with Sapa's product developers was highly successful, and our combined know-how produced excellent results."

THE PRODUCT DEVELOPMENT FOR CITATION ended in late 2005. Sapa has manufactured aluminium profiles for 1,800 beds to date. Production includes extrusion, processing and surface treatment.

Citation's base was previously made from a combination of steel and wood. Sandsjö sees several advantages from using aluminium profiles.

"The design aspect is important," she says. "Aluminium is a popular material right now. It has an elegant, simple look that appeals to our customers. Aluminium also makes the beds lighter and easier to use."

Another advantage is that the base consists of several components that are screwed instead of welded together.

The new model was launched in spring 2006, and the new Citation is a hit with Hästens' customers.

"Citation is definitely a popular bed. We expect sales to increase significantly in 2007," says Sandsjö.

TEXT CARL HJELM

Taking transport
to new heights

The Dutch company Apollo manufactures vertical transport systems – a must for transporting anything from tea bags to truck wheels inside factories. The Spiral Conveyor enables customers to save space and improve transport flows between storeys. This model has been further improved and is now made of aluminium profiles.

"Thanks to a successful collaboration with Sapa in the Netherlands, we can manufacture the Spiral Conveyor directly to order, cutting production time by 25 percent. This model also runs more quietly now that it's made of aluminium," says Arnold Duim at Apollo.

Tent poles galore

Tents are a necessity after natural disasters, or during military operations such as the conflicts in the Middle East. J&S Franklin are the leading supplier of tentage to the British Armed Forces, so the company needs a vast supply of aluminium tent poles.

The company bought tent poles worth over SEK 17 million in 2005 alone.

"We have successfully completed a trial order of 5000 poles and have received orders for a further 100,000. We hope to sign a further three year contract during May 2007" says John Ward of Sapa Profiles Limited in the UK.

High technology all the way

The Estonian company Ldiamon manufactures state-of-the-art equipment for dialysis monitoring. Even the seemingly simple support tube in aluminium profile is carefully designed down to the last detail. Despite its diameter of just four centimetres, it needs to contain several cables for the device's LCD screen and rubber tubes for various medicines. What's more, its height needs to be adjustable.

"There's a fairly small market for this type of device, so it's not a huge seller. But it's an interesting example of how these devices are advanced all the way," says Taavi Saksen, sales engineer at Sapa Profiilid in Tallinn.

Aluminium lightens up energy consumption

Energy-intensive to make – but easy to recycle. Today, **95% of all the aluminium** in a car is recycled.

"Aluminium is quite an impractical material in a throw-away society, but perfect in an environmentally conscious one," says Johan Lindström, CEO of the Swedish Aluminium Association.

Approximately 50 million passenger cars are manufactured annually worldwide, and vehicle fleets have become progressively heav-ier in recent years. This is because equipment such as air conditioning, airbags and other safety features are now standard in many vehicles.

"These units weigh quite a lot. What's more, vehicle bodies have generally been reinforced to meet increasingly strict industrial standards," explains Lindström.

Comfort and safety are strong driving factors in vehicle development. Another key factor is the environment. There is a political ambition to reduce dependence on oil, and the limits for carbon dioxide emissions are decreasing in many countries. This will naturally affect engine development, but there are more ways of improving a car's fuel economy. After all, a small, light car consumes less fuel than a large, heavy one.

"A major challenge for today's automotive industry is to reduce vehicle weight while increasing safety and comfort," says Lindström.

THE SOLUTION IS TO utilise new, lighter materials. Plastic, aluminium and magnesium are increasingly being used in various components to reduce vehicles' weight while raising their performance.

"There's still huge untapped potential here. There's a lot of new technology to learn, and many outmoded attitudes persist regarding choice of materials. Design engineers make personal choices," says Lindström.

Nevertheless, many traditional steel and cast iron vehicle parts have been replaced with aluminium over the years, for instance engine blocks, bumpers and the unit behind the bumper that absorbs collision impact. Aluminium is also used in many fittings, such as the tracks used for attaching roof boxes.

"Aluminium is now increasingly replacing steel in body details and metal sheeting. Some car brands have been using aluminium for quite a long time in specific production series, but now it's being used more and more in standard cars," says Lindström.

He points out that aluminium in cars is nothing new. Few people are aware that Land Rover has had an aluminium body since the 1950s. More recently, Audi has been a forerunner by building the entire chassis of the car in aluminium. The Audi A8 was launched as early as 1994. This was followed up in 1999 with the Audi A2, another model made also entirely of aluminium – both the body and the load-bearing structure.

Competing materials for vehicle construction include carbon fibre-reinforced plastic, which is also very strong in relation to its weight.

"The problem is that it can't be recycled and isn't based on a renewable source. But bauxite, the raw material that aluminium is made from, is a virtually infinite resource."

MAKING ALUMINIUM from bauxite is energy-intensive. It takes a lot of electricity to transform aluminium oxide into metallic aluminium through electrolysis. However, most of the aluminium used in cars is so-called secondary aluminium made from recycled cast iron.

"It's the same quality as primary aluminium, and this is one of the material's big benefits. It can be recycled repeatedly without impairing its quality. What's more, the recycling process requires very little energy – just 5%

of the energy required to produce primary aluminium," stresses Lindström.

There's an enormous supply of raw material for recycling. All the aluminium products in everyday use today have a total weight of about 460 million tonnes. Meanwhile, approximately 27 million tonnes of aluminium are produced each year, and use of aluminium is increasing by 5 to 10% every year.

LINDSTRÖM SEES MANY future opportunities for using aluminium to promote environmental sustainability.

"For a start, all products should be made lighter. Take fridges, for instance. Replacing the steel in fridges with aluminium wouldn't make much difference to households. But it would play a crucial role in reducing carbon dioxide emissions from worldwide transport. Reducing a product's weight means using other materials. This applies to white goods, home electronics and other consumer goods."

The construction sector also has much to gain from using aluminium. Here the biggest benefit isn't weight savings but lower maintenance – also an important environmental factor.

"Aluminium can replace steel and wood in frameworks and facades. Among other things, this saves the need for repainting. This is common in the United States. Skyscrapers and other large constructions are usually made of glass and aluminium. Aluminium requires no treatment at all and lasts for hundreds of years. It doesn't even need washing," says Lindström.

As a piece of historic trivia, he mentions the Church of San Gioacchino in Rome, built in the late 19th century. Its roof was made of aluminium instead of copper as a status symbol; aluminium was extremely expensive back then.

"It's still in great condition today and needs no renovation," he says.

TEXT SUSANNA LIDSTRÖM
ILLUSTRATION HELENA LUNDING

Profile production is the basic activity in Trzcianka, but the future lies in increased component manufacture with increasingly value-added products.

FORGING AHEAD IN POLAND

Sapa Aluminium's Polish CEO keeps his promises. The company's business has doubled in five years. Peter Arendt hopes that new **investment in tailored solutions** will help make the next five years equally successful.

Sapa in Poland has a strong position on the domestic market and is a leader in many areas, of which the construction industry is by far the largest. But competition has increased. Everyone wants a share in Poland's construction boom and the new infrastructure investments initiated since Poland's accession to the EU.

"Poland's sharp economic growth has led to a boom in construction. New airports, office complexes and hotels are growing up everywhere. That's where we come in – we have the know-how and resources and are well-known as a reliable, solid business partner," says CEO Peter Arendt.

Five years ago, he predicted that the company would double in size by today, and this vision has been achieved. Sales have risen from SEK 325 million in 2002 to over SEK 750 million in 2006. Peter's vision also included achieving an export rate of half the company's Polish production.

"We're not quite there yet, but the export rate is already more than 25% based on volume. Due to our increased proportion of machined profiles with higher added value, this figure is slightly higher when calculated on the basis of net sales."

Germany is the company's biggest export market, and demand for components has increased sharply there in recent years. Exports have also increased to the Czech Republic and Slovenia, and initiatives are also being taken further east.

"We've started establishing contacts in Ukraine and Belarus. We expect business to take off there in the longer term," he says.

PHOTO: PIOTR MALECKI/SPECTRUM PICTURES.

The Polish building boom is creating many new offices and hotels.

IT ALL STARTED IN north-east Poland, in Trzcianka, a town with a population of 20,000. Sapa Poland established its first press here in 1993. Since then Sapa, with just over 700 employees, has become Trzcianka's largest employer. The company's sales manager, Marzena Wiśniewska, was there at the start.

"When Sapa was established in Poland 14 years ago, there was nothing here. We didn't even have any presses for our production when my sales reps starting contacting customers. We had to patiently explain what aluminium


Peter Arendt


Piotr Wieliński

> “We aim to supply as many complete products as possible, and we’re getting more and more of this type of order”

profiles are and what they can be used for. Things are different today. Now our customers know what they want and what demands they can make. The market’s knowledge has increased – just like ours has,” says Wiśniewska.

The press that was installed in 1993 is still in use, but continuous investments have been made since then. Last year’s installation of a third press for wider profiles and harder alloys has doubled the company’s capacity in Trzcianka.

“Almost 90 percent of our produced goods are customised, and many of our 6,500 specially manufactured tools are made in Trzcianka,” says production manager Piotr Wieliński during a tour of the factory.

ROUGHLY 40 PERCENT of the manufactured products are anodised. There are already two anodising plants in Trzcianka: a new one installed in 2006 and an older one in use since 1994. During the autumn, the older plant will be replaced with a new, larger, more efficient plant next to the recently opened modern treatment plant. Environmental issues are of top concern, and all aspects of the new plant will comply with strict standards.

Various types of fabrication, including welding and assembly, take place in rooms next to the presses and in a building on the other side of Trzcianka. “Wheelchair components for Etac in Germany,” says Piotr Wieliński pointing to freshly welded aluminium frames. A little further away are roof rack components for the Swedish company Thule, shower panels for Rocca in Spain and parts of solar panels, which could become a new, growing market. However, Wieliński is most enthusiastic about a stack of boxes ready-packed with goods. They contain complete kits for the telecom company Ericsson’s products.

“This is where the future lies. We aim to supply as many complete products as possible, and we’re getting more and more of this type of order,” says Wieliński.

He calls it a one-stop shop concept. Sapa produces aluminium parts and supplements them with purchased components, all adapted to the customer’s production needs. In some cases, the company supplies finished products packed and ready according to specification.

WHILE PROFILE PRODUCTION and anodisation will remain the basis of the company’s production, the real growth potential lies in components – a view shared by Peter Arendt.

The next step is to develop component production in Łódź, where Sapa currently has a powered coating plant. A new company, Sapa Komponenty, will primarily produce components for the automotive industry. The decision to establish production in Łódź rather than Trzcianka is due partly to Łódź’s accessible location in central Poland, and partly to the university and colleges in and around Łódź, which will provide an excellent recruitment base.

“We’re already Poland’s biggest component manufacturer. Now we want to supply as many value-added and ready-packed products as possible and offer customers everything from production solutions and product design to final assembly and distribution. In Poland, we’re just starting out and have a long way to go. But we see this as an exciting challenge,” says Arendt.

TEXT: SUSANNA LINDGREN
PHOTOS: JAN BRYKCZYNSK

Sapa delivers Italian designs

When the Slovenian household appliance company Gorenje had finished designing the aluminium panels for its new exclusive Pininfarina line of kitchen products, it started looking for a manufacturer to produce them. However, few could meet the challenge. The first attempts were made by manufacturers in Italy, the native country of Italian designer Paolo Pininfarina. But in the end, it was Sapa in Sweden that succeeded in producing the goods.

"None of the first manufacturers we asked could meet our requirements for quality and durability. The design is unusual because the door panels and handles are made in a single piece," explains Irena Pečnik, executive assistant at Gorenje's purchasing and logistics department in Velenje, Slovenia.

Gorenje's collaboration with Sapa started in the office but continued in the factory. Representatives from Gorenje, including Pečnik, attended the first trial pressings in Finspång, Sweden.

"The panel has a very unusual shape. The biggest challenge was the c-shaped handle," says Pečnik.

Sapa also proposed some changes that resulted in a thinner, lighter panel, which in turn reduced the load on the doors' hinges.

"Part of production is still located in Sweden, but thanks to our new, larger press in Trzcianka, we'll soon be able to move all production there," says Franc Abram, export manager at Sapa in Poland, who initiated the collaboration with Gorenje.

SIMON LAMARRE

He describes himself as a cross between an artist and an engineer – and he loves both of these roles. Canadian Simon Lamarre is the designer behind the new Volvo C30. This car is expected to be a big seller among urban singles and couples with an active outdoor life.

Simon Lamarre, studio chief designer at Volvo Cars in Göteborg, says it straight away to avoid misunderstandings: designing and developing a new car model is no one-man job.

"It's definitely a team effort. Anyone who claims otherwise is lying."

It took several years to design the C30, and over 40 people were sometimes involved in the process. And that's not counting the production staff, marketing staff etc.

Of course, only a few key individuals had the key roles.

"Naturally, as a designer I had to take a leading role and make sure the ideas were put into practice," says Lamarre.

Lamarre explains that he has a creative role throughout the whole process, although mainly in the beginning – until the model and theme have been decided on. This is followed by an intensive phase where the designer collaborates with the engineers to choose all the system solutions and ensure that they work.

On the road to achieving a finished car there are several stops when both the car's design and technical function are meticulously analysed. The longer the process takes, the less creative and artistic freedom there is. The process passes from a preliminary design with ample freedom, via a stage where the parts and features can be changed or moved a maximum of 5 mm, to the next stage where they can only be moved half a millimetre. Finally, all parts of the technical design are completely locked. In car speak, this is known as a "frozen product".

"Deviations are always a point of discussion and a matter of give and take between the designer and design engineers. And things are never the same for two models. It's an organic process."

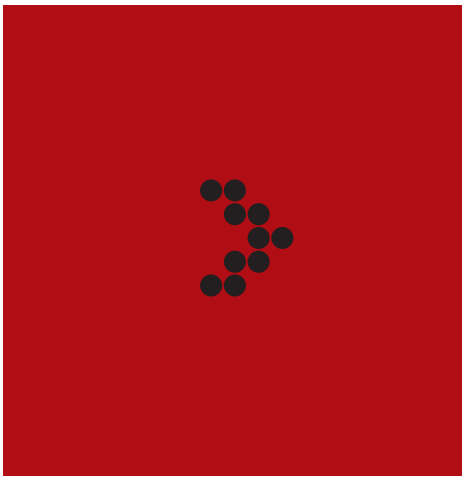
DURING THE PROJECT, Lamarre's job becomes progressively less artistic and increasingly focused on solving technical problems. But good design is always part of the process.

"I sometimes jokingly say that my job consists of 10 percent design and 90 percent nagging. My job is really about selling the design concept to everyone else involved," he says.

Simon Lamarre in brief

Age: 38.
Training: Product design at UQAM, Université de Québec à Montréal.
Background: Moved to Sweden in 1990 and joined Saab as a clay modeller in 1992. Three years later, he joined Volvo and got them to switch from clay modelling to computer modelling. Worked on the interior design of the Volvo XC90. Has worked on the C30's interior design since 2002.
Cars: Volvo V70 (he's a father of three), but the C30 is on his wish list.
Favourite car: Austin Healey and Volvo C30.

“I sometimes jokingly say that my job consists of 10 percent design and 90 percent nagging,” says studio chief designer Simon Lamarre.



All this hard work is rewarded when the finished model is finally ready. Then the project team gets the new lease of energy required to tackle the next project.

"It's an enormous kick to see a finished product roll out for the first time. It's almost unreal," says Lamarre with a huge grin.

But getting back to the drawing board and the computer – where do the inspiration and ideas come from during the creative process?

"People often ask me that, and I still don't know what to answer. It's about creating a feeling, and that can come from anywhere. It can be evoked by a gadget in a shop. Or by going away from your everyday environment and doing something different. Or by visiting a fair."

Many of the ideas for the C30 came from sport and fashion. What do the target group do in their free time? How do they dress? What do they expect from a car? The project team asked themselves these three questions. The answers that emerged had a lot to do with boards and board sports. Many of the target consumers are skateboarders, snowboarders and wakeboarders, and dress in the style associated with these sports.

The result was a sporty car that was small by Volvo standards, primarily designed to hold one or two people and their luggage or leisure equipment.

FROM A TECHNICAL AND DESIGN perspective, both new and old solutions were used to attract the new target group. The team wanted the car to look cool and showy, but to still have details that clearly show it's a Volvo. One of its cool, sporty elements is the brushed aluminium centre console. The console's surface can be varied. For instance, it can be decorated with a surf motif that looks like a wave has washed over it.

"Aluminium's appearance can be varied a lot through brushing, etching, lacquering or printing" says Lamarre, who feels that aluminium could be used much more in cars than it is today.

As a designer, he likes to use aluminium for its aesthetic value, but of course the environmental aspect is important too. Aluminium is used in the C30's wheels, bonnet and other parts to reduce the car's weight and thus cut fuel consumption.

"Environmental regulations will mean a lot of changes for car manufacturers, and aluminium meets many of the new criteria. But the design engineers have more influence than we do over this aspect, for instance when they choose the material for a seat frame."

ANOTHER ENVIRONMENTAL BENEFIT of aluminium is its recyclability. The obvious drawback is its price.

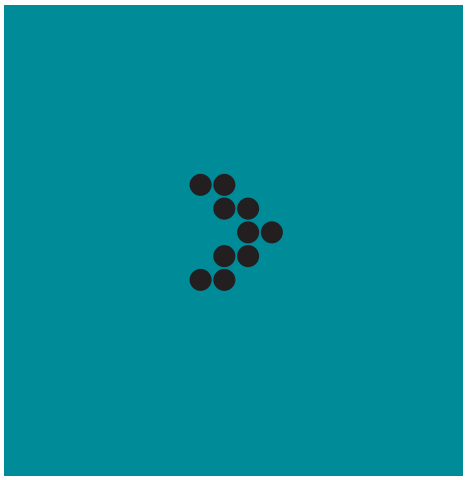
"Some manufacturers make whole cars in aluminium, but that's very expensive. You need to constantly ask yourself what customers are prepared to pay. It's a balancing act."

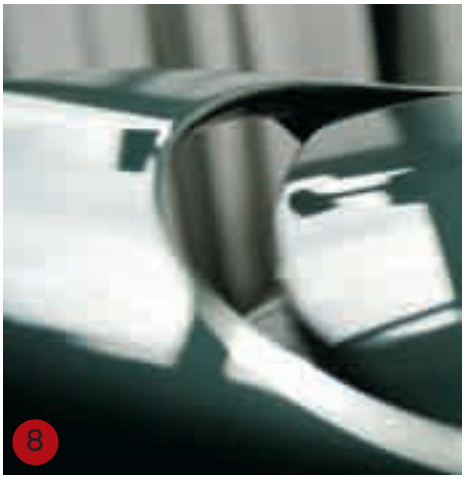
When asked what he thinks cars will be like

Small part with a vital function

Sapa manufactures a support component for the Volvo C30's B-pillar (the pillar behind the door). This aluminium profile is a safety-related part that helps the B-pillar deform as intended by the car's designers in the event of collision.

The profile's unique properties have been utilised by adding an additional function in the cross-section: a hook that partially supports the seats. This function wouldn't have been possible if the part had been made of a different material.





in the future, Lamarre predicts a mixture of old and new, just like with the C30.

"In some ways they won't differ all that much from today's cars. Basic functions like four wheels and a steering wheel will remain the same, but new materials and techniques will affect both performance and environmental impact," he says. He also sees cars becoming more adaptable to owners' requirements, which may change during a car's lifespan. Buyers will also be able to use their car to express their personality and image through their choice of adaptations and add-ons.

But Volvo Cars is still concentrating on the C30. The company aims to sell 65,000 cars a year. The C30 has already been launched throughout Europe, with Japan and the USA soon to follow. Lamarre says that working on the C30 has taught him a good deal about both internal and external marketing. And he's optimistic:

"I'm fairly confident that I could sell a C30 to just about everyone on the planet," he says.

TEXT THOMAS ÖSTBERG
PHOTOS STEFAN IDEBERG

1, 2 The aluminium centre console makes it possible to vary and personalise the surface, for instance through brushing, lacquering or etching.

3. According to Lamarre, the rear lights are the Volvo C30's real pièce de résistance. All the expressive shapes come together in the broad shoulder line typical of a modern Volvo. What looks like chrome inside the rear lights is actually an aluminised plastic surface.

4. Aluminium details in and around the gear lever give the car a sporty look.

5. The sporty look is enhanced by brushed aluminium door handles inside the car.

6. The designers chose aluminium for the steering wheel to save weight.

7. Volvo and many other car manufacturers have long used aluminium in wheels to reduce the car's total weight.

8. The C30's spoiler is a highly functional detail that improves aerodynamics and stability at high speed.

GOOD NEWS FOR CARGO

Volvo Cars and Sapa spent over three years brainstorming ideas and technical solutions. The result: **an aluminium cargo rail** with unique functions.

The development work has been going on since 2004. The new cargo rail (known to insiders simply as "the rail") is part of Volvo's efforts to make its cars safer. But it's also a result of new regulations under DIN (Deutsche Industrienorm), which require all car manufacturers to equip their vehicles with fastening points capable of securing a minimum amount of cargo.

The solution developed by Volvo, with Sapa as an active development partner, replaces the steel rings on previous models of the V70 and XC70. What makes the solution unique is that the four hooks in the floor rails can be moved anywhere along the rails, and they can be folded flush with the floor when not in use to avoid damaging cargo as it is pushed in along the floor.

"It was a real challenge to design hooks that were free enough to move, but didn't move when they weren't supposed to. They also had to be locked in the raised position," says Håkan Muhr, key account manager at Sapa Automotive. The aluminium rail also eliminates the need for brackets, since the entire floor of the cargo space rests on a flange protruding from the rail. What's more, the side panels are inserted into another flange on the cargo rail, making use of the aluminium profile's capacity for integrating various functions in the profile's cross-section."

THE SYSTEM ALSO INCLUDES fastening hooks in the panels under the side windows.

"This allows the option of securing the load three-dimensionally, something that no other car manufacturer can offer," says Carin Stenmark, project manager at Volvo Cars.

The new models of the V70 and XC70 will hit the market this autumn, and Sapa will supply 200,000 cargo rails annually, consisting of extruded profiles and mounted accessories.

"Volvo has classified the cargo securing system as a unique sales factor. This means that the system offers customers added value and thus helps sell the car," says Stenmark.

SHE REPORTS THAT the collaboration between the companies worked well, and that they found ways of working both faster and more efficiently during the course of the project.

"Volvo is in charge of the design, but we solved both big and small problems together," she says. "Sapa contributed invaluable expertise and know-how."

Volvo will also be offering accessories such as mesh dividers and sliding cargo floors for the new cargo securing system.

TEXT THOMAS ÖSTBERG

Design prize for park bench

The fourth Aluminium Design prize was awarded in October 2006. The prize is organised by the Swedish trade organisation The Swedish Aluminium Association. Of the 52 entries, the one that appealed most to the competition panel was Bladvila, a park bench. The bench is designed by Joanna Eriksson and made from a single aluminium sheet. The first prototype is currently in production. (This was the first prize in the competition.) Eriksson is a freelance designer who creates glass products as well as furniture for public areas.

"I wanted to design a sculptural bench for public parks that also serves a decorative purpose. Using aluminium made the bench much lighter, and – just as importantly – aluminium doesn't rust," she explains.

What the panel said:
"Poetry in aluminium – that's a fitting description for Bladvila when it casts its leafy shadows. This bench also provides a place to sit and rest for a while. Bladvila has a traditional sofa shape that harmonises beautifully with nature. Its design language is bold and unconventional, but also friendly and inviting."

Light stand for light monitors

Flat monitors have conquered homes. Sapa Profiles in Sweden has designed an adjustable arm in anodised aluminium for mounting flat TV screens and monitors to the wall, table or ceiling.

The product is part of the Linjé concept that is made by Götessons. Linjé is available in endless possible combinations for both offices and homes. Götessons has sales throughout Scandinavia and in some parts of Europe.

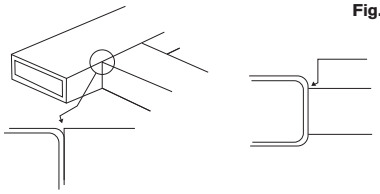
The profile school

Lars-Göran Borg, at Teknisk Service, Sapa Profiler offers tips on dimensions and tolerances for better visual design.

When profiles meet at right angles, or when end covers need to be joined, it's important to design the joints in a way that looks attractive.

A simple example is when two rectangular tubes meet at right angles. Because the profiles always have a corner radius, a groove is formed and any misalignment will be clearly visible.

Fig.1



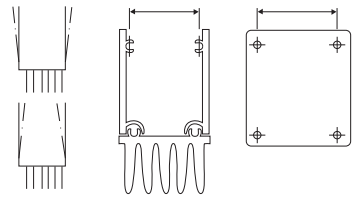
The solution is to extend the corner **(see fig. 1)**. A short straight section between the corner and the connecting profile hides any misalignment. Often there is no need for special tolerances, which has economic benefits.

Because of tolerances on end covers and, primarily, on the profile, the outer contours seldom coincide exactly. This problem is also solved by making the end cover slightly larger **(see fig. 2)**.

Fig.2

It's hard to put an end panel on large U-shaped profiles, since the gap size has a relatively high tolerance. One solution is to divide the U-shaped profile into several smaller sections with built-in joints so that the holes in the end panel guide and lock the profiles to the exact dimension **(see fig. 3)**.

Fig.3



STAIRWAY TO HEAVEN

Wibes has been making ladders for over 75 years, and is one of Europe's leading manufacturers. The company's factory in Nässjö, Sweden produces 2,000 tonnes of aluminium ladders every year. All the ladders are carefully tested to meet the European EN 131 standard as well as the stricter Swedish SS 2091 standard. All Wibes ladders have a label specifying the ladder's permitted load, length and weight.

The tests are necessary – when the Swedish Labour Inspectorate inspected roughly 2,000 workplaces, one in four ladders failed to pass muster and had to be replaced.

Summer safety

Rainy and cold – that's what a typical Scandinavian summer is like. That's why the type of glazed patio extensions manufactured by Novoroom are becoming increasingly popular. To withstand wear from weather and use, all the patio frames are made of anodised aluminium profiles.

SUMMER GOODS
IN ALUMINIUM

Welcome shade

With awnings on your house, you can decide when to shut out the sunshine. With sales in over 100 countries, Turnils is the global leader in window covering systems. To withstand the elements anywhere on the globe, parts such as drop arms, roof rails and guide rails are made of aluminium.

STAY COOL IN THE POOL

More and more pool owners are discovering the benefits of a pool cover: no rubbish and debris in the pool, lower heating costs and less need for chemicals in the water.

Perhaps the biggest benefit of all is the safety aspect. In many countries, pool owners are required by law to comply with safety regulations. Putting a fence round the pool is one solution, but the Swedish company Pool-Guard has designed a much better solution that is also safer for children: a canopy with aluminium edge profiles that can be rolled up.

Thanks to the anodised profiles, Pool-Guard has a useful life of at least 20 years. That gives you time for plenty of cool dips!

The Hawaii Superferry, built by Austal, is a 107 metre long catamaran that holds roughly 860 passengers and 280 cars. The high-speed ferry travels around Hawaii.

Superferry challenge for shipbuilder

When Austal opened a new shipyard in Mobile, Alabama in the United States, they already had long experience of building aluminium commercial and military vessels. The big challenge was finding **aluminium profiles that made the grade.**

Austal was founded in Australia in 1988 with the vision of building top-quality commercial vessels for the global market. After five years, the company was a leading manufacturer of 40-metre passenger catamarans. Today, Austal is the world's largest manufacturer of high-speed ferries, and has added military vessels to its product range. In 2000, Austal opened a new shipyard in the American town of Mobile, Alabama and won the order for the Hawaii Superferry – the biggest high-speed ferry ever built in the USA.

The company was also contracted to build the Littoral Combat Ship (LCS) for the US Navy in collaboration with General Dynamics. Weight is a key factor when building high-speed vessels, so aluminium is a fairly natural choice of material. But finding the right type of aluminium in the USA for ships of this size proved a bigger challenge than Austal had anticipated. Chief architect Frank Ryan explains:

"No one else in the US had ever build this type of vessel before, and no other company had ever used extruded aluminium to this extent. The aluminium delivered to us was deformed and beneath all criticism, which caused us big problems."

It was at this stage that sales manager Tolga Egrilmezer at Sapa Mass Transportation in the UK contacted Austal.

"Sapa had heard that we made large aluminium ships in the US and offered to supply us with extruded aluminium profiles," says Chris Moyle, head of aluminium components at Austal. "Up till then, we'd only focused on

> “We can get solutions adapted to our specific needs.”

The Littoral Combat Ship is designed as a trimaran to withstand rough weather.

the actual raw material, which was hard to find in the US. We gave Sapa a chance, and they kept their promise.”

SAPA’S FIRST DELIVERY OF aluminium profiles was for the Hawaii Superferry. The next project, the first LCS ship, had longer lead times, so Austal had a chance to study Sapa’s product portfolio in greater detail. The company chose to introduce friction stir welding (FSW), a technique that gave Austal many benefits.

“Working with individual MIG-welded aluminium profiles requires very high expertise,” explains Moyle. “In 2004 we had 120 employees at our Mobile plant, and skilled workers were in extremely short supply. Using FSW gave us huge potential for saving on manpower.

“Sapa’s 2.2 metre wide FSW panels allowed us to cut our production resources considerably. As ship builders, we measure our efficiency by the number of working hours per tonne it takes to build a vessel.”

Besides huge savings in working hours, Austal is also saving on consumable materials such as gas and welding wire. By using FSW, the company has also solved the problem of finding skilled labour.

Austal is currently building the second Hawaii Superferry, and plans to start work on its second ICS ship in mid-2007. This means that manpower savings will be even more important to the company’s future success.

Although FSW has provided practical solutions to Austal’s ship production problems, Sapa Mass Transportation played an equally important role in the work. Tolga Egrilmezer explains:

“Our philosophy is to develop a relationship with each individual customer by understanding their needs and finding value-added solutions. We aim to be a gateway to the Sapa Group’s global resources.”

THE OFFER TO AUSTAL entailed supplying aluminium profiles and FSW panels from Europe and aluminium profiles from Sapa Profiles Inc. in Portland, USA.

Today, Sapa also supplies project management, R&D and logistics resources. According to Egrilmezer, the collaboration really took off when a group of employees from Austal in the USA and Australia visited Sweden to take a closer look at what Sapa had to offer. Both Frank Ryan and Chris Moyle agree with this, referring to the collaboration as “much more than a business deal”.

“We always get a quick response from Sapa’s employees. Sapa’s technical expertise means that we can get solutions adapted to our specific needs. They haven’t just helped us to save on manpower – we’ve also saved time and money on development,” says Moyle.

TEXT LINDA TROTMAN
PHOTO AUSTAL USA

Mass Transportation in brief

- A gateway to the Sapa Group’s global resources for customers in the rail and shipping industries. Sapa Mass Transportation applies the one-stop shop concept, where a specialist team takes care of the whole process – from design to production of extruded aluminium profiles and FSW panels.
- Offers delivery of profiles from the press facility that is most convenient for the customer. Austal USA get aluminium profiles from Sapa Profiles Inc in Portland, USA, FSW panels from Sweden and large aluminium profiles from Sapa RC Profiles in Belgium.

New model for screw ports

Screw ports are commonly used for joining aluminium profiles. Now a new template for screw ports means that Sapa's customers can easily test which type of screw and fixing method suits their individual product the best.

"The template gives you a feel for which screw to use when you develop a product. It's completely different to just studying a drawing and reading a table," says Anders Helander at Teknisk Service, Sapa in Sweden.

The new template allows screws to be inserted in both longitudinal and transverse directions. It can be used for everything from fastening end coverings on rectangular profiles to screwing light fittings into place.

Supporting solar power

Solar energy is both renewable and environmentally friendly – and many experts are convinced it's the energy source of the future.

The problem is that enormous solar panels are needed to provide useful amounts of energy. Conergy, a German solar cell panel manufacturer, has taken stock of this.

Conergy contacted Sapa when the company planned to design a new support structure for its solar cell panels. The supports rotate on two axes so they can follow the sun's movement throughout the day. As a result, they produce 35% more electricity than fixed solar panels.

"Our collaboration started in July. I think I'd misunderstood how big these solar cell panels were – it turned out they were 16 by 6 metres," laughs João Almeida, sales director at Sapa in Portugal.

Sapa was able to supply Conergy with ready-to-use supports just one month after the collaboration started.

"We hope that collaborating with a market leader like Conergy will raise our profile in the industry in general," says Almeida.

Mighty solar power

Imagine a square measuring 500 by 500 kilometres covered with solar panels in the Sahara, the world's largest desert. An area of solar panels measuring 250,000 square kilometres (less than 3% of the Sahara's total area) would produce energy equivalent to the entire world's energy consumption from electricity, oil and nuclear power. It's a dizzying thought. A solar power plant this large will probably never exist, but it says a lot about the power of sunlight.

Surface treatment in brief

The characteristics of aluminium profiles are largely determined by their surface; the type of coating, structure and shine create different effects. A wide variety of available surface treatment methods give us plenty of options.

An object's surface structure plays an important role in its appearance. This naturally also applies to aluminium profiles. Mechanical surface treatment such as grinding, brushing or polishing creates a structure that makes the surface appear more dynamic and interesting. The various types of surface treatment available give designers plenty of scope for variety without affecting the profile's technical function. A transparent surface layer means that anodising can be combined with various types of mechanical surface treatment:

- Band grinding creates fine lines on the surface in the grinding direction. The coarseness of these lines depends on the chosen grain size. Grinding with brushes results in a silky, matte surface.
- Polishing creates a smooth, shiny surface. High-shine polishing produces a glossy surface.
- Tumbling is used for small objects. High-shine tumbling results in a smooth, shiny surface and deburring removes burrs and smoothes sharp corners.

Mechanical surface treatment takes place before plain or coloured anodising. Anodising can be done in a wide variety of colours. Depth and shine make the profile's surface look more appealing and emphasise its structure and shape while maintaining the metallic feel. The anodised layer is also extremely hardwearing. Anodisation is primarily used for products and parts where the surface finish is an important factor, for instance interior details and furniture.

Loudspeaker housings.

THE ROYAL SWEDISH OPERA

High-flying technology at the opera

Gold, crimson velvet and crystal chandeliers greet visitors to the Royal Swedish Opera House in Stockholm. Things look different backstage – and **aluminium rails suspended 25 metres in the air** ensure that the performance runs smoothly.

Mechanical lifting devices and computer technology reign supreme behind, above and below the stage at the Royal Opera House. Suspended high up underneath the ceiling are some seventy fly-bars, which are hoisted up and down. Fly-bars are the theatre term for the rails that backdrops, spotlights and other set equipment are fastened to.

"The Royal Swedish Opera House is much more high-tech than many people realise. It has cutting edge stage technology, and has had since it was first established," says Jan Holmgren, stage mechanic at the Royal Swedish Opera.

It used to be necessary to suspend a wood and metal guide device beneath the steel piping fly-bar, but this system was slow and had limited weight-bearing capacity.

TOGETHER WITH a colleague, Holmgren started looking at a combined fly-bar and guide made from an aluminium profile. They found that the types used in Scandinavian opera houses had practical shortcomings, and decided to design their own fly-bar guide. A wooden prototype was produced at their own carpentry workshop, and Sapa was engaged to take part in the development work. Some twenty 18 metre long fly-bar guides are in use today, and the aim is for 50 or 75 fly-bars to be made of aluminium within the next few years. The Royal Opera House's own fly-bar guide has attracted interest in the industry, and may be adopted in other opera houses in the future.

Cross-section of the fly-bar guide.

"The biggest advantage of our fly-bar guide is that several functions are integrated into the profile, which was impossible with a steel fly-bar. It also weighs less, so can carry significantly heavier loads," says Holmgren.

TEXT DAG ENANDER