

WORLD FOOTWEAR

SEPTEMBER/OCTOBER 2013 • VOLUME 27 No.5

THE MAGAZINE FOR THE GLOBAL SHOE INDUSTRY

Sendra still strong after 100 years
Fish leather, the alternative exotic
Solvent-free adhesives for all
US-made components count





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Shoes from the new autumn-winter collection of high-end Spanish footwear brand Magrit.
Image: GDS/Constanze Tillmann

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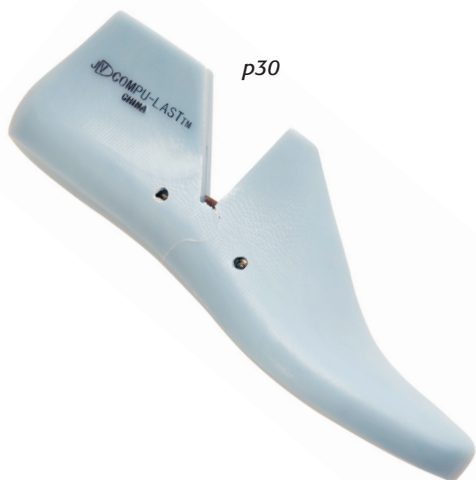
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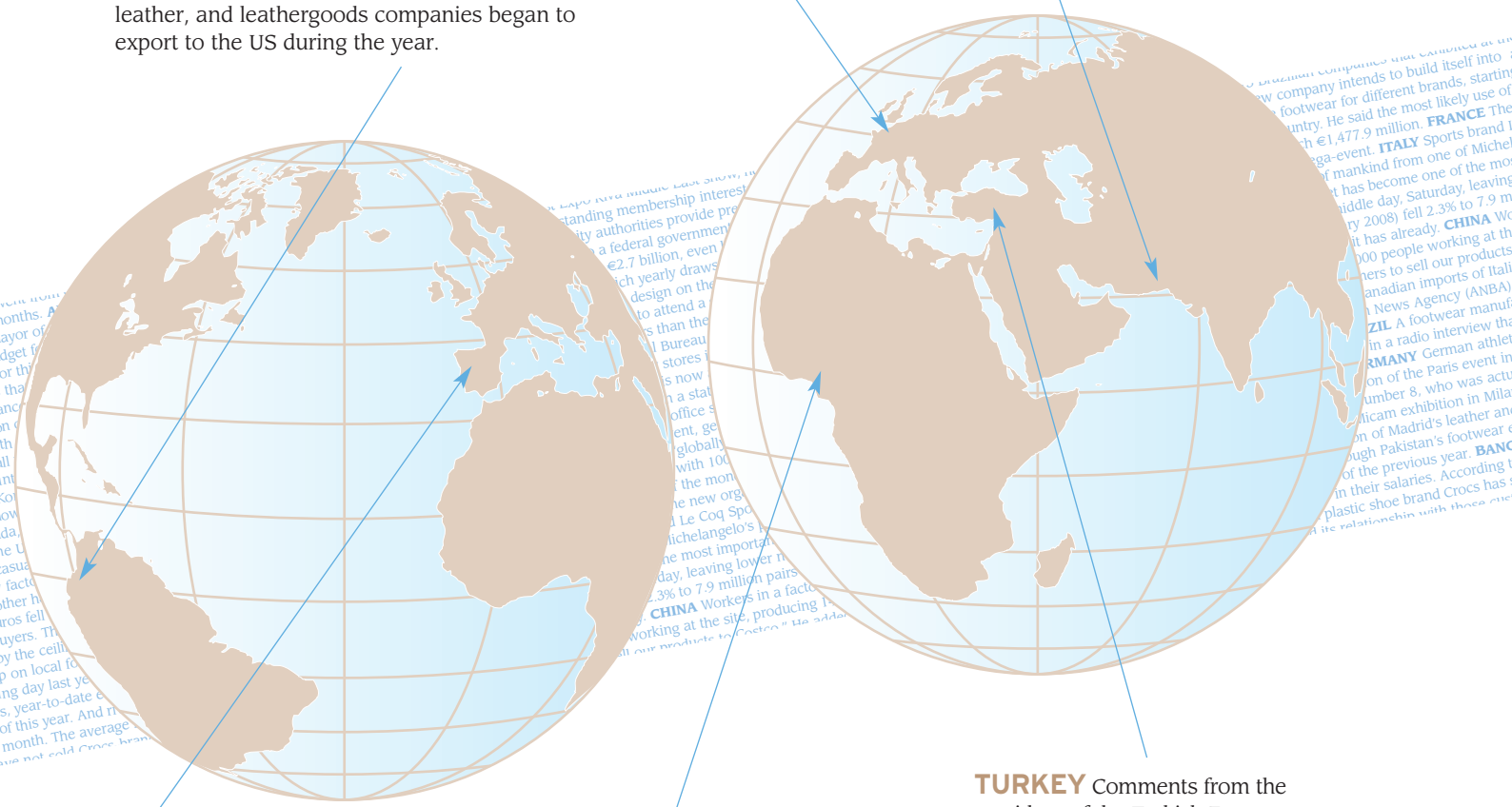


News

FRANCE Stella International is planning to expand its own brands in Paris, turning into a lower priced competitor to luxury clients there. The Taiwan-based shoemaker makes products for Prada and Givenchy among others and has 400 stores in China. Its first European store in Paris specialises in women's shoes priced between €250 and €600, about a third of the cost of a pair of Prada pumps. After years of manufacturing for luxury brands, it wants to leverage the experience to design and produce shoes under its own brands.

COLOMBIA Exports of footwear, leather and leather products from Colombia to the US increased 9.2% between May 2012 and May 2013, according to the Colombian Ministry of Trade, Industry and Tourism. The increase was attributed to the free trade agreement between the countries, signed in May 2012, which meant 32 footwear, leather, and leathergoods companies began to export to the US during the year.

PAKISTAN Global footwear companies sourced almost 12.9 million pairs from Pakistan over the 12-month period from July 2012 to June 2013, an increase of 4.3% on the previous financial year. The value of shoe exports was \$103 million, an increase of 4.5%.



SPAIN Three footwear firms from the province of Alicante have become the first in the Spanish footwear industry to earn certification under a new sustainable production programme. FILIN (Foundation for Local Innovation Initiatives) has developed a sustainable production certification programme for all manufactured goods, with the emphasis on local production. They are PieSanto and Dansi from Elche, and Igor from Almoradi.

NIGERIA Organisers of a Nigerian footwear fair are hoping it will spur growth and "reawaken the footwear manufacturing industry in Nigeria". "A major benefit will be that Nigerians will return to the days of buying made-in-Nigeria school shoes like Bata and Cortina," they said. More than 100,000 visitors were expected at the first Nigerian Leather, Footwear and Accessories Fair, held in Lagos in August.

TURKEY Comments from the president of the Turkish Footwear Industry Association, Huseyin Cetin, suggest the organisation will petition the government to take protectionist measures against cheap non-leather footwear imports. Mr Cetin said that, while Turkish footwear manufacturers earned \$552 million in export revenues in 2012, distributors and retailers imported footwear with a value of \$863 million. He complained that most of the shoes are low-end, low-price sports shoes, which are harming the industry because footwear manufacturers in Turkey are having to reduce their production levels.

UNITED STATES Trade envoy Michael Froman visited a New Balance factory where workers were forthright in their calls for him to resist pressure to make it cheaper to import footwear from low-cost countries in Asia. Employees fear their jobs will be under threat if the proposed Trans-Pacific Partnership trade deal removes import tariffs. Mr Froman made no promise to protect jobs, but said the visit had been helpful.

● Nike has launched two running styles which fit the company's recently discussed strategy of "engineering labour out of the product". The Nike Free Flyknit and Nike Free Hyperfeel use a seamless construction in the upper which significantly reduces the number of shoe components: A typical Air Pegasus shoe is made up of 57 components while the Hyperfeel has just seven. Boosting the number of ranges that use the knitted upper technique is part of Nike's cost-cutting strategy to reduce the reliance of labour and cut costs, as discussed during a recent investors' call.

CHILE Outdoor footwear and apparel brand Jack Wolfskin has partnered Heightsport to accelerate its growth into Colombia, Bolivia, Ecuador, Peru and Chile. Department store concessions and mono brand stores are being planned alongside sales in Heightsport chain stores. The first South American store opened in July in Pucón, Chile. "The growing tourism industry in Chile provides the ideal starting point to bring our products to the South American market," said Michael Rupp, Jack Wolfskin's CEO.

INDIA Footwear group Bata has said it plans to open 100 stores per year, after launching 189 in 2012. Its CEO, Thomas George, said: "China and India are our largest markets. Indonesia is starting to show some tremendous amount of growth of 20% year-on-year." Bata has 1,250 stores across India and is planning more specialised stores for its licensed brands such as Hush Puppies.

CHINA The China Leather Industry Association has said it expects growth of 13% in the value of the country's footwear and leather output in 2013 compared to last year. It said the industry could expect "low-speed but stable" development in the coming years and that, as reform is under way, especially among larger producers, there will be strong growth for producers of machinery, chemicals and other technology.

BANGLADESH Reports from Bangladesh on July 29 said one worker died and at least seven others were injured when an explosion occurred at a footwear factory in Dhaka. Local media quoted workers at the factory as saying the explosion occurred when soling materials caught fire, and named the company as Sikdar Plastics.

ECUADOR Ecuador has 4,500 footwear manufacturers which are providing jobs for 100,000 people, according to Cristina Santana from the national footwear association. "The footwear sector went through a severe crisis between 2005 and 2008," she said. "By the end of 2008, there were barely 600 producers left. Now, we're proud to say, Ecuador has 4,500 shoe manufacturers." The country's 15 million inhabitants are consuming a per capita average of 2.5 pairs of shoes a year, with local manufacturers supplying 80%.

Footprints

CHANCE ENCOUNTER LEADS TO ICEBUG HIRE

Swedish outdoor footwear brand Icebug has appointed a new North American director of sales and marketing with Colorado-based custom ski boot fitting specialist Evan Wert taking up the role.

Mr Wert's involvement with the company came about as a result of a chance meeting at the Outdoor Retailer Winter Market exhibition in 2012. He met an old friend, Gary Richter, outside the exhibition and as they walked together, he noticed that his companion, now North American training and events manager for Icebug, was able to negotiate effortlessly the ice on the frozen streets of Salt Lake City.

Visiting him later at the Icebug stand, Evan Wert received a full presentation of the proprietary BUGrip technology and carbide steel studs the Swedish company applies to the soles of its shoes. He then tried on a pair of the company's proprietary ArchFlex insoles and, according to Icebug, was immediately hooked.

"When I saw Gary that day, I knew Icebug had something special," Mr Wert has said. "I am very excited to help share the gift of all-season traction and help this brand realise its potential in the North American marketplace."

FRED COUPLES EXTENDS HIS AGREEMENT WITH ECCO

Danish footwear brand Ecco has extended its endorsement agreement with golfer Fred Couples. He will continue to wear Ecco's BIOM Hybrid shows in competitions and to sport the Ecco logo on his headwear.

Commenting on the extension to his contract with the Danish brand, Fred Couples said: "Before Ecco, I was always a very traditional shoe guy, but now really all I put on are the Golf Street and BIOM Hybrid styles. They've both got a great look, are so comfortable and provide the traction and stability I need when competing. Plus, I love that I can wear them all the way from my house to the golf course and back."

In the course of his career, Fred Couples has captured 15 PGA Tour titles, including the 1992 Masters.



POPULAR FIGURE IN FRENCH FOOTWEAR AND LEATHER INDUSTRY DIES

Lyon-based footwear and leather research and training centre CTC has announced the death of Marie-Claude Gazarossian.

She was the personal assistant to Yves Morin, the managing director of CTC and current chairman of the International Union of Shoe Industry Technicians, UITIC. She was also the assistant general secretary of AFICTIC, the French Association of Leather Industry Chemical Engineers and Technicians, which represents France at the International Union of Leather Technologists and Chemists Societies.

Her death, which happened as the result of complications after an operation at the end of May, was completely unexpected. She was 58 years old.

"Marie-Claude played a vital role in the French industry, acting as the crucial link between CTC, businesses, professional federations, community groups and institutional and political partners," CTC said in a statement. "She was a vital part of the company's DNA, she was at the very heart and soul of CTC."

She started working at CTC in 1975 and served as personal assistant to each of the organisation's last three managing directors: Jean Deleplanque, Marc Folachier and Yves Morin.

FOOTWEAR WORKERS' HEALTH STUDY TO DOUBLE

Academics from the University of Guanajuato have announced that they will more than double the scope of a study they have carried out on links between workers' health and conditions in footwear factories in the state, which has Mexico's highest shoe production.

Early results from the exercise, involving 94 workers from four companies, suggest, according to the researchers, high levels of diabetes and hypertension (high blood pressure) among footwear factory workers.

One of the researchers, Miriam Quiroz, has told local media: "This is about lifestyle, but working conditions are also an important factor in this." She also said workers often appeared reluctant to follow health and safety instructions in the workplace, including a reluctance among male workers to wear protective masks while working with solvents; they complained that the masks are cumbersome and, in some cases, "too effeminate".

The study will now widen to include 366 workers from eight local companies.

TANZANIA: PRESIDENT WANTS STUDENTS TO HOOK UP WITH INDUSTRY

The president of Tanzania, Jakaya Kikwete, visited the Dar es Salaam International Trade Fair in July and said the quality of locally made products was visibly better than in previous years. He said the time was right for mass-production of some items, including leathersgoods and footwear.

President Kikwete said he wanted initiatives such as Tanzania's Vocational Education and Training Authority and the Dar es Salaam Institute of Technology (DIT) to build stronger links between the skills young people were learning from them and

He said footwear and leathersgoods produced by DIT students were a case in point. "Work with industries so that these shoes are produced in plenty for the public to buy," the president said. "On your own it will not be possible to produce massively."

MINISTER REPEATS TARGET FOR ARGENTINA

Argentina's industry minister, Débora Giorgi, was guest of honour at the latest edition of the Efica footwear exhibition in the Costa Salguero exhibition centre in Buenos Aires.

Ms Giorgi urged Argentina's footwear manufacturers to use their creativity, their technical know-how and their production capacity to grow exports, broadening the markets to which they ship Argentinean shoes.

She went on to say: "Footwear is a strategic sector for the development of Argentinean industry. We have had a marvellous decade, increasing our annual shoe production by 140% and creating 35,000 jobs."

The minister said production levels had reached 120 million pairs in 2012 and repeated the target of reaching 200 million pairs by 2020.

LEATHER SHORTAGE HITS LOUBOUTIN'S COSTS

High-end shoe designer Christian Louboutin cited raw material shortages when questioned about rising shoe prices by the New York Times.

The French designer, whose shoes cost a minimum of \$600, said: "It is more expensive to make shoes now. And it's for a very boring reason."

With the strengthening euro against the dollar, the cost of producing shoes in Europe has increased, he explained, and a perceived leather shortage has led to luxury houses buying their own tanneries. "Now there is a gap of raw materials and leather, which puts the prices up," he said, adding that his costs have doubled in five years.

PUMA POACHES CREATIVE DIRECTOR FROM O'NEILL

Sportswear company Puma has appointed Torsten Hochstetter as global creative director, with responsibility for designing, creating and developing the sport performance and sport lifestyle collections of the brand, including footwear, apparel and accessories.

Mr Hochstetter was most recently creative director at US surfwear company O'Neill. Prior to that, he worked for adidas in Germany, the US and Japan, holding positions including creative director of sport performance and creative director of sport style.

"Torsten Hochstetter is a proven expert in the sporting goods and fashion design industry," said Björn Gulden, CEO of Puma. "I am pleased we have a design expert coming on board, bringing extensive experience and know-how to our company."

BACKWOODS, DECKERS AND PATAGONIA EXECS TO HEAD OUTDOOR INDUSTRY BOARD

The US-based Outdoor Industry Association (OIA) has announced a new board which includes Jennifer Mull, CEO of Backwoods, as chair; Zohar Ziv, chief operating officer of

Deckers, as first vice chair and Casey Sheahan, CEO of Patagonia, as second vice chair.

New or re-elected voting board members serving three-year terms include Mark Satkiewicz, president of SmartWool Americas, and Jim Zwiers, president of Wolverine Outdoor Group.

Newly appointed non-voting board members include Peter Bragdon, senior vice-president of legal and corporate affairs at Columbia Sportswear, David Labistour, CEO of Mountain Equipment Co-op, and Nora Stowell, vice-president of sales at Amer Sports Group. 📍



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EXPANDED TPU RIGHT FOR RUNNING SHOES, BASF SAYS

Specialty chemicals manufacturer BASF has wasted no time in proposing its new Infinergy expanded thermoplastic polyurethane (E-TPU) product as technology that will be of interest to sports shoe manufacturers and brands.

On bringing the new closed-cell particle foam to market, it highlighted that sports brand adidas had been involved in an early joint-project, developing a new running shoe called Energy Boost "in close partnership" with BASF.

"When you talk to runners," the chemical company stated, "they always express a need for good cushioning. In running shoes, this is the function of the midsole; in just a few milliseconds, it absorbs the kinetic energy generated by the runner as the foot lands and returns some of it to the runner while the foot is pressed down. High elasticity and deformability in the material that is used will increase the efficiency with which this happens."

Runners used to have to choose between hard, elastic competition shoes or very soft training shoes offering a lot of cushioning, it continued, but insisted that adidas and BASF have resolved the dilemma by working together on it for almost three years.

MAIN'S MACHINERY UPDATES ON SHOW AT SIMAC

Italian injection-moulding footwear machinery provider Main Group has said upgrades to its own technology and reconfiguration to make its own factory as efficient as possible have reduced its costs and allowed it to offer machines "to suit all budgets".

The Veneto-based company has said this is particularly true of its static soling technology and it has revealed

that it will have a version ready to show footwear manufacturers at the Simac exhibition in Bologna, from October 9-10.

D3O LAUNCHES FOOTWEAR CUSHIONING MATERIALS

UK-based smart materials specialist D3O has developed a new range of cushioning materials for footwear applications including athletic, industrial and military markets.

The company, which focuses on impact protection solutions, has said its new products are a response to increased customer demand for low-density, durable, shock-absorbing materials for footwear.

Material development manager, Phil Sheriff, said: "Feedback from wearer trials has been extremely positive. We have been able to bring our expertise in polymer engineering and enhanced chemistry to the footwear industry."

STRATÉGIES RELEASES NEW ROMANS CAD

French leather industry software developer Stratégies has released a version 9.8 of its Romans CAD application.

New features include tools to make design easy through the use of "intelligent shapes", and to enable designers to change their models dynamically in 3D. They can control how the software organises their data and stores their projects in "a single-scene design environment", making sharing designs easy.

Stratégies describes Romans CAD as a single solution for pattern making, 3D prototyping and data management. Information can be shared between design, marketing, web support and production departments.

SYMPATEX PRESENTS 3D MOISTURE-TRANSPORTING LAMINATE

A new 3D laminate by Sympatex Technologies promises increased moisture transport with a small carbon footprint.

Foam points on the inside of the Phaseable laminate touch the skin, and during the recovery phase of the athlete, an insulating layer of air is created between the skin and the laminate. When the physical activity is increased, moisture is produced, which lets the compact hydrophilic membrane swell up and the foam points disappear so the laminate gets closer to the skin, improving moisture transport.

NEW SUPPLY CHAIN TRACEABILITY TOOL FROM TEXBASE

Specialist software provider TEXbase has launched GuardianSM, which it describes as an “advanced solution for management of corporate and social compliance requirements”.

It says regardless of size or complexity, brands and retailers can build transparency across their global supply chain as the system enables standardisation, easy accessibility and visibility across a global user base.

Features include a solution for managing product specifications, testing plans and results required by the US's Consumer Product Safety Improvement Act; and CSR Guardian, which allows companies to track and measure their corporate social responsibility programmes.

NEW FOOTWEAR TEXTILE FROM INVISTA

Taiwanese textile company Tiong Liong has collaborated with Invista to expand its Air Flow Technology (AFT) fabric with new knit constructions featuring enhanced abrasion and snagging resistance.

Targeted primarily for outdoor, athletic and safety footwear, the breathable fabrics can also be used in mesh applications in backpacks.

The Cordura AFT fabric collection now includes high tenacity polyester and nylon 6,6 offerings in a range of knits capable of foam or felt lamination and 3D spacer fabric constructions, suitable for sports shoes.

Cindy McNaul, Cordura brand director, said: “Our aim is to improve the end-user experience by supporting the development of lightweight products designed to withstand extreme conditions.”

NEW ZEALAND SHEEPSKIN IDEA VALUED AT \$100M PER YEAR

New Zealand's Leather and Shoe Research Association (LASRA) has said a government-funded project to make the country's sheepskin leather strong enough for use in the mainstream footwear market has reached a successful conclusion.

The LASRA Ovine Consortium project, funded by the ministry for business, innovation and employment

set out to find ways of processing sheep and lambskins to make leather that is durable enough to compete with bovine leather in the mainstream shoe market, rather than just in niche markets such as those of slippers and UGG-style boots with soft uppers.

Researchers at Massey University have been analysing the molecular structure of sheep and lamb skins to find a way to make them as strong as bovine leather. A Massey professor specialising in nanotechnology, Professor Richard Haverkamp, and two LASRA doctoral students, Melissa Basil-Jones and Katie Sizeland, came up with a technique of using enzyme technology to process sheepskins.

LASRA senior research scientist, Dr

Richard Edmonds, presented the results of this research at the IULTCS Congress in Istanbul in May 2013.

Media in New Zealand have now reported that the government has put the potential value of the idea at almost \$100 million per year and LASRA has filed for a patent on the process. 

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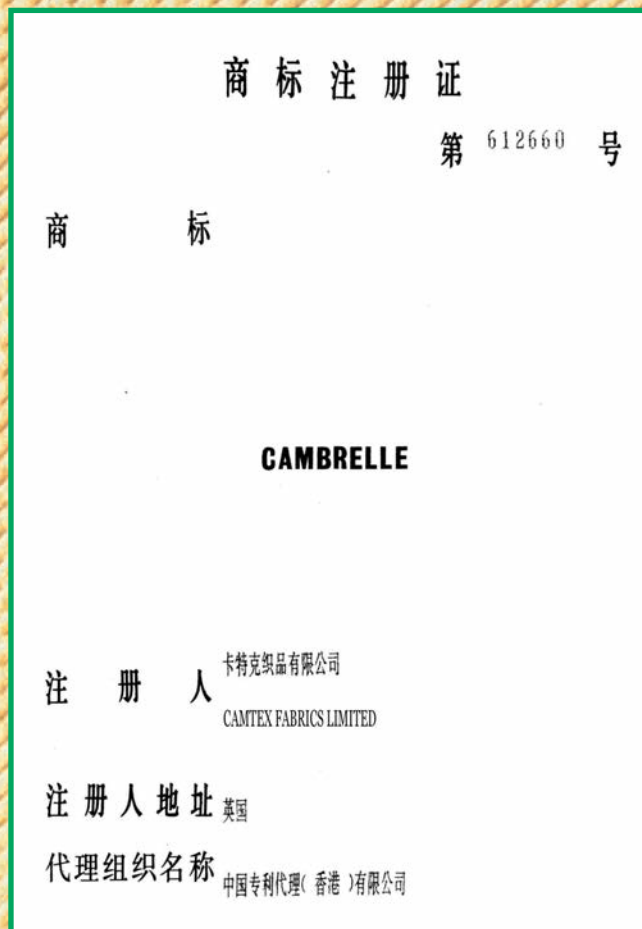
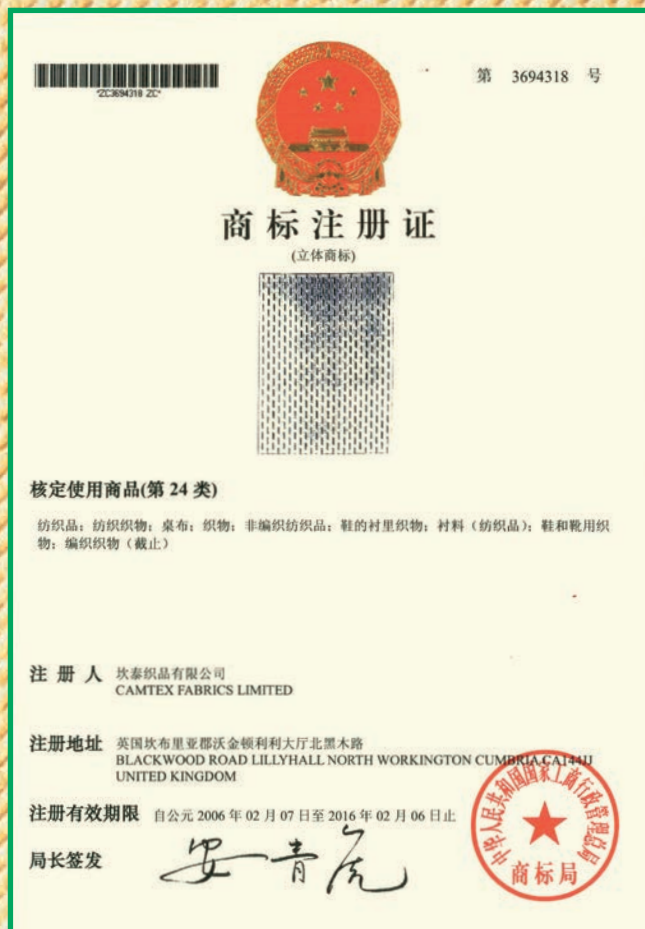
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Backtrack

World Footwear's publishing cycle and limitations on space make it impossible for us to run more than a carefully selected sample of news from across the industry. However, we publish hundreds more stories on **www.footwearbiz.com**. The site is updated every day with news from every continent and every part of the industry, making footwearbiz.com one of the most

comprehensive archives of news anywhere on the web for the global footwear industry.

We list below just a few of the headlines that have appeared on the site in recent weeks – **www.footwearbiz.com** allows you to read those you have missed.

8.08.13

Asians 'appreciate quality' – Tod's CEO

07.08.2013

High-end shoe brands at Best of Britannia

06.08.2013

Italian retailers must promote 'Made in Italy', new report says

05.08.2013

Five Ten soles will be for adidas only
Vibram FiveFingers named ugliest shoes
Weyco posts higher sales

01.08.2013

New mountain boot from Mammut
Footwear relaunch a success for Coach
Heavy discounting at UK footwear retailers
Stuart Weitzman owner reports sales decline

31.07.2013

Ethiopian shoe brand ties up with OrthoLite

30.07.2013

Sales fall at Deckers Outdoor

29.07.2013

Jack Wolfskin launches fresh corporate identity
Canterbury launches a rugby boot 'for every position'

26.07.2013

New CEO faced with Puma sales decline

25.07.2013

Confidence in footwear innovations at Under Armour
Strong quarter for Crocs
Heat wave boosts Shoe Zone sales 114%
Men underestimate importance of good footwear - survey
Delcam targets Vietnam with two appointments

24.07.2013

Baffin revamps roll-up rain boots

23.07.2013

CLE to take Indian delegation to Bangladesh event

22.07.2013

OIA claims victory in import tariff debate
Icebug insists it's not 'winter only'

19.07.2013

Local footwear is best, say Vietnamese
Leather and footwear provide a lift for Spain

18.07.2013

400 brands ready for Moda Footwear
Kindy wins licence to make shoes under IKKS brand
Geox group buys Diadora rights in China
US: Footwear workers' charity teams up with retailers

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A trip to the US at the start of the twentieth century provoked a lifelong passion for cowboy boots in Spanish leather expert Andrés Sendra. A hundred years later, his grandson, Javier, is keeping the passion alive.

Sendra stays the course

It's 100 years since Andrés Sendra returned from a long trip to the US to his home in the small leather and footwear-producing town of Almansa in Spain to set up his own boot brand. A passionate admirer of the cowboy boots he had seen on the other side of the Atlantic, he founded Sendra Boots and set about making his own designs based on the original. A century later, the company is still there, still producing in Almansa, still specialising in western-style boots, still successful and still run by his family.

"It seems like a miracle," says his grandson Javier Sendra, now the company president. He relates that, even before the boot brand, this business was in the Sendra family's blood: Andrés Sendra was the son of an artisan tanner (also Andrés) from Mislata, near Valencia, who built up a business supplying footwear manufacturers of the day with patent leathers. In 1900, Andrés junior went to find his fortune in the US and used the knowledge and skills he had learned from his father to work as a leather trader there, mainly supplying footwear firms.

American dream

He took great interest in the western-style boots many footwear firms produced, recognising in them a style of riding boot that Spanish settlers took to the Americas in the fifteenth century. The style had evolved, of course, with people in the US wearing them not just in the saddle or in the stockyard, but also on construction sites and for other physical jobs. Andrés Sendra admired the workmanship that went into them and the design and decoration that bootmakers were able to add, adapting each pair to the taste of their customers. In 1905, still aged only 20, he went home, taking with him his new-found love of the cowboy boot. With the footwear industry in Almansa beginning to grow, he left Valencia with one of his brothers and set up his own footwear operation, which in 1913 became Sendra Boots. His son, José, and now his grandson, Javier, have

Sendra Boots intends to mark its centenary by working harder than ever. CREDIT: SENDRA



continued to make his American dream a reality.

The current company president says now that it took until around 1960, when he was born, for his father to begin to secure some export business. "Spain was beginning to open up a little bit by then," he says, although because this was fully 15 years before the end of the inward-looking regime imposed by General Francisco Franco at the end of the Spanish Civil in 1939, he admits that it must have been a difficult step for his father to take. "As everyone knows, Spain is going through a very tough economic crisis," he continues. "But the country has gone through tougher crises in the past. My father had no reliable electricity supply, for example."

Rich in knowledge

Even so, Javier Sendra believes that setting the business up in Almansa has also brought advantages. He says he is far from the only one in the company to be carrying on the work of previous generations of his family. He has people making boots (and shoes) now whose parents and grandparents also worked for Sendra. "The company has managed to retain a tremendous amount of know-how," he says.

Its founder never lost his desire to learn. He visited the 1929 Barcelona International Exposition and was greatly taken by displays of the Goodyear welt method of footwear construction that he saw there on a stand set up by Leicester-based United Shoe Machinery. Andrés Sendra invested in the necessary machinery and learned the technique and brought Goodyear to Almansa. "We still have the invoices for the machinery he bought," his grandson says. "In fact, we still have machines that have been in the factory and they still work. My grandfather leased them at first. They had a counter on them and once a year or so, the United Shoe representative would come from Barcelona and make out a bill for what we had used."

Material concerns

He adds all this received wisdom and experience to high-quality materials to make the Sendra collections of the present day. He picks model 9479 (they all have numbers), a Goodyear-welted brogue, as an example. It has a calfskin lining and upper leather from Les Tanneries Du Puy in central France ("theirs is the only leather that we feel we can use to make this type of footwear"). The thick sole leather comes from Igualada near Barcelona. But the knowledge that has gone into making the shoe is also hard to find and takes a long time to amass, he adds.

Mr Sendra himself prefers boots to shoes. Among his current favourites are cowboy boots in colourful python skin (reticulated python from a reptile farm in Indonesia) with lots of rivets for their metallic effect. This makes you think that while his grandfather and his father would recognise the shape and the feel, perhaps the look would seem a little strange to them.

"They'd be astonished," Javier Sendra says. "Things used to be a lot simpler. This business today means you have to keep changing, trying to keep up with fashion and trends that move so fast. It's almost as though we have to have different samples for every city in which we have a presence. It's madness. But by travelling a lot and listening very carefully to



Cowboy boots with some Spanish flair have been Sendra's trademark for 100 years. CREDIT: MESSE DÜSSELDORF

customers, you can learn to interpret their tastes and their requirements. It's a business that requires complete dedication. You don't have time for hobbies or leisure. Either your footwear factory becomes your hobby or you cannot continue. This is a total passion and there is nothing part-time about any of it. I'm lucky because I love every aspect of it, every part of the process."

He says Sendra will mark its centenary by working harder than ever. 🌐



The Danish footwear brand has had to redesign some of its children's shoes for the Russian market for autumn-winter 2013-2014 to remove Gore-Tex membrane technology.

CREDIT: BO TORNVIG/ECCO

Ecco takes no chances in Russia

Danish footwear brand Ecco is famous throughout the world for its integrated supply chain: its own tanneries make its own leather; its own factories make its own shoes; its own shops sell them to the public. To put some figures on this, Ecco runs four tanneries, in the Netherlands, China, Indonesia and Thailand. It has footwear production facilities in Portugal and Slovakia, as well as in the three Asian countries where it makes leather. At the end of 2012, there were 1,095 Ecco-branded footwear retail outlets around the world, of which Ecco itself operates 181. A sister company, KRM, operates 123 of the stores and the remaining 791 are in the hands of franchise partners. Its shoes are also on sale in a further 14,000 non-Ecco retail outlets. Together, these parts of the company, and its partners, made and sold 20.2 million pairs of shoes in 2012. "Customers expect more frequent deliveries of attractive new products, easy purchase processes and an ever-higher level of service," the footwear company says. "Ecco's control of the entire supply chain should allow us to meet these expectations."

For the most part, this appears to work. Serious flooding in Thailand in October 2011 had a very direct impact on Ecco's operations in Ayutthaya, reducing its global production capacity by one-third overnight. Because it runs its own production

Legislation that has come into force regarding the lining of children's shoes in Russia is lacking in clarity. Danish footwear brand Ecco has decided to err on the side of caution, with knock-on effects for suppliers.

plants, though, it was able to ask its other units to increase production to minimise the effect on customers; this included starting up production at a plant in Santa Maria da Feira in northern Portugal that had stopped making shoes in 2009. Ecco had kept in place a research and development team in Portugal, but in 2012 hired more than 400 new workers there to make shoes again in the wake of the events in Thailand. "These events galvanised the entire Ecco organisation into a superb effort throughout 2012," the company states.

Russia in a rush

Some things, however, appear to be outside the control of even Ecco. The footwear brand has reported that changes in



Linings for children's shoes in Russia, Belarus and Kazakhstan must contain no synthetic material, according to a July 2012 directive. CREDIT: MICHAEL DWORNIK/ECCO



Ecco keeps careful control of its own leather supply.

CREDIT: MICHAEL DWORNIK/ECCO

regulations that have come into place in Russia have forced it to alter some elements of the collection it is currently preparing to ship to that market for sale in the autumn-winter 2013-2014 season.

Specifically applying to children's shoes, the change, which came into place in July 2012 shortly before Russia became a full member of the World Trade Organization, is that now all children's shoes in the Russian market must have linings that are made wholly from natural materials.

Ecco is a great champion of natural materials as its continuing commitment to producing its own leather shows. However, it has also included Gore-Tex membrane technology in some of its shoes for many years, layering the membrane into its leather uppers or laminating it into high-performance textiles inside the upper and carefully sealing it. "This way we can create outdoor shoes that are breathable, durable, waterproof, and engineered to keep feet dry and comfortable on all adventures," the company stated.

After carefully considering the new regulations in Russia, Ecco has decided to take Gore-Tex out of all of its Russia-bound children's shoes for autumn-winter 2013-2014. The Danish footwear brand told *World Footwear* that the purpose of the new regulation is to secure the safety of products used by children and adolescents, and that part of this is that the lining of children's shoes has to be made entirely from natural materials such as cotton, leather or wool. "Any use of synthetic materials is prohibited," the company said. However, its vice-president for group communication, Steen Frenz Laursen, added that the technical regulations are still unclear. "They do not define what 'lining' is," he said. "The authorities have not

provided any interpretations of the regulations."

He made it clear that the regulations make no specific reference to Gore-Tex and said Ecco had been forced to make its own interpretation of what would be acceptable in Russia in the face of the new rules. He pointed out that two other markets, Belarus and Kazakhstan, are also covered by the change.

Technical trade barrier

"Ecco views the new regulation as a technical trade barrier," Mr Frenz Laursen continues. "These products do not cause any safety hazard. Also, our products are sold in 90 other markets with no such requirements against synthetic materials. Nevertheless, we have adapted to the regulations to the best of our ability by developing and manufacturing an entirely new collection for this segment of the market." He said quality and comfort remain "at a very high level" for the altered collection for Russia, Belarus and Kazakhstan.

WL Gore, which makes Gore-Tex, has played down the possible consequences for its membrane technology's future in the Russian market. "This regulation primarily concerns footwear brands that are bringing the shoes into these markets, Russia, Kazakhstan and Belarus," the technology provider told *World Footwear*. "WL Gore & Associates is not directly affected by this regulation. The Gore-Tex brand is not banned in Russia nor did Ecco have problems solely because of incorporating Gore-Tex products in its children's footwear."

It said it would continue to support its footwear brand partners in addressing this issue by providing them with new information as and when it can. 



CREDIT: STEVE LEE

Making it stick

STEVE LEE, STEVE LEE ASSOCIATES

Adhesives are used in a wide number of applications in the manufacture of footwear. The major ones, together with the most important types of adhesive used in each case, are shown in *Figure 1*. The two key areas in terms of volume of adhesive used are lasting and sole attaching, so this article will focus very much on these with especial attention given to the latter.

LASTING

The lasting of uppers (pull-over, toe, seat and side lasting) has been dominated for many decades by the use of hot melt adhesives and has become ever more productive with the development of specialised lasting machinery. This whole area was extensively covered in the article 'Developing the modern toe laster' in the July/August 2013 edition of *World Footwear*, including some of the latest

adhesive developments.

The most startling of these is the innovation by the Italian company Cerim of a water-based polyurethane adhesive that can be used on its lasting machines. It has developed systems that

can easily switch between hot-melt and water-based polyurethane as required by whatever means the footwear needs to be produced. This patented process is a first step away for the lasting process from the dominance of polyester and

FIGURE 1

APPLICATION	ADHESIVE
Topline folding	Hot melt polyamide
Fitting linings	Natural rubber latex, hot melt polyamide, EVA
Toe puff & counter bonding	Hot melt coating EVA
Lasting	Hot melt - polyamide, polyester; water-based polyurethane
Shank	Hot melt - EVA, polyamide
Sole attaching	Solvent or water-based polyurethane, polychloroprene primers
Heel covering	Solvent or water-based - polychloroprene
Insock insertion	Natural rubber latex, acrylates

polyamide hot melts. While it scores highly on points such as lower energy costs and the use of eco-friendly products, more important is that the use of a water-based polyurethane adhesive rather than a hot-melt results in a great improvement in the quality of the final product. Water-based polyurethane offers a thin, uniform and flexible film of adhesive rather than the thick inflexible bond produced by hot-melt. This greatly improves the flexibility of the shoe and also improves its overall shape.

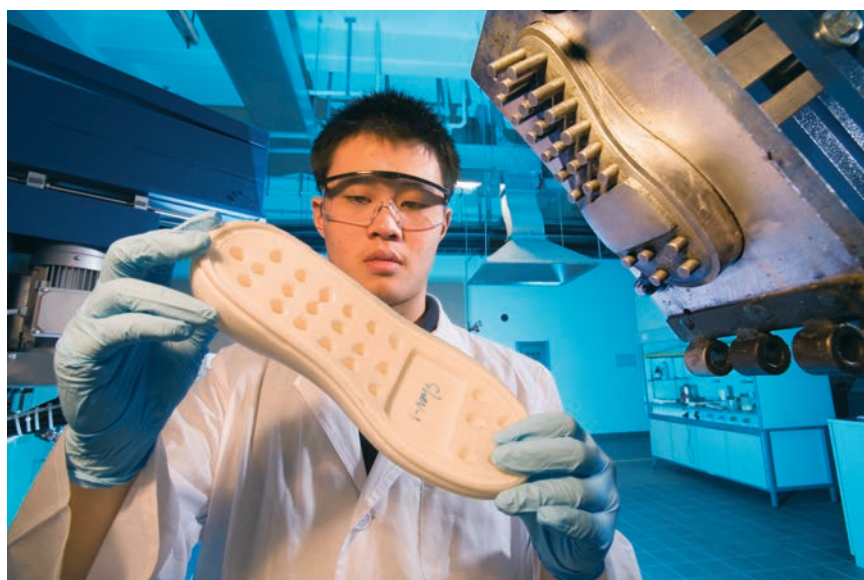
SOLE ATTACHING

Sole attaching has developed dramatically over the last 90-100 years closely linked to the development and commercial availability of new polymers for both soling and for adhesives. In the 1920s and 30s, the major soling materials were natural crepe, vulcanised rubber and leather. New methods to attach them were gradually developed using either solvent-based natural rubber or nitrocellulose adhesives until, by the mid 1940s in the US at least, a high proportion of women's soles was attached by adhesive, mainly solvent-based nitrocellulose.

These early developments depended upon the presence of solvents in the adhesive at sole attachment for the adhesive films on the sole and upper to coalesce. This was achieved either by limiting the drying of the adhesive or by deliberately adding solvent just before sole pressing to reactivate the previously dried films. These nitrocellulose solvent-based adhesives were only suitable for bonding fibrous materials and their bond strengths were all below those accepted as normal today. Natural rubber adhesive bonds also lacked the stability of present day synthetic polymers and were prone to break down under the effects of heat, grease, flexing and copper contamination. Their main usage was therefore restricted to attaching crepe soles. Indeed, prior to 1940, available adhesives lacked the necessary versatility to bond the range of different materials which were to be found in stitched-on constructions.

POLYCHLOROPRENE ADHESIVES

The Second World War stimulated commercial production of synthetic polymers that soon found use as soling



Polyurethane adhesives have been highly successful as they can be used with such a wide range of soling materials. CREDIT: GFCF

materials. Until about 1950, solvent-based nitrocellulose remained the only option for stuck-on sole attachment. By then, solvent-based nitrile and polychloroprene adhesives were also starting to be used, with the latter the more popular because of their superior coalescing ability and ease of activation. The rapid growth of the stuck-on process during the period 1950-65 and based on vulcanised rubber followed by plasticised PVC sole units, was linked to the parallel development of excellent solvent-based polychloroprene adhesives capable of heat reactivation. The ability to reactivate pre-coated components days or even weeks later, gave the stuck-on process a degree of flexibility which made it highly attractive to shoe manufacturers.

The development of isocyanate solutions was another important step during this period as these could be added to the adhesive just prior to application. The combination provided greater heat, grease and solvent resistance, and frequently improved adhesion qualities. However, its addition also had the adverse effect of decreasing pot-life of the adhesive.

Solvent-based polychloroprene adhesives can be adversely affected by the grease content in leather whereby free fatty acid combines with minerals in the adhesive to form metal soaps that prevent good coalescence. These substances can also be found on the surface of many vulcanised rubbers and

may again lead to bad adhesion with solvent-based polychloroprene adhesives. Special primers, such as SATRA's Lacsol, were developed to remove this 'soap' and so improve adhesion.

POLYURETHANE ADHESIVES

By the mid 1960s the footwear industry was increasingly focused on the use of plasticised PVC for soling and upper materials and the limitations of solvent-based polychloroprene as an adhesive became more apparent. It did not have a good affinity to PVC and was susceptible to the softening action of the plasticisers used. Primers were developed for coating the lasted margin of PVC uppers prior to applying the adhesive and which made it possible to bond vulcanised rubber soles but not PVC.

Solvent-based polyurethane adhesives first appeared in the mid 1960s with excellent adhesion to plasticised PVC. These early polyurethane adhesives were expensive due to polymer and solvent costs. They also lacked the easy working properties such as good spotting tack of solvent-based polychloroprene adhesives and their inherent ability to stick to synthetic vulcanised rubbers. They did however show excellent resistance to grease and plasticisers. Furthermore, the addition of isocyanates was found particularly useful in modifying their heat resistance and adhesion to vulcanised rubber.

By the end of the 1960s, solvent-

based polyurethane adhesives were increasingly used on resin rubber soling either as a two-component adhesive with the isocyanate mixed into the adhesive just before application or with it used as a primer on the resin rubber before application of the adhesive.

Different approaches were taken to solve the problems of obtaining good adhesion between the sole unit and upper, especially when using vulcanised rubber. Certain countries favoured the use of two component adhesives with the isocyanate component being added just before use. Others preferred one-component adhesives with improved heat resistance and good adhesion to rubber obtained by compounding additives into the formulation together with isocyanates, although the latter were inhibited from reacting fully until the adhesive dried.

HALOGENATION

Polyurethane and thermoplastic rubber sole units were both introduced during the 1970s and, whilst there was no problem bonding the former using solvent-based polyurethane adhesive once the mould release had been removed using a solvent wipe, there were more problems with the latter. It was work by SATRA on the development of a halogenation wipe called Satreat that finally solved the problem and allowed thermoplastic rubber soles to be successfully bonded to uppers using solvent-based polyurethane adhesives.

This halogenation treatment was found to be equally effective on vulcanised rubber sole units and was made commercially practical by the development of low toxicity solvent halogenation solutions such as Satreat that made it possible to use them in the shoe factory. The advantages of halogenation in preparing vulcanised rubber surfaces for bonding with solvent-based polyurethane adhesive has led to the worldwide use of the system and to greater displacement of solvent-based polychloroprene adhesives by solvent-based polyurethane adhesives than might have otherwise been expected.

In the late 1970s special adhesives, both acrylic-modified polyurethanes and polychloroprenes, were developed for bonding thermoplastic rubber



SATREAT made it possible to use polyurethane adhesives on a wide range of soling materials.

CREDIT: SATRA

without halogenation. These are still used successfully but are less versatile than halogenation. Special polyurethanes for bonding PVC blends are also available. The appearance of other new polymers for solings such as EVA and POE has led to the developments of special primers enabling them also to be bonded with solvent-based polyurethane.

Thus solvent-based polyurethane adhesives gained ground rapidly through the 1970s and 1980s, becoming particularly dominant in the 1990s and far exceeding the use of solvent-based polychloroprenes. For over 50 years sole attaching adhesives were therefore almost exclusively solvent-based, although health and safety hazards linked with solvents—especially flammability and toxicity—had to be addressed in the workplace.

SEDS AND VOCs

The next great concern was the environmental pressure on air pollution which began in the 1990s. This led to the introduction of various SEDs (solvent emission directives) by developed countries. The European

Community act for instance was originally passed in 1999 as Directive 1999/13/EC, followed by Directive 2004/42/CE and then Directive 2008/112/EC. This imposed strict levels on the emission of VOC's (volatile organic compounds) due to the use of solvents. The purpose of an SED is to prevent or reduce the direct and indirect effects of emissions of volatile organic compounds into the atmosphere and potential risks to human health.

These SEDs obviously affect the type of adhesive that can be used by the footwear industry both in the country/region where the directive is enacted but also on the sourcing of footwear from elsewhere. For instance, back in the early 2000s it was surprising to find that the introduction of some of the early water-based polyurethane adhesives by HB Fuller was taking place in China. The explanation for this was twofold. First there was pressure from major brands such as Nike, Timberland and Clarks to be seen to be environmentally sound. Second, it was often easier to introduce the new equipment needed to handle water-based adhesives in the rapidly evolving



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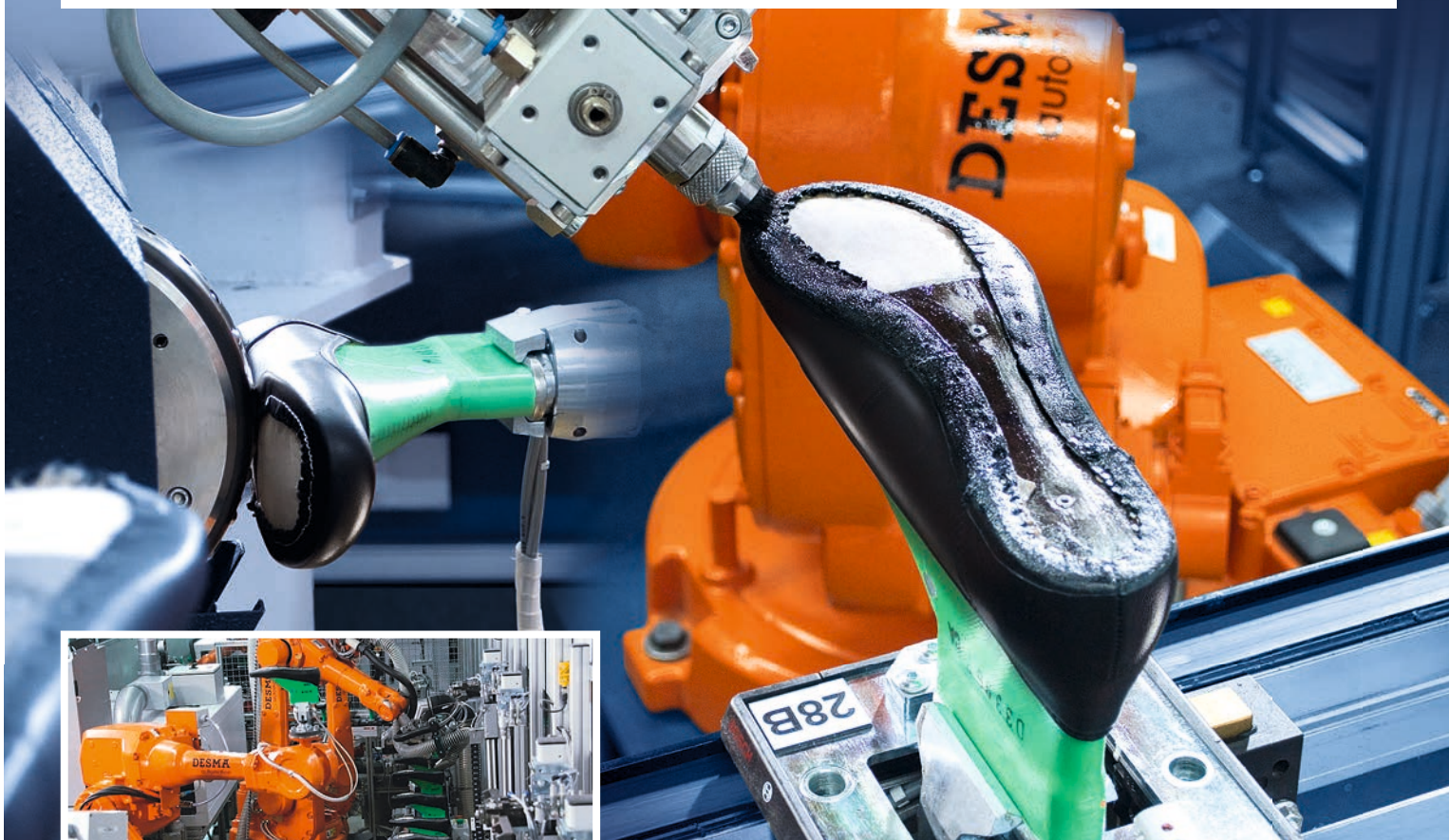
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and growing production plants in China. It took longer to replace the solvent-based equipment then in use in the developed world's factories.

The amount of focus on the removal of VOCs is shown by the attitude of adidas which has issued figures for the changes in VOCs in its athletic shoes. In 1999, a pair of shoes contained on average 140 gram mostly from the adhesives involved. By 2010, it had been driven down to 25 gram. Quoting the figure as part of an 'individual roadmap' towards zero discharge of hazardous chemicals that it released in parallel with a joint statement made with five other companies in November 2011, the company said "We support in principle Greenpeace's aspiration for a world that is free of hazardous chemicals. However, while we are committed to being part of the solution, we have to acknowledge that the management of chemicals in multi-tiered supply chains is a complex challenge, requiring many actors to play a role in achieving this goal. The adidas group works with more than 1,200 contract factories in 69 countries around the world." It is therefore clear that major companies are serious about their environmental position and intention to reduce damage to the environment. Water-based adhesives will therefore soon dominate the footwear industry as they already do in so many others.

WATER-BASED ADHESIVES

The key background to water-based adhesives is that nowadays it is possible to disperse many polymers to form a latex or emulsion. A latex or emulsion is defined as 'a stable colloidal dispersion of polymer particles in an aqueous medium'. Polymer particles, each comprising thousands of tiny (100-200 nanometres diameter) individual molecules but still exceedingly small, are kept in suspension by the action of surfactants, stabilisers and other additives. Because these particles reflect light, the dispersion is usually milky white in appearance. Whereas solvent-based adhesives typically have a solids content of 20-25%, water-based products are normally in the range of 40-50%. This means that less adhesive has to be used and less carriage shipped from adhesive producer to end-user.

As with solvent-based adhesives,

water-based dispersions need to be dried after they have been applied so that the polymer particles are forced closer together until they coalesce into a film. The drying of water-based adhesives does take a little more energy than that required for solvent-based products but the higher solids content helps to reduce the amount.

Polyurethane dispersions (PUDs) suitable for formulating water-based polyurethane adhesives have now been available for over 20 years. Because they have molecules agglomerated as particles in water rather than individual molecules in solvent, their viscosity is inherently low, although it can be increased by thickeners if necessary. A big step forward was the development of isocyanate curing agents compatible with water-based polyurethane adhesives, enabling two-part systems to be offered. This is difficult to comprehend as it is well known that isocyanates react readily with water. However, chemists have played their part and developed isocyanates that 'like' PU polymers more than water and so prefer to act with them rather than the water content one would normally expect.

Polychloroprene dispersions are also well established, enabling water-based adhesives for many purposes to be formulated. Like their solvent-based counterparts these usually require the incorporation of a compatible tackifying resin. They are used in shoemaking for temporary sole attachment in welted footwear and other ancillary operations.

The formation of stable aqueous polymer dispersions requires good control of both formulation and process methodology. They are sensitive to various influences that can cause instability and irreversible coagulation of the polymer to form rubbery lumps. This means that water-based adhesives, both polyurethane and polychloroprene, should always be stored as recommended by the supplier and usually above 5°C to avoid freezing. Additions of chemicals, including water, should never be made unless these are specifically permitted.

FURTHER IMPROVEMENTS

Whilst these water-based adhesives dominated many aspects of footwear manufacturing during the 1990s, a fear of bond failure between the sole and

upper meant that many manufacturers preferred to continue using solvent-borne products for sole attachment. However, in recent years, water-based formulations suitable even for this demanding application have emerged through the addition of high ethylene-oxide content polyethers that help to ensure the desired high molecular weight structure of the polyurethane.

The resulting crystalline polymer backbone can create a one-component aqueous adhesive that forms bonds capable of supporting a 0.5 kg weight at temperatures above 100°C. After conditioning the bond at 80°C without a weight for 3 minutes and then loading it with 2.5 kg at 80°C for 5 minutes, the adhesive parted at speeds of less than 1 mm per minute compared with 14.5 mm/min for traditional water-based polyurethane formulations. Such properties makes the adhesive especially well suited for use in heat reactivation bonding of plasticised PVC, polyurethane or EVA soles to uppers made of either real or synthetic leather.

Another development has recently come from the Brazilian component and adhesive producer Gruppo FCC which has reported promising progress with a new water-based product for thermoplastic rubber (TR) soling materials which can be applied without the use of a primer. The company estimates that around 30% of the 900 million pairs of shoes made in Brazil each year have TR soles, so this is a significant step forward.

Early reaction has apparently been extremely positive and several manufacturers have already started to use it. They have reported savings in production costs as a result of a reduction in the amount of pre-work that needs to be performed as well as savings in protective equipment for operators. Naturally, VOC emissions are also down.

Thanks to currently available surface preparation and chemical technologies, solvent-free adhesives can now be reliably used throughout all traditional footwear production processes. But even though adhesive companies can now help shoemakers eliminate solvents completely, should they and will they? The data from adidas shows that one company at least is pursuing such an end and one can be sure they are not alone. 

Born in the USA

The United States of America can truly be said to have been the main driving force behind the mechanisation of the footwear business. With a large domestic population it also quickly developed a substantial footwear industry to supply it. This in turned spawned a supply chain to feed the factories with all the materials, machinery and components that it required. While very little of the industry and its infrastructure is now left, there still remain some significant component suppliers which, while still headquartered in the US, have become a significant presence in the global market and offer a range valuable products to the world's shoemakers.



Auburn Leather's cutting teams can generate up to 150,000 laces per day CREDIT AUBURN LEATHER

AUBURN LEATHER

Any mention of Kentucky immediately brings to mind Blue Grass country, Bourbon whiskey, thoroughbred horses and the Kentucky Derby. The state also contains the largest supplier of leather shoe laces in the world, Auburn Leather. Established in 1863, the company is still owned by the founding Caldwell-Howlett family and is currently run by fifth generation member Lisa Howlett. Leather laces have been around ever since man first began to secure pieces of animal skin around his feet. They continue to be an important value-added component on a wide range of footwear styles and applications with leading brands worldwide. While Auburn's roots are firmly in the original soil of the US footwear industry, it has successfully built on them over its 150 year existence to make itself the leading supplier it is today.

There is a saying in the company that "A lace is only as good as the leather from which it is cut", so true quality begins with the hides themselves. Auburn continues to use only US Spread Dairy cowhides due to their consistency in thickness and overall quality. Hides are bought in a wet blue state and then processed from start to finish through tanning, colouring and the final cutting of the laces. Exacting standards are demanded, so the company's testing regimen follows industry and brand-specific performance standards. These cover physical properties such as strength, thickness, abrasion resistance, temper and colour fastness to water as well as comprehensive RSL-based (Restricted Substances) testing of the chrome-tanned wet blue leather itself.

Although there are several types of tannage used to process leather laces, Auburn focuses on two primary processes: chrome and alum (aluminium). Chrome tanned laces are the most widely used in shoes and boots. Properly tanned, this leather produces laces with excellent tensile strength and wear resistance, plus a mellow, pliable feel. A chrome tanned lace is claimed to be 'strong yet tie-able'. Alum-tanned laces are more commonly used for sporting goods' lacing such as in baseball gloves and lacrosse sticks or mechanical belting and belt lacing. A number of moccasin



Good quality wetting and welt sewing is essential for producing sound Goodyear welted shoes. CREDIT CHURCH & CO. LTD.

shoemakers still use alum tanned laces for their whip-stitching lace but it is not recommended for shoes that go through any wetting/drying operations.

Colouring is performed in-house where tanned hides are drum-dyed using transparent, soluble aniline dyes which, while imparting good colour, also allows the leather to retain the natural look of its grain surface. Slight shade variation can occur from dye lot to dye lot, however, due to the natural base shade of the hide itself. Recent fashion trends have driven the need for ever more colours and Auburn now boasts over 150 regular colours, giving designers a much wider freedom of choice than ever before.

Additional lace styles recently introduced include metallic foils, braided, folded/stitched leather as well as reformulated traditional styles such as Cougar oil-tanned alum logger boot laces, now available in a new WL Gore-approved non-wicking version that improves water repellence. After 150 years in business, Auburn Leather continues to deliver the highest level of quality and strives to meet the demands of an ever-changing market.

BARBOUR WELTING

Barbour Welting is another company with its origins in the early days of the US shoe industry, in its case being founded by John Barbour in 1892 at Brockton, Massachusetts as the Brockton Rand Company. Eighteen years earlier, the Goodyear welting

process had appeared and was soon in widespread use. John Barbour saw the potential and turned production over to leather welting. In 1923, the company name was changed to the Barbour Welting Company. 90 years on, the company is run by Richard Hynes, whose father had bought the company in 1975, his brother-in-law Bruce Pearson and his sister Nancy Pearson.

When John Barbour started the business, he set out first and foremost to service the needs of his customers and this has remained the company ethos ever since. By always using the best raw materials and workmanship, the company has worked hard to maintain its position in the footwear industry. In this it has clearly been successful as its products remain the number one choice for quality leather welting and randing.

Producing the very best Goodyear welting involves two apparently conflicting objectives. The first is visual such that when sewn into the shoe and edge-finished, the trimmed edge finishes so cleanly that the welt literally blends in with the sole. This suggests the use of a rather solid non-porous material. The second is that a welt needs to be made from soft, supple and flexible leather that whilst capable of holding a stitch also has sufficient tensile strength to hold the shoe together in wear. What makes Barbour welting different from others is years of experience in securing the very best vegetable tanned leather where most is not strictly suitable.

Producing such welting also calls for great skill in selecting and cutting it according to the requirements of the specific type of shoe in which the welt is to be used. Due to fibre variation within one shoulder or butt, the entire piece is never cut for one lot; only certain portions with similar temper and fibre characteristics are used. The machinery employed is almost 100% engineered and built in-house and, the company believes, is superior to any available elsewhere.

For example, the strips of leather from the cutting department are joined on an automatic line with a cement bond reliability of some 99.8%, resulting in joins that are almost invisible. It is this level of quality that has convinced many doubting shoemakers that 'continuous' welting is reliable and, more importantly, saves money compared to traditional cut welts which require the sewing of individual strips into each shoe. In addition, special chemical treatments are used to further 'fine tune' the product to a customer's specific needs. This also helps to maintain consistency of performance from shipment to shipment.

Today, Barbour supplies top quality shoemakers all over the world. In order to do this, it has a 'library' containing a vast number of different styles of welt and randing. Whatever a manufacturer might need in terms of welting for Goodyear constructed shoes or randing for cemented footwear, the company

should be able to supply it. Whereas so many companies have sought to survive by cutting costs and lowering standards, Barbour never has. The very fact that quality Goodyear welted producers have remained recession-proof and are busier than ever shows this to be a sound policy.

AMERICAN + SCHOEN

American & Schoen Machinery Company, a subsidiary of Schoen + Sandt of Pirmasens, Germany, has been a supplier to the footwear industry for over 40 years. While it distributes its parent company's machines and ancillaries for a wide variety of footwear manufacturing applications, it is also active on the shoe component side with its patented Tru-Fit shank system. Shanks are normally made from stamped steel strip and riveted to the insole or, in some instances, wood and then attached using hot melt adhesive. The Tru-Fit system is totally different in that it exploits the extremely high strength-to-weight ratio of fibreglass and resin by the use of a special machine that cuts, shapes and bonds a shank to the insole in one operation.

With the proper size set (this takes less than five seconds), the machine cuts a shank from a reel of Tru-Fit material. The operator locates it against the stops of the shank gauge where it is held by vacuum, loads a shoe onto the jack and depresses the foot treadle. In a seven-second cycle, the machine

moves the gauge holding the limp and wet shank into position over the waist of the shoe and raises the jack so that it is pressed down onto the insole. It then returns the gauge to the loading position and activates the shank to bond it to the insole before automatically releasing the shoe.

Activation has caused the thermosetting resins coating the glass fibres to be permanently set in the shape of the shoe bottom and bond them securely to the insole. The machine is quoted as being able to produce anything up to 1800 pairs per eight hour shift depending on the type and style of shoe and work handling method. Curing quickly as it cools down the shank hardens and becomes stronger than an equal weight of steel. A test cycle equivalent to more than 225 miles of walking carried out by an independent testing laboratory showed no evidence of any failure.

The system is now well proven and is increasingly seen as an effective alternative to steel shanks in many types of footwear. In addition to its physical performance, American & Schoen says it has advantages in terms of cost in that it eliminates the need to carry a large shank inventory, losses caused by shanks becoming obsolete due to style changes, and the risk of lost production time while waiting for a shank supplier to produce new tooling when a new last is introduced. It also means that problems which should not occur but frequently do for a variety of reasons, such as shoes with the wrong size or shape of shank or shanks not accurately located or securely attached to the insole, should be completely eliminated.

IDEAL TAPE CO

Reinforcement tapes are often seen as an unnecessary expense even though they add very little to the cost of an average shoe. This is a mistake as good reinforcing products correctly applied can make all the difference between a shoe that looks good, fits well and keeps its shape, and one that does not. This is particularly true in the case of ladies dress and fashion shoes. The important thing however, is to use a tape that is correctly engineered for the application involved whether it is the top line, back seam or merely general reinforcement.



Applying the shank is both fast and consistently accurate. CREDIT AMERICAN + SCHOEN



Materials are formulated and adhesive coated at Lowell, Mass. ensuring the same quality and performance wherever the tapes are cut. CREDIT IDEAL TAPE CO



Coated materials are converted into tapes and sheets at strategic locations around the world for quick and efficient delivery.

CREDIT IDEAL TAPE CO

Ideal's complete range of products also includes tapes for all types of seam and general reinforcement, sheet materials for use as backers or for specific applications such as the reinforcement of eyelets and other fastenings. The materials used include various weights and combinations of woven natural and synthetic fibres, and synthetic non-wovens. Balancing tensile strength, elasticity and thickness of a particular material chosen against the width of tape cut from it enables a reinforcement to be tailored to a shoe style, upper material or set of factory conditions. The possible combinations are practically endless.

Ideal Tape formulates and adhesive coats the fabrics and non-wovens used in its reinforcement products in Lowell, Massachusetts. It converts these into tapes and sheets again in Lowell and, also, in Italy, Belgium and Singapore so that it is able to supply its products quickly and efficiently wherever they are required in the world. Needless to say, with nearly 60 years of experience, the company is also able to offer unrivalled technical advice and support.

Ideal Tape Co., pioneered the use of adhesive coated reinforcement tapes for shoe uppers back in the 1950s and has unparalleled experience in the weaving, adhesive coating and tape cutting technologies needed to produce top quality reinforcement tapes with specific properties to match specific applications. Over the years, Ideal has come to be regarded as a world leader with products that can be totally relied upon.

Among the most significant developments was 'topline tape'. This

clever product combines nylon warp (directional) and bunches of cotton weft (cross) threads. The nylon threads provide high directional strength with a degree of controlled elasticity to produce a strong topline that will still 'give' a little with the foot. The bunching of the cross threads enables the tape to be easily conformed to quite extreme curves without losing directional strength. Ideal offers a variety of topline tapes to suit all types of styles and materials.

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- Lisa Howlett, President

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LUNDER MANUFACTURING

Lunder Manufacturing is a family owned and managed business that has been supplying components to footwear and leathergoods manufacturers for more than fifty years. Founded in 1959 by brothers-in-law Jerome Gillis and Leonard Lunder, the company is now run by Jerome's son Tod. Based in Saco, Maine, in a modern purpose built facility, the company has a reputation for high quality and competitive pricing. It has pursued this policy since the very beginning and it is one that has enabled it to survive and grow in an industry where so many others have fallen by the wayside.

Whereas all the other suppliers covered by this article concentrate on specific products, Lunder offers a wide range of components and specialist services predominantly aimed at boot and shoe uppers. It has a highly skilled workforce that enables it to interpret customer requirements rapidly and to consistently high quality standards and tight delivery schedules. This has won it strong customer loyalty with many leading footwear brands.

Its capabilities include bindings, braiding, pipings, padded collars, tassels and randing, as well as many of the procedures used to produce them such as die-cutting, perforating and edge gimping, cementing and custom folding, slitting and other custom work as well as a design service. All products are made to individual customer specification and nothing is supplied 'off the shelf'. The materials used can be almost any type and colour of leather, synthetic, textile or ribbon, supplied either by the customer or company itself. If a customer is looking for new ideas, there is an experienced research and development department that is usually able to come up with the right answer.

An ability to offer such a wide range of products and services clearly requires more than just skilled operatives and this is where the company also has a major strength: its equipment. Many of the machines needed to perform the various operations that go into making many of these components are extremely specialised and no longer made. Lunder still uses all the machines supplied by the Clark Machine Company from Everett, Massachusetts, when the company started. It says much about their original build quality and the great care that has been taken in maintaining them all these years. The truth is, nothing has been produced since that can better them.

Like the special paint finishes, leather upholstery and other accessories offered by car manufacturers to enhance the base model, so high quality upper components and trimmings can lift an otherwise perfectly practical if not very inspiring shoe into a best seller and greatly add to its retail value and margin of profit. Let's be honest, the look of a shoe is all important to the vast majority of consumers and this is what Lunder aims to respond to.

TEXON INTERNATIONAL GROUP

Mention Texon and the first thing that springs to mind is insoles and, in particular, cellulose insole board. The second is innovation, as Texon has an unrivalled record of being the first to introduce a number of significant new

materials and technologies to the footwear industry. First and foremost of course is cellulose board which caused a revolution in insole manufacture in the late 1940s. In addition, the company was the first to introduce the needle-punched non-woven insole, antistatic insole, an insole incorporating 100% recycled fibres (Texon EcoSole) and fully recyclable toe puff and counter materials (Texon ReForm).

Texon started life 1947 at Russell, Massachusetts, with the aim of finding a better and cheaper alternative to traditional insoles for the footwear industry. The result was a cellulose board with all the advantages of leather but none of the drawbacks. It breathed, absorbed and released perspiration, had the right balance of firmness and flexibility, and provided lasting comfort. It also came in roll form in a variety of substances. Shoemakers loved it as it could be used for almost any construction and offered good performance and uniform quality together with considerable cost savings.

Today, Texon International Group is, as its name implies, a globally focused company with a multi-cultural, multi-linguistic team providing sales and after sales technical services to support its products for footwear manufacturers in the Americas, Greater China, the Pacific Rim, India and across European. Production is now also spread internationally, with needle punched non-woven insoles, Strobel insoles, linings and thermoplastic toe puffs and heel counters produced at Skelton in the UK and cellulose board products at Möckmühl in Germany. The full range of materials is also available from manufacturing facilities in Guandong province, China.

The company has a dedicated product development team working to create innovative solutions for process improvement as well as cutting edge new products. The company's aim as always is to be first to market with new, innovative solutions to make life easier for shoemakers by reducing process costs and production time, increasing productivity while using less energy, generating less waste and managing their impact on the environment.



Lunder's manufacturing capabilities are widespread.

CREDIT LUNDER MANUFACTURING



The RapidTex machine/material system is fast, accurate and zero waste.

CREDIT TEXON INTERNATIONAL

Current innovations include Texon RapidTex technology, which is a zero waste toe puff material that has been engineered to perform to the same level as the company's filmic sheet materials. This machine/material system eliminates the need for cutting, skiving, spotting, stitching and fusing toe puffs as directly printing them onto the upper is the only process needed. Intended for use with leather uppers, independent studies have shown that it can reduce process time by 70–90% depending on the type of footwear.

Another recent development has been Texon Sphere, a zero waste solution for both heel counters and

toe puffs. This sintered product contains up to 40% recycled material and eliminates the need for cutting, skiving and waste removal while giving customised shapes to fit precisely where the reinforcement is needed. While this product is primarily aimed at sports and casual shoes, local sales and technical staff are always available to advise the best product for customers' individual needs. These innovations amply demonstrate Texon's continuing commitment to finding the best solutions to the problems of shoemaking's and there will doubtless be many more to come in the future. ♻️



BK Giulini site, Ludwigshafen.

CREDIT: RHENOFLEX GMBH

Something old, something new

Ask a shoe technician which was the best material to use for heel counters and they would most likely say thermo bonding non-woven. Mention bonded leather and they would probably smile and say it was old technology and not suitable for today's shoemaking. They would be mostly correct in both instances. However, while the vast majority of footwear produced today does indeed use thermo counters, manufacturers of quality ladies dress and men's Goodyear welted shoes both continue to use bonded leather as it offers everything the more traditional shoemaker looks for in a heel counter. Salamander in Germany is a major producer of high quality bonded leather board for a variety of applications including a range of products specifically for use in shoe counters.

Bonded leather is both strong and supple, so the counter will give enough support in the right places while also adapting to the shape of the foot. The foot is a delicate structure, easily

damaged by ill fitting shoes, so the heel needs firm support while some flexibility is desirable around the ankle. It is easy to mould to shape and, unlike synthetic materials which can only be edge skived, it can be skived thick or thin throughout the counter to provide toughness or flexibility wherever it is most needed. It will also take a wide knife edge skive, which prevents shadowing on light weight leathers and, combined with the flexibility this creates, allows the counter to go further forward to add more support to the foot on high heeled styles.

Its very toughness and resilience also means it will retain its shape throughout the life of the shoe. Ladies shoes must retain a clip over the heel to stay on the foot, so retaining this is extremely important. Thermoplastic materials can weaken under heat and prolonged wear so that the shoe begins lose its grip on the foot. And, lastly, because it is made from pure leather fibres and other natural products, it will absorb and transmit moisture to maintain pleasant

conditions inside the shoe. Excess moisture is a primary cause of foot discomfort and accelerated breakdown of the shoe itself.

The counters can be pre-coated with thermoplastic adhesive or with a latex type at the point of insertion during lasting. This to most modern eyes is the major drawback as inserting a fully moulded counter is labour intensive and requires a degree of skill in order to achieve accuracy and avoid wrinkled linings. The majority of footwear manufacturers cannot afford such luxury and so alternatives have been developed over the past 60 years which have now become highly sophisticated.

A REVOLUTION

Rhenoflex, a subsidiary of chemical group BK Giulini in Germany, started to produce heat-activated thermo-adhesive counters in the 1950s. Unlike its competitors, it used woven or non-woven substrates which it sold in sheet form. The big advantage was that it could be cut to shape and skived within



Salamander in Germany is a major supplier of bonded leather for heel counters. CREDIT: SALAMANDER GMBH

the shoe factory rather than being ordered as a complete component. This offered a greater degree of flexibility and economy and set the pattern for counter materials for many years to come.

The next innovation, as far as product was concerned, came in 1980 with the introduction of the patented RX3000 range. This was a major breakthrough in that the adhesive was contained within the material itself rather than being an outer coating. This meant that the skived edges would also stick to the upper and lining, thus improving the bonding area. The material was also easier to handle when hot, as it did not stick to the operator's fingers. The fact that it was made using a powder system with synthetic fillers and polyester fabric meant it was also recyclable and thus environmentally friendly.

The final refinement introduced in the late 1980s was Rhenoprint, which was totally powder-based and, although it still contained fillers taken from post-industrial waste, there was no woven element. It could also be moulded to the required shape with all edge reductions included to eliminate skiving. It also effectively eliminated all waste as everything could be re-ground and re-used as prime raw material. RX5000, introduced in 2005, took this idea a stage further by replacing the synthetic fillers with natural ones and brought the modern counter into line with the 'old' bonded fibre one in terms of environmental compatibility.

Rhenoflex's philosophy has always been to remain one step ahead and the driving force has always been to develop products that customers demand. The latest to come out of the company's R&D laboratories involves materials with comparable performance to existing ones but which are

much lighter in weight. This is in response to sports brands' quest for ever lighter weight shoes. Naturally, counters and toe puffs do not contribute much to a shoe's overall weight but, when it comes down to counting every single gram, it helps to have materials available which are up to 40% lighter.

Although the whole project is still in the development stage, tests have shown positive results. The company is naturally guarded in what it will reveal regarding how these new materials are formulated. Nevertheless, it would appear that a key factor lies in the use of expansion or blowing agents which expand during the production process to closely controlled limits. A special composition of polymers and a great deal of process know-how are required to ensure a homogenous distribution of those agents and a consistent material hardness and density.

Common properties such as resilience and shape retention are said to be excellent. As one can imagine, application is the key to performance, so all parameters have to be fine-tuned to avoid any compression and

deforming while ironing or moulding. Counter materials will be offered coated both sides as previously for ease of application and control in the factory. Rhenoflex says that the big advantage of the new material over conventional perforated ones lies in its stronger structure which means less substance is needed to achieve a given degree of hardness. When perforating a material the loss of resistance must be compensated by increasing the thickness.

So, here we have two totally different counter technologies, one old and one new, but both offering the ultimate in terms of performance in their respective spheres. Forgetting the respective technologies involved, the other big difference is that bonded leather has nowhere further to go as it is now so limited as to where it can be used. This new and as yet unnamed material from Rhenoflex, however, not only has huge potential for sports shoes but will doubtless be used in many other types of footwear in the years to come. Ladies dress and fashion shoes for starters? 



Lightweight sports footwear such as this running shoe by Nike is the initial target for the new Rhenoflex material.

CREDIT: NIKE



CETP plant, Ranipet. ALL IMAGES: WTP

A complete solution

RICHARD DANIELS, TECHNICAL EDITOR, WORLD LEATHER

Water has become an increasingly precious resource in many parts of the world. As a result, large industrial users have come under intense pressure to either change their technologies so as to use less or, if that is not practicable, to recycle as much as possible. Despite the brickbats thrown at the leather industry over the years in regard to its environmental conduct, it is in fact right at the forefront of water recycling.

The Ranipet CETP (common effluent treatment plant) in India is a showcase example of what can be achieved. Commissioned in 1995, the plant originally provided full primary and secondary effluent treatment for 77 tanneries (now approaching 100), followed by discharge of the treated residue into surface waters. Twelve months ago, this policy was revised so that 95% is now returned to the tanneries as pure water for reuse.

Recovered water is currently transported back to the tanneries using a fleet of water tankers. This will shortly

be replaced by a 25 kilometre pipe line that is on the point of completion. The resulting closed water-loop will not only be more efficient but will also avoid problems of water provision or abstraction for a significant number of tanneries in the area, eliminate the discharge of saline treated effluent into surface waters and alleviate local concerns over increasing salinity in groundwater.

THREE STAGE PROCESS

The technology that has been developed to do this is based on a combination of reverse osmosis (RO) and evaporation/condensation. It operates in three stages.

1. The raw wastewater generated by each tannery is subjected to in-house pre-settling and screening before discharge and delivery to the CETP via underground pipelines. On receipt, the effluent is fine screened, settled and equalised. It is then subjected to chemical dosing using aluminium salts, lime and polyelectrolytes to remove any

chrome, suspended solids and part of the organic load. This stage is followed by activated sludge treatment using fine bubble diffusion aerators to degrade organic materials and sulfides. A tertiary treatment then completes this stage by chemically dosing the treated effluent and filtering it through sand.

2. After this sand filtration, the treated effluent is water softened by a lime-soda process using a reactivator clarifier and then further filtered using multigrade filters. This is followed by ultra filtration (UF) in a sequence of hollow fibre membranes for 30 minutes and is then backwashed for one to two minutes. The ultra-filtered effluent is then polished in an organic scavenging unit before desalination in two-stage RO units. At this point in the process, approximately 75% of the effluent has been recovered as high quality permeate from the RO operation and suitable for return to the tanneries for further use. This stage of the operation takes electrical power from the grid for 14 hours of



All treated effluent is returned to tanneries as high quality water.



After tertiary treatment, remaining suspended solids are removed by ultra filtration.



Wood and biomass steam generating plant.



Recovered dry salts await packaging.

the day and from the plant's own generators for the remaining 10.

3. There are many examples of air evaporation of the concentrate following RO treatment of effluents. However, when using this technique, although dry salts are recovered, the water content is lost through evaporation. The CETP process is different in that the remaining 25% of concentrate is force evaporated using a steam generating plant fuelled by 10-12 tons of firewood per day supported by biomass briquettes of dried solids from the activated sludge treatment process as required.

The steam generated is circulated under pressure through steam coils to evaporate the water from the concentrate. This takes place in a seven-stage stainless steel evaporator plant, where the evaporate is recovered as pure water using a condenser unit. This recovered water is added to the permeate from the RO operation for return to the tanneries. Any water losses are due to the normal surface evaporation associated with effluent

treatment; no liquids are discharged from the site.

The salt-laden solid residue from the evaporation plant comprising mainly sodium chloride, sulphate and persistent organic compounds is finally recovered via a centrifuge and stored in polypropylene bags. A huge storage facility is under construction to hold this salt long term while uses, such as hide and skin preservation, are investigated.

GLOBAL FIRST

Although this is the first plant in the world to operate in this manner, the technology used can be applied anywhere. While it totally solves the problem of saline discharges into surface waters and rivers for inland tannery clusters, it is expensive both in terms of capital, operational costs and energy consumption. The cost of conventional treatment at the plant (primary, secondary and conventional tertiary) was Rs 30-40 (\$0.6-0.75) per cubic metre; it has now risen to Rs 140-160 (\$2.6-3.0).

Nevertheless, the CETP plant is

paving the way forward by saving abstracted groundwater to the extent of 3,000 cubic metres per day and has eliminated the risks of contamination of both surface waters and the aquifers through salinity. It has also ensured the future viability of tanneries in the Ranipet cluster and the livelihood of some 15,000 direct employees. Funding for the project was provided by a 50% grant-in-aid from the Department of Industrial Promotion and Policy, Government of India, 15% from the Ministry of Industry and Commerce, Department of Industry, Government of Tamilnadu and 35% by the CETP (i.e. the tanners themselves). Total cost was Rs 440 million or approximately \$8 million in dollar terms.

This can truly be regarded as a 'world first' where a combination of clean technology on behalf of the tanners and considerable investment backed by both regional and central government has created an efficient water/tanning/effluent closed loop that is a benchmark in water recycling for the leather industry. 🌱

Traditional shoe lasts were made from wood.



Footwear Fundamentals

Lasts

The earliest footwear in cold climates consisted of wrapping the foot in a piece of animal hide and securing it around the ankle, a concept that has survived as the moccasin. In hot climates, people either went barefoot or had simple sandals. Neither types of footwear required lasts. As constructions became complex a carved wooden shape or last came into use on which the upper and sole could be shaped and stitched together to form a finished shoe. These were however made as straights and not lefts and rights, so new shoes had to be 'broken in'.

In the late 1820s, a duplicating lathe for the manufacture of gun stocks was invented in the US and it was quickly realised that the guiding cam that followed the outline of the pattern model could be reversed and that this would enable left and right foot shoe lasts to be turned at the same time. Nevertheless, this did not have any real impact on shoemaking until mass production began in the latter part of the century calling for large quantities of lasts made as matching pairs and in accurately graded size intervals.

LAST TURNING MACHINES

Last turning machines need an original last to copy and this was made by a master model maker. After it was approved, additional wooden models per width had to be made for fit trials and special ones for production. These had the sharp edge or 'featherline' of the last bottom reinforced by metal tacks driven into the lasts and filed to shape. This was necessary as the machines not only duplicated the original size but also graded up and down a few sizes. The model was 'traced' by a copy wheel and the pressure this exerted on the last would quickly damage the sharp definition of the featherline.

The second reason for all these models was that the lathe could only grade two or three sizes away from the model size before there was significant distortion. Accommodation models were therefore made two or three sizes apart which would be reshaped by hand to conform to industry standards and the aesthetic qualities of the original model. Making and 'tacking' each model would often require as much

time and effort as the original master.

A tough and close grained wood was essential to make a smooth finish possible and to prevent cracking and splitting during the shoemaking process. Maple wood was favoured in North America and beech in Europe. Although up to two pairs of lasts could be turned at the same time on each machine, some 60% of the work needed to produce a pair of lasts was performed manually. This included finishing the toe and heel as these could not be machined because it was at these two points that the rough-cut blank was held in the lathe while being turned to shape.

Model makers were very highly skilled and it took several years for an apprentice to achieve the degree of competence needed to interpret a design and produce an accurate model quickly. Few now remain as many lasts are created using 3D software programs that avoid the need for a hard model as the design is transferred directly into grading software and from there to the CAD program controlling the actual machining of the last.

COMPU-LAST

In the 1980s, American last maker Jones & Vining came up with a revolutionary idea that eliminated this expensive and time consuming tacking. This involved digitising the master model and then digitally grading all other sizes from that data. No tacking or accommodation models were needed and there would be no distortion.

Compu-Last, as the new system was called, became the first commercially successful CNC last lathe system in the world. It allowed model makers to focus on the master models and, at the same time, opened the door for transferring this data around the world so that a model could be made on one continent and lasts quickly produced on another.

It was also the catalyst for the development of other systems that followed from companies such as Newlast, TRL and Palser. These CAM systems were also pivotal in accelerating the development of 3D CAD systems for making lasts. Now there were machines that could produce 3D last data productively in a factory and last making would never be the same again.

ACCURACY

Are these lasts as accurate as those produced by mechanical lathes copying wooden models or, perhaps, even more accurate? The answer depends on just how accurate you think a last should be. With the old system, no matter how accurate the original model, there were numerous opportunities for some or all of the sizes to deviate from it. With CNC lathes the digitised data of the original model can be reproduced as long as required. Whereas a wooden model can swell, shrink or be altered during the tacking process, a digital file never changes. Furthermore, if the machines are calibrated regularly and correctly, it really doesn't matter what type of CNC lathe is used as the results will be the same.

It must be realised however, that there is no such thing as an exact or perfect last. No matter how highly calibrated a machine might be, there is always a plus and minus tolerance factor, however small. But, what is a variance of a fraction of a millimeter compared to what could happen using a cloth or plastic last measuring tape marked in



A long apprenticeship was necessary to acquire the skills needed to become a last model maker. CREDIT: FAGUS

single millimeters or sixteenths of an inch? When it comes to sizing, no matter whether the model data is graded on the software that comes with a particular CNC lathe system or on a 3D CAD system and then sent to a lathe, the results are remarkably similar and certainly closer than could ever be detected with a last tape.

It is an acknowledged fact that, until the advent of digital lasts, the methods used to measure them were both crude and inconsistent, although the results were acceptable if not verifiable. Digital data is not subject to the physical changes that wooden models go through over time. All measurement points can be precisely located and transferred proportionally to the exact

same spots in other sizes. Lasts produced on digital systems should therefore be extremely consistent in size grading throughout the range. In fact they are and, in addition, the look and proportions of girth measurements throughout the size range and the fit achieved in the original model are not lost in extreme sizes.

A further factor in maintaining accuracy lies in the material used to produce the lasts themselves. Whereas they were once made of wood, they are now turned from moulded polypropylene blanks. No matter how dense the wood used, it would always be subject to a degree of expansion or contraction due to changes in temperature and humidity. Polypropy-



Polypropylene last made using the Compu-Last system. CREDIT: JONES & VINING



The Newlast NLS 1 milling machine holds the moulded blank at the top instead of at the toe and seat, then roughs and fine turns it in one sequence to produce a highly accurate finished last. CREDIT: NEWLAST GROUP

lene is not only totally homogeneous as a material but is also impervious to such atmospheric conditions.

FINER TOLERANCES

The demand for precise last accuracy, particularly in the direct soling field, has increased enormously in recent years. Minimal tolerances of around 0.2 mm are required for moulds and lasts to ensure no material is exuded during the injection of soling compounds and that the uppers are not pinched off. The latest generation of last making machines use special holding systems that allow the entire surface of the last to be milled including both toe and heel. Where even with the most skilled operators, 'toeing and heeling' could never be perfectly accurate or consistent, the new milling machines can produce lasts that are so precise that they can even be used for direct injection soling using low viscosity PU without the risk of flash.

OWN DESIGN

There is now only a handful of last manufacturers in the world with the capacity to design new lasts and modify existing ones in order to produce new

ranges. As a result, software programs such as Delcam's LastMaker 2010 have appeared that enable shoe manufacturers to create their own-design lasts. The process involves editing key areas of an existing digital last such as standard last length (SLL), heel to ball, arch, ball joint, instep, heel, entrance axis, cone and toe to be changed. Further adjustments can then be made to cross sections through the width of the last in order to adjust the inside and/or outside upper/bottom girth, width and circumference. The final shape is achieved by bringing together individual profile lines at all the key points and blending them all together to produce the new last.

At one time, lasts were often modified by physically splicing a replacement toe section into an existing last as a cheap way to make a new shape. LastMaker can do exactly the same thing so, if a factory has a well proven last and the heel height remains the same, seasonal styling changes can be met merely by blending in a new toe profile. Similarly, a shoe last can be converted into a boot last by changing the position of the ankle control plane between the cone and back curve lines to produce the

basic shape profile to the leg which can then be added in sections according to final height and width required a far cry indeed from the hours needed to create a solid model by hand.

The demands on last design nevertheless remain extremely high as it must also take into account the fact that every person's foot has varying shapes and sizes. If you think this contradictory, consider the following ways in which the foot can become different in shape and size depending on circumstance:

- In a high heeled shoe compared to a low one
- In the morning to the evening
- When weight-bearing than at rest
- When walking, running or jumping
- In illness than in health
- Summer and winter

Producing lasts on which to make shoes that can encompass such variations as this is demanding in the extreme. It is no wonder that last making has always been one of the most skilled aspects of footwear manufacture and, despite the sophistication of the technology now used, is likely to remain so into the foreseeable future. 📌

THE FAST WAY TO THE TOP REQUIRES PERFECT GRIP

Adaptability and diversification are natural preconditions of success. In accordance with this law, Rhenoflex supplies components to the most important shoe manufacturers in the world. Our strong position is based on being part of a prospering global holding and on our own expertise: Researchers at our in-house laboratories constantly develop new technologies and innovative materials. Therefore, we can provide solutions perfectly customized to your branch.

Be faster than your competitors and grab the phone now!

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New technology for capturing 3D images of consumers' feet can help footwear companies deliver the right size first time, cutting down on the expense and inconvenience of returns from dissatisfied customers.

A solution to size confusion for online shoe shoppers

Swiss technology provider Unique Trend Developments (UTD) has developed a new online personal assistant to help consumers choose the right size when shopping for shoes on the internet.

Because of discrepancies between brands on shoe sizes, online shoppers have traditionally had few reassurances until now that the stated size for a particular model will be right for them. As a result, UTD has said, some footwear retailers and brands are experiencing return rates of up to 40% for shoes sold online. It says sizing problems are often "an obstacle that can discourage purchases".

UTD's Right Shoes works by giving consumers the chance to carry out their own 3D foot scan. The technology provider describes the result as "an identity card for your feet". Scanners will be available in select shoe retail outlets and, in the coming months, through a new smartphone app. The system will then be able to make an automatic comparison between the consumer's foot scan and stored data of the last used for each model and each size by participating manufacturers. When the smartphone app is in operation (successful trials have already taken place), users will be able to snap an image of their own feet using their handsets and receive a 3D image of their feet from Right Shoes.

When customers submit this data and specify the brand and styles they are interested in buying, the system shows graphically which size each particular model will provide the best fit for each wearer. Colour-coded diagrams show where on the foot there is likely to be too little or too much room with a particular size, helping consumers make a decision about whether to go a size up or a size down.

It doesn't have to be this way. Right Shoes scanning can help consumers and brands get sizes spot-on.

CREDIT: SHUTTERSTOCK/FALATER PHOTOGRAPHY





Traditional Italian brands including Sperranzoni have been among the pioneers of the new technology. They want to increase customer loyalty and save on the logistics costs involved in returning shoes of the wrong size. CREDIT: SPERNANZONI

In the meantime, roll-out of the hardware, developed with Italian last technology provider Newlast, continues. After an initial presentation at the Micam exhibition in Milan in September 2012, a prototype of the scanning technology went on show at a conference on body-scanning in Lugano, Switzerland, in October. Within a few months, the first scanner was in place, in a high-end footwear store in Milan, the one that Il Gergo runs in Via Unione. More locations have followed this lead, including one run by high-end Italian footwear group Vittorio Sperranzoni (to which Il Gergo belongs) in Moscow, as well as in a second Il Gergo location, its outlet store in the outlet village at Il Castagno, near Civitanova in Le Marche, the most prominent footwear-manufacturing region in Italy and the company's home region.

The Sperranzoni and Il Gergo names are synonymous with high quality. The shoes are handmade and prices, for the men's collection, start at €240 per pair. Traditional skills and values are at the heart of what the company does, but, according to Elisabetta Conti, who handles communications and marketing for Right Shoes, it's no surprise that it should have stepped forward as a pioneer for her company's foot-scanning technology.

Ms Conti explains that figure of 40% for return rates comes from multi-brand online retailers, but she insists that it is indicative of a more widespread problem. All footwear brands want to get sizing right, in the sense of customers being able to pick out shoes that will fit well, because it leads to increased customer satisfaction and lower logistics costs, including the reverse logistics costs of having to handle all the returns. Online customers who are unsure often order the same shoe in two different sizes, to decide only after trying them on, just as they

would in a store. If it's free to send back what proves to be the wrong size, the consumer doesn't mind. But, of course, it isn't really free and someone has to pay for the shipment. To use digital data to match feet to shoe sizes more accurately will, clearly, be of great help.

However, there are other aspects. Footwear companies have to share data on lasts, sizing and styles with Right Shoes so that the technology provider can make an accurate match between foot and footwear. The shoe manufacturers that do this are added to a brand database that Right Shoes is running. This requires a degree of faith in the technology and in UTD. Il Gergo is not alone in already having taken the plunge. Brenta-based brands Nic Dean and Bellò have also signed up, as has Padua-based women's brand Nouchka and Le Marche-based golf shoe brand Morris.

There are two benefits to the brand. The first is that increased consumer confidence in the right fit will inspire increased brand loyalty. Less obviously, Ms Conti explains, the footwear brands have told UTD that they believe Right Shoes can help them combat unfair competition from counterfeiters, who use internet shopping platforms to pass off imitations as genuine, handmade Italian shoes.

Online shoe shopping is here to stay, as internet-only retailers Zappos, Zalando, Asos and Spartoo are making clear. France-based Spartoo said at the end of last year that it had secured €25 million in new funding to help it sustain growth and expansion. Its turnover increased 20-fold in the years between 2009 and 2012 and it now stocks 30,000 models from 700 footwear brands and has 12 million unique visitors per month.

In response, many brands with important retail businesses of their own have stepped up their online sales presence as complements to their bricks-and-mortar stores. Right Shoes appears to be a technology that can help buyers and sellers everywhere. 🌀



Brands including Bellò and Nic Dean have found that pointing online customers towards Right Shoe for sizing will help them stave off competition from counterfeiters. CREDIT: MICAM



Cocorose founder Janan Leo uses fish leather to add texture

PHOTO CREDIT: COCOROSE LONDON

Swimming with the tide

An alarming amount of fish skin finds its way back into the oceans or into landfill, discarded by fish factories and the fishing industry, but footwear designers are among those trying to put the by-product to use. Studies have shown that filleting produces about 67% of waste, which is polluting due to the high amount of organic material. However, its skin was until a decade or so ago seen as a hard product to work with – the tanning process was specialised and the material it produced often too hard. But advances in processing, not least brought about by a project spearheaded by Spanish footwear association Inescop, have resulted in a strong and supple material that adds texture and quality to footwear – the task seems now to be convincing the public of its appeal.

"I love the texture of fish skin and the leather absorbs colour in such a wonderful way," says Janan Leo, founder of footwear

Footwear brands are shunning regular materials and turning to salmon, cod and other fish to add texture and strength to their designs.

brand Cocorose London. "I also love the juxtaposition of how it looks so fragile and delicate but is in fact a robust and durable material to use."

The London-based designer has grown her ballet pump business from around 500 pairs per year four years ago to supplying 25,000 per year to retailers across the globe. She chose fish leather from China for her latest collection: "The skin added that extra bit of interest to what could have potentially been a rather classic ballerina."

Alternative exotic

One of the largest suppliers of fish leather is Atlantic Leather, a specialist tannery located in northern Iceland, and a recent exhibitor at Le Cuir à Paris. Its proximity to the oceans and domestic fish farms gives it a steady supply of product: salmon from local rivers or farms, cod and wolffish caught off the country's coast, and it imports Nile perch from Kenya, Tanzania and Uganda. "Demand has been increasing – people find it interesting, and they also like the idea of sustainability," says Gunnstein Bjorrsson, Atlantic's CEO. The tannery has seen output jump from 15,000 square feet of leather in 2003 to 106,000 square feet in 2010 and it counts the world's biggest fashion houses, including Dior, Gucci, Prada and Salvatore Ferragamo, among its clients.

UK-based footwear brand Mors is also a client. Jonathan Morss, the head designer and founder of the company, says fish leathers offer a tactile quality that is difficult to replicate with other materials. "Fish skin has some amazing colours and textures to it," he says. "You can see the scales and it has a great feel. It's also an exceptionally strong leather, while looking delicate."

He created a high-top sneaker from electric blue and black/blue salmon leather and a low-top from dark blue salmon, as well as a design in the local wolffish, using its natural colours. "Wolffish has natural spots and looks really interesting for a statement piece," he says. "Salmon has probably the best combination of interesting textures and wearability – it can be used as a replacement for reptile skin."

And that is where most designers are pitching fish leather: as an alternative to snake and crocodile. At around two skins per pair for Mors' styles, it is not a mass-market option – the client pays more for quality, and the shoes are handcrafted in Portugal or the UK. "It's an expensive process and as such the end result has a high price, so it's not really for the mainstream market at the moment," adds Mr Morss.

Environmental gains

Different skins offer different qualities but all go through the same basic tanning process, which takes about a week. The skins are dyed, stretched and dried, softened, and prepared for the final finish. Fish leather is stronger than most other leathers and has more resistance to folding and creasing. The carbon

footprint is also lower: it requires fewer chemicals in the tanning process and produces less waste.

"Our tanning and coloration processes require abundant hot water, which means such production would generally be considered energy-intensive and even harmful to the environment," adds Mr Bjorrsson. "However, we use only geothermal hot water, which is an efficient, environmentally friendly and renewable resource. In addition, all electricity comes from a hydroelectric power station."

The eco story is a strong pull for designers and could, in future, be one of the key selling points to consumers. High-end shoe designer Manolo Blahnik created a tilapia skin shoe in 2011 as part of an 'eco range'. Tilapia is a freshwater fish that originates from Africa and the eastern Mediterranean but which is considered one of the world's most invasive alien species because of its ability to displace native species and restructure aquatic ecosystems. However, it is also a valuable source of protein, which is why it was aggressively introduced across the globe. If these communities could also make use of the skin, the value to them would increase substantially.

Brazilian apparel brand Osklen produced a tilapia shoe collection, as well as a range featuring salmon and pirauçu, one of the largest freshwater fish in the world. Its domestic counterpart Green Obsession has also built a network of raw materials suppliers, tanners and artisans to make footwear and bags from tambaqui and tucunaré. Using the larger fish skins is something tanners, designers and the food industry have been looking at seriously for a few years. In South America, pirauçu and other species of river fish are significantly larger than their European counterparts – potentially offering more leather, thus more shoes per skin.

New skills

The authorities in the province of Chubut, in the south of Argentina, have recently set up a series of workshops to help people in fishing communities learn to make leather from the skins. One of the organisers, Fabián García, explained to local

Mors salmon leather high-tops are hand-made in Portugal.

PHOTO CREDIT: MORS



THE POWER OF THE WEB: BIOCUSTOMISED FOOTWEAR?

Colourful options for stingray designs.

CREDIT: NEXT NATURE NETWORK



HOOKED ONLINE

Towards the end of last year, around 10,000 customers took the opportunity to design a pair of stingray sneakers with their choice of colours and pattern. They used an online tool, which matched the pattern to the correct genetic coding. Scientists in a lab in Thailand would implant the coding into stingray embryos and 'grow them' in large tanks. When fully matured, the stingrays would be harvested and used to create a highly customised pair of sneakers. At \$1,800 they would not be cheap. And with the limitations of modern science, not possible either.

The elaborate hoax took place over two years, with a team of animators, writers, programmers and designers working on the construction of the fictional company, Rayfish. They built a corporate website, sent out press releases and uploaded video footage, and hired an actor as the CEO. "The end of mass production is over – we've entered the era of biocustomised products, which means that customers can grow them according to their own desires," he told audiences via an online 'seminar'.

Jan Jansen, a Dutch shoe designer, made some stingray shoes for the footage with skins supplied by Royce Exotic Leather. "The material is

actually beautiful," he says. "There are details on the back of the skin that you can use for the funnel on the shoe." Global media ran with the story and customers signed up.

Next, a video appeared on YouTube of 'animal rights activists' allegedly breaking into the Rayfish lab, stealing the stock and then setting them free. A month later, more footage appeared showing strangely patterned stingray – the genetically modified creatures were said to have mated with wild stingrays. Only then did the company come clean. Koert van Mensvoort, director of Netherlands-based Next Nature Network, said: "We were fascinated with the relationship we have with animals – on one hand animals we keep as pets and on the other, animals in industry for food and leather production." They used it as a complex social experiment and were funded by media organisations such as the Dutch Film Fund.

However, while the story was false the premise wasn't totally absurd. Randy Lewis, a Utah state biologist contacted by some sceptical journalists, said: "I know the main people in that field so I know it is not possible in this stage in the game. But I certainly wouldn't bet against that sort of possibility in the future."

media that the authorities have high hopes of being able to make use of a material to which Chubut has substantial access.

"What we want is to be able to make something of the waste products from our local fish processing plants. We are very interested, for instance, in seeing if we can make leather from hake skin. We hope to set up a whole value chain from this. Huge quantities of the material are being thrown away every day, and this is causing us quite a serious waste management problem."

Similarly, researchers from the National Institute of Industrial Technology (INTI) of Chubut have been working with the institutes' leather centre on tanning perch, rainbow

trout and Patagonian silver smelt in a project funded by Department of Fisheries of Chubut. "The perception of the 'novel status', the texture, the applicability of dyes and the potential introduction of blends provide the appeal," says a spokesperson from INTI.

With ongoing research and a more plentiful supply of tanned skins, prices should come down as designers more readily incorporate fish leather into their collections. "A well-known bag designer showed me a salmon skin bag she'd had as her everyday bag for 10 years and it looked almost new," says Mr Morss. If consumers can eventually be convinced of this combination of luxury and durability, a freely available by-product will find a new lease of life. ♻️

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