

WORLD FOOTWEAR

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FOR THE GLOBAL SHOE INDUSTRY

Circular-economy principles

A footwear year in review

Puma and adidas at odds again

Shoes in the ISPO spotlight





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McKay boots in veg-tanned leather from the latest fashion collection from designer Jan-Jan Van Essche. He sources the boots from Tokyo-based Petrosolaum, a footwear partner that is committed to circular-economy principles.

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Global news

UK Co-founder of UK-based goat leather manufacturer Billy Tannery, Jack Millington, has described a new project to supply upper material to a famous Northamptonshire footwear brand as a dream come true. Rushden shoe and boot manufacturer Grenson has used chestnut brown goat leather from Billy Tannery in a new, limited-edition, Goodyear-welted, Derby-style work boot.

France Saint-Malo-based fashion group Beaumanoir, the parent company of Cache Cache, Bréal, Carroll, Morgan and other brands, has been successful in its attempt to acquire the Sarenza fashion and footwear e-commerce platform. Group chief executive Jérôme Drianno said the acquisition was the culmination of investment in omni-channel and digital business, which he said Beaumanoir had embarked on a number of years ago.

Spain A small Madrid-based footwear brand that opened its first store just before covid-19 has started 2023 on a new footing. Diplomatic launched in 2016 as a formal men's shoe brand. It has since added more casual styles and women's collections to its output. It withstood the covid-19 setback and opened a second store in 2022. Founder, Rodrigo Fernández, has confirmed that Diplomatic recently secured investment capital of €500,000 and was intent on using the new funding to grow. It plans to open a third store in March and to open stores in Barcelona and a number of smaller cities in Spain before the end of the year. It aims to open its first overseas store in 2024.

Germany Polymer manufacturer Covestro has released preliminary full-year sales figures of just under €18 billion for 2022. It will confirm the figures in early March when it releases its annual report for last year. This figure would represent growth of 13.2%. Chief executive Dr Markus Steilemann said business development last year had been impacted by the sharp rise in energy and raw material costs, high inflation and a weakening global economy. He added: "Nevertheless, our products are part of the solution to the current crisis and essential for a sustainable and circular future."

Colombia Besides the challenges of inflation and the rising cost of raw materials, one of the main problems confronting Colombia's footwear industry is the ongoing shortage of qualified personnel. According to William Parrado, director of economic research at industry body ACICAM, manufacturing jobs are unattractive to younger people. In December, the Colombian government increased the national minimum wage to around \$240 per month. Sector estimates indicate that the footwear industry has 83,000 workers in the country.

Venezuela Venezuela's footwear manufacturers have said a renewal of trade flows with Colombia after years of restrictions threatens their potential for recovery. One of the most important trade routes between the two countries, connecting Cúcuta in Colombia and the Venezuelan state of Táchira, reopened towards the end of 2022. Footwear from Colombia is more competitively priced than shoes made in Venezuela, owing to production efficiencies.

Egypt Twenty-six leather industry bodies signed an updated version of the manifesto that the industry published in October 2021 to coincide with the United Nations Climate Change Conference. The most recent conference, COP27, took place in Sharm El Sheikh, last November. In the updated text, the signatories renewed their call for recognition of the "vital role" that natural materials, including leather, play in addressing the challenges of climate change.

Hong Kong Footwear group Stella International has reported unaudited consolidated revenue for 2022 of more than \$1.6 billion, an increase of 5.9% year on year. However, in the final quarter of 2022 revenue dipped by approximately 15.4% compared to same quarter in 2021. Stella said it was likely to continue to face headwinds this year including uncertainties in the macroeconomic and geopolitical situation, economic slowdowns in the US and Europe, increasing covid-19 infections in China, and some customers adopting a more cautious approach to business.

South Korea Doors opened at adidas' first Home of Sport store in Asia-Pacific, located in Seoul's Myeong-dong shopping district, in mid January. The two-story space has a total floor area of 2,501 square-metres, making it the sports company's largest retail destination in South Korea. Built as a special brand flagship, the store will be home to all adidas brands, including Performance, Terrex, Originals and Y-3.

Brazil Footwear industry body Abicalçados has said 64 Brazilian shoe brands will be exhibiting at the forthcoming edition of Micam in Milan. The event runs from February 19 to 22. Abicalçados analyst Paola Pontin said Micam would present Brazil's footwear sector with a good opportunity to build on a strong export performance in 2022. Last year, brands the country exported 141.9 million pairs of shoes with a value of \$1.3 billion, which represented the best figures in 12 years.



Pakistan In the first six months of the current fiscal year (July-December 2022), Pakistan's leather exports fell by 15.5% compared to the same period a year earlier, reaching \$412.7 million. The bright spot was footwear; exports of all types grew by 49.3% in volume and by 26.1% in value with 12.2 million pairs exported, bringing in export revenues of \$977 million. Other categories of leather exports did not perform as well according to the Pakistan Bureau of Statistics.

Vietnam Open-cell foam technology developer OrthoLite has named Juan Cutina as the new sales director for its Cirql initiative. Based in Ho Chi Minh City, OrthoLite Cirql is a division of the company that produces the world's first EVA plastics-free, recyclable, biodegradable and industrially compostable foam, which the group describes as "enabling true circularity for footwear brands and factories". Mr Cutina has more than a decade of experience in footwear manufacturing in Vietnam.

Argentina Puma has opened a new 1,000 square-metre store in Martinez, a town in the province of Buenos Aires. The new store is Puma's largest in Latin America. It said that this opening is part of the company's wider plans for expansion in the Argentinean market. Puma owns a factory in the province of La Rioja that supplies its retail outlets in the country with 80% of their inventory. Currently, the factory produces 2.6 million pairs of shoes per year and plans are afoot to expand production to 5 million pairs annually by 2025.

Indonesia A wholly-owned subsidiary of Taiwanese shoe manufacturer Yuqi International, which produces outdoor footwear for customers such as Under Armour, Decathlon and The North Face, has secured fresh funding for the construction of a new Indonesian shoe factory. The Yuqi subsidiary will be able to invest \$83 million in establishing a production base in the province of West Java, which shares part of its western border with Indonesia's capital region, Jakarta.

Bangladesh Footwear materials developer Texon took part in the Leathertech 2022 exhibition in Bangladesh in December. Texon said it wanted to use its presence to showcase to footwear manufacturers components it has recently re-engineered to include more bio-based and recycled content. Visitors were also able to learn about new woven and cellulose products that Texon has developed to help improve the design, performance and environmental credentials of footwear.



Footprints

Gucci announces new creative director



CREDIT: RICCARDO RASPA

Luxury brand Gucci has appointed **Sabato De Sarno** as its new creative director. The company said he would assume responsibility "for defining and expressing the house's creative vision" across its women's, men's, leathersgoods, accessories and lifestyle collections.

Sabato De Sarno began his career at Prada in 2005, moving to Dolce & Gabbana, before joining Valentino in 2009, where he held positions of increasing responsibility, finally being appointed fashion director overseeing both men's and women's collections.

Gucci chief executive, **Marco Bizzarri**, said the role of creative

director at Gucci was "one of the most influential roles in the luxury industry". He said Mr Sabato De Sarno had a deep understanding and appreciation for Gucci's legacy and would lead the brand's creative teams "with a distinctive vision that will help write this exciting next chapter".

Chief executive of parent group, Kering, **François-Henri Pinault**, said: "Gucci remains one of the most iconic, prominent and influential luxury houses in the world 102 years after Guccio Gucci opened his first store in Florence. With Sabato De Sarno at the creative helm, we are confident that the house will continue to influence fashion and culture through highly desirable products and collections, and to bring a singular and contemporary perspective to modern luxury." ■

Celebrated fashion designer dies

Fashion designer **Paco Rabanne** died on February 3, two weeks short of his 89th birthday.

Paco Rabanne lived most of his life in France but was born near San Sebastián. He had a strong connection to the Basque city's other famous designer, **Cristóbal Balenciaga**, with whom Paco Rabanne's mother worked for many years as a dressmaker.

On moving to Paris in the 1950s, Paco Rabanne studied architecture but partly funded his studies by designing shoes. He began to produce full fashion collections of his own in 1966 and retired in 1999. ■

Tributes as Desma distributor retires

Footwear technology provider Desma has paid tribute to **Michihiko Yoshiike** for acting as the German company's exclusive distributor in Japan for more than 55 years. Mr Yoshiike stepped down from the role on January 21.

Mr Yoshiike studied applied chemistry and, in 1967, began using his knowledge of materials and processes to help Desma build up its presence in the Japanese footwear market. The company paid tribute to his commitment and enthusiasm and said his name had become a by-word for dependability at corporate headquarters in Achim.

The company has a new distribution partner in Japan, Illies & Company, which has offices in Tokyo and Osaka. ■

Chief sustainability officer appointment at PrimeAsia

Leather manufacturing group PrimeAsia has completed its search for a new chief sustainability officer and has appointed **Camille Mori** to take over the role. She will join the company this February.

She joins PrimeAsia from the Phillips-Van Heusen Corporation (PVH) where she had roles in sustainability and corporate social responsibility. Among her educational qualifications is a Master's degree in social impact and sustainability.

At PrimeAsia, she will lead a team dedicated to highlighting the sustainability of the company's products and manufacturing operations and will report directly to chief executive, **Jon Clark**. ■

Chief executive Rendle leaves VF Corporation

Clothing and footwear group VF Corporation has announced that its chief executive, **Steve Rendle**, has decided to retire from his position with immediate effect.

Benno Dorer, an independent director on the group's board, will be interim chief executive. VF said its search for a new, permanent chief executive had already begun.

For his part, Mr Rendle said it had been an honour to lead VF, whose brands include Timberland and Vans, for the last five years. He said he remained "as confident as ever in VF's tremendous potential". ■

Life after Caleres for Carlos Santana brand

Guitarist and songwriter **Carlos Santana** is back in the shoe business. The nine-times Grammy award winner has taken back control of his Carlos By Carlos Santana shoe brand from footwear group Caleres and launched a new collection at the end of 2022.

He launched the brand in 2001, working with Caleres (formerly Brown Shoe). Caleres retained its licence for the brand until 2019. ■

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Industry & Innovation



All-new adidas Sportswear label unveiled

After previewing its first new sub-brand to reach the market in half a century in February, sports group adidas has now launched its adidas Sportswear label and collection, with the campaign's tagline of 'All That You Are'.

The line uses "the latest performance technology" to add another layer of "comfort-first" assurance to everyday wardrobes, said its senior designer, Jasmin Bynoe, who also described how simple cuts, minimal design details and intentional colourways had been selected to deliberately make the collection something of a "blank canvas". Debut styles include the Avryn shoe, which adidas says is partly recycled and the result of a new way of combining its Boost and Bounce footwear technologies, plus the Tiro Suit, a reimagined take on the company's heritage tracksuit model, first released in 1967 as its first piece of athletic clothing. A relaxed-fit jersey inspired by 1990s football aesthetics, a wrap-like dress that can be worn as an added tie-front layer and a sporty, oversized Coach jacket round out the initial line-up.

Actress and producer Jenna Ortega, the face of adidas Sportswear, commented: "I am a huge advocate of expressing all your different pursuits, passions and traits, which is why I was so excited to work with adidas on this new label." ■

German tannery secures Oeko-Tex STeP

German leather manufacturer Heinen has become the first tanner in the country to secure STeP certification from standards body Oeko-Tex.

STeP originally stood for 'Sustainable Textile Production'. Oeko-Tex introduced this certification programme in 2013 to replace its old Standard 1000. It said at the time that its aim was to recognise companies that run environmentally friendly and socially responsible supply chains. It began applying STeP to leather in 2019.

Heinen has long embodied the principles that underpin STeP. Terracare, the brand name that Heinen applies to all its finished leather, is well known among sustainability-focused high-end brands.

According to Heinen, the name Terracare defines its production standards: environmentally-friendly, resource-efficient and socially compatible, using raw materials from Germany. ■

Orthopaedic insoles can benefit from Elastollan, BASF says

Materials developer BASF has said its Elastollan thermoplastic polyurethane (TPU) can work particularly well in orthopaedic insoles.

It said the material demonstrates a high level of vibration damping and resilience and inserts made from it will retain their properties even in fluctuating temperatures.

In orthopaedic insoles, it said the material can support the entire skeleton. And in sports shoes it can provide special load cushioning and support. ■

Online shop will make Ecco Leather stock available to all

Ecco Leather has launched a new initiative to attract the public and emerging designers to leather and to help prevent its materials from going to waste.

It has opened EL3 Vault, which it has described as an online "stock shop" that is open for anyone who wants to buy small quantities of leather from its collections. ■

Update on manmade cellulosic fibres

The Zero Discharge of Hazardous Chemicals (ZDHC) programme released an updated version of its guidelines for producing manmade cellulosic fibres (MMCF) at the start of January.

ZDHC said this update, version 2.0 of the guidelines, would help "push the industry towards increasingly innovative and sustainable fibre production". The new version includes specific chapters on the responsible production of fibres, wastewater treatment and air emissions control. ■

Zipper manufacturer Riri acquired

Swiss textile machinery manufacturer Oerlikon has reached a definitive agreement to acquire Riri, a provider of coated metal accessories including zips, buttons and rivets for footwear, clothing, bags and other products. ■

Innovation centre will speed up product development, Mizuno says

Sports group Mizuno's new innovation centre, Mizuno Engine, is open for business, three years after the company announced the project.

Located at the company's headquarters in Osaka, the 6,500 square-metre facility offers a designated space for manufacturing and testing product prototypes. It features dedicated spaces for sewing, painting, 3D design, environmental testing, impact testing, a gymnasium, a track, artificial turf, and other spaces for product development.

By developing a wide variety of products such as footwear, apparel, and equipment simultaneously in a single facility, Mizuno expects to integrate new technologies into its products more quickly. What it called the trial-and-error cycle, such as sample prototyping and verification, can be performed in a shorter time which will lead to faster research and development. ■

Software to help shoe firms on show at Micam

Italy's national footwear manufacturers' association, Assocalzaturifici, is presenting a new software tool called VCS at the Micam exhibition in Milan from February 19-22.

It developed VCS in partnership with Milan-based consultancy Spin 360. The two organisations have said the software can help footwear manufacturers demonstrate supply chain responsibility and sustainability.

In the build-up to Micam, Assocal said the tool would help shoe manufacturers identify and address areas of risk and reduce the impact these might have on a business.

It pointed out that, with compulsory reporting by companies of their corporate sustainability performance likely to come into force in the European Union by 2025, with an obligation to report information from the previous year's activity, companies active in the European market will have to take action sooner rather than later. "VCS software will help companies tackle this," Assocal said. ■

Bio-responsive material powers energy-return in UA shoes

Sports brand Under Armour has used Celliant to endow the lining in its Hovr Machina 2 SE women's running shoes with energy-return functionality.

Celliant uses a blend of bioceramic minerals embedded into textiles to convert body heat into infrared energy, returning the energy to the wearer's body. This, in turn, helps improve circulation and cellular oxygenation.

Using the material in shoes will also help improve endurance and keep the wearer's feet at a comfortable temperature. ■

Pledge from 3M to exit PFAS production by 2025

Performance materials developer 3M has announced that it will stop producing per- and polyfluoroalkyl substances (PFAS) and work to discontinue the use of PFAS across its product portfolio by the end of 2025. It said its decision was based on "careful consideration and a thorough evaluation of the evolving external landscape".

Chief executive of the group, Mike Roman, said PFAS can be made and used safely, but he said the "rapidly evolving landscape" in terms of regulatory and business demands had persuaded 3M to discontinue its production of all fluoropolymers, fluorinated fluids, and PFAS-based additive products.

The company said it would help facilitate "an orderly transition" for customers and fulfil current contractual obligations during the transition period. It has already reduced its use of PFAS over the past three years. ■

Elite-level bounce for everyday runners

Athletic footwear brand ASICS has launched a new performance running shoe called Superblast, part of its Blast range. It described this latest version as being "super bouncy" owing to its use of foam technologies.

It contains a proprietary foam called FF Blast Turbo in the midsole. To date this technology has only been used on the brand's fastest running shoe, the Metaspeed, which many high-level distance athletes are using.

According to the brand, the Superblast shoe is more for everyday training runs. But it added that it would work well for "eager runners who want the thrill and excitement of the high energy-return enjoyed by elite athletes, turning their everyday run into an extraordinary experience".

Other features of the shoe include an asymmetric mesh upper. Composed with specially created engineered mesh rendered with a two-toned colour palette, it creates "aesthetically intriguing patterns for visual playfulness", the company said. ■

PLA resin breakthrough for Teijin

Fibre developer Teijin has unveiled a new polylactic acid (PLA) resin that it says will biodegrade faster in oceans, rivers and soil than conventional PLA products do.

The Japanese group explained that it has added a new biodegradation accelerator to the polymer, and claims that this improves its biodegradation rate without impairing strength, mouldability or other properties.

According to Teijin, the new PLA resin will help reduce microplastics in the environment. It said reductions in CO₂ emissions were also possible because the new resin is made from plant-derived raw materials.

It will begin producing and selling pellets, injection- and extrusion-moulded products, textiles and non-woven fabrics made with its new PLA resin this year. ■



Backtrack

08.02.23

UK online shoe sales shone brightest in January

India set to break export record again

07.02.23

At least 250 new stores per year for JD Sports

06.02.23

Footwear and Leathergoods lead the way for Italy in South Korea

03.02.23

India International Leather Fair returns after pandemic hiatus
Good results for Aku after difficult year

01.02.23

VF finds new Tokyo design base has Harajuku style

Nike pairs up with Tiffany's

Shoe and leather components exports from Brazil grow in value in 2022

31.01.23

Record revenues take Louis Vuitton past major milestone
Cyber incident at JD Sports

30.01.23

Tod's group set to break the €1 billion barrier again

27.01.23

Workshops for Converse team
India's leather industry thrives as lockdowns blunt China exports

26.01.23

Shoe from Garmont is a winner in the Design & Innovation Awards

25.01.23

The Athlete's Foot boosts its marketing team
Online strategy works well for Spanish brand
Disruption hits Dr Martens
Adidas and Reebok alum steps up at Fila

24.01.23

Colombia will maintain 35% tariff on footwear imports until 2025

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 the news items you may have missed.

23.01.23

Major changes coming for Anta's executive team
Madrid prepares for Momad

20.01.23

Capsule collection will mark Garmont's work with ACBC
Colombia gets ready for leather and shoe fairs

18.01.23

Decathlon co-founds Spanish textile waste alliance
Documentary wins awards for Clarks
New owner for White Mountain Footwear Group
Treksta developing 'Korean-style' bobsled shoes

17.01.23

Nike's new book anticipates next 50 years of design
Educating the consumer is paramount for Leather UK

16.01.23

New York court finds against adidas in stripes row

13.01.23

Footwear brand named in NPD Retail Performance Awards

12.01.23

Turnover boost for Italian footwear tells only part of the story
Potential strategic buyer for Wolverine Leather

11.01.23

Supercar brand inspires second special APL shoe collection

EMEA reshuffle shows more movement at top of VF
Merrell Korea in closer alignment with Japan

10.01.23

Japanese presence at Pitti Uomo
Sharp increase in low-priced footwear imports into Mexico

09.01.23

CLE chairman sets record straight on Russia
South Korea announces \$1bn in fashion sector support

06.01.23

Middle East appeal for Dune
Turnaround at the top for Prada

05.01.23

Go Sport cheered by new CEO amid struggles
Timberland expands store network in Mexico

04.01.23

Moda to host De Montfort shoe design awards
German investors celebrate 2022 GDP growth for Vietnam

03.01.23

Brazil footwear imports still dominated by Asia

21.12.22

Paris-based brand develops Van Gogh-inspired shoes
Nike advances despite high inventory levels
Two new styles from Garmont
AAFA welcomes nine-month extension of tariff exemption

THE MATERIALS SHOW



NW

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March
1 & 2

NE

Boston, MA

March
7 & 8

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From one crisis to another

Stuart Cleaver, *World Shoe Review*

2022 was supposed to be the year of 'lift off' after the 2021 partial bounce back from covid and a general reaching of pre-covid levels of production and consumption. In fact, covid-19 and its variants continued to linger and were added to by a new series of global problems. The Russian invasion of Ukraine was the headline maker, particularly in Europe. Other obstacles to growth included inflation being higher than for decades, energy supply shortages and its weaponising, coupled with delayed deliveries. Indeed, the slowdown was broader-based and sharper than predicted. Growth was heading to be the weakest since 2001 except for the 2008 global financial crisis and the most severe covid period in 2020.

Figure 1 shows 2021 growth compared to forecasts for 2022 and 2023. Of course, single years should not be taken in isolation as some results in 2021, such as the UK, were the result of one of the sharpest falls the previous first covid year. Inflation was 4.7% globally in 2021 and was predicted to reach 8.8% in 2022, 6.5% in 2023 and 4.1% in 2024. So, a difficult couple of years is forecast by the IMF and others. The global economy is therefore hugely impacting the footwear sector.

Footwear sector in 2022

The early signs were that the shoe industry would be able to continue its progress onwards from 2021. This may be seen, for example, in the performance of shoe

imports into the important US market as it is the most lucrative and extensive. The period January to September saw imports rise by 357 million pairs or 21%. This was largely due to China which sent 179 million pairs more than in the same period in 2021, an increase of 18.6%. As expected, however, since then growth in both is slowing down and that year-end figures are likely to be more modest but still possibly over 15% higher than 2021 for the US and over 12% for China.

Nevertheless, this does indicate both that the US market was recovering and that China, despite its zero covid lockdown policy, was also managing to increase its exports. It is a pity that full 2022 figures were not available at the time of writing but even with escalating problems such as rising inflation, energy supplies, delivery problems, the Russia's invasion of Ukraine, lingering covid, worries about winter fuel, plus local difficulties such as the fiercely fought Brazilian election, it is highly likely that 2022 will be seen to have pulled itself back to pre-covid levels and exceeded them in some countries and some sectors.

There was also evidence that some American and European buyers in particular were starting to diversify their sources of supply or increase diversity where such action had already been taken. This was exacerbated by China's zero covid policy with further lockdowns and consequent lack of supplies to western buyers. In any case, some buyers were taking the view that Chinese

costs were becoming too high and that they needed to seek lower cost suppliers in order to remain competitive.

The invasion of Ukraine also showed the danger of being over reliant on one supplier. In this instance energy, and particularly Germany's reliance on Russian gas. China, however, continued to dominate the global market. As seen, the expanding USA market once again saw China as its main supplier with a rise of over 20%. In November, stock markets were reacting to news that China would soon start to lift its strict zero covid rules, probably in early 2023. Besides the effects the initial ruling had on export deliveries, there have been other factors such as the huge Chinese market for raw materials being closed; exporters of luxury goods to the country have also suffered through lack of access.

Fashion and sustainability

Another topic of interest in 2022 was the fast fashion industry and how it is fitting in with concepts such as sustainability and working conditions. Sustainability is a word that is increasingly being seen in mission statements and other forms of promotion, and aims to be seen as offering a long term panacea. To some observers, sustainability should in fact cover not only environmental matters, but also economic, social and other elements as well.

The fashion industry is said to be responsible for 92 million tonnes of waste each year. In the USA alone, this includes 300 million pairs of shoes. Vivobarefoot estimates 22 billion pairs are dumped globally and that in the UK and USA, 90% of footwear will end in landfill, many within a year. 77% of consumers claim to want brands to reduce waste and 60% say they would pay more for sustainable footwear. Vivobarefoot itself has introduced ReVivo with an 'end of life solution'. Environmental sustainability consultancy Quantis claims that footwear is responsible for 1.4% of greenhouse gas emissions. Eram in France has 10 apparel and footwear brands and has run its own sustainability programme Change For Good since 2018. Its goal is to demonstrate that mass market fashion can be both socially acceptable and profitable. The company's sustainable development director, Isabelle Desfontaines says, "If fashion is not circular it will not exist."

The results of Asos.com, a leading UK on-line fashion business, for 2021/2022 (to 31.8.22) saw sales grow by only 1% to £3.94 billion with pre-tax profits falling 89% to £22 million and a need to write off £130 million of stock. Whilst the UK remained a strong market, overseas sales were sluggish. The question is therefore whether a fast fashion model is appropriate where sustainability and the aspects of sourcing cheap materials and labour are becoming ever more important. As a result of this, the company has indicated that it needs to revolutionise its business model.

Lasting effects

The changes caused by covid are worthy of further study to see if they have become permanent or whether there has been a return to 'normal'. For instance, working at home has continued to some extent. With higher winter heating costs will this mean that employees will be encouraged to work at home or will

FIGURE 1: 2021 GROWTH FORECASTS

World	2021	2022 (est)	2023 (est)
USA	5.7%	1.6%	1.0%
EU	5.2%	3.1%	0.5%
UK	7.4%	3.6%	0.3%
Japan	1.7%	1.7%	1.6%
China	8.1%	3.2%	4.4%
India	8.7%	6.8%	6.1%
Russia	4.7%	-3.4%	-2.3%
Latin America	6.9%	3.5%	1.7%
Brazil	4.6%	2.8%	1.0%
South Africa	4.9%	2.1%	1.1%
Total	6%	3.2%	2.7%

SOURCE: IMF (INTERNATIONAL MONETARY FUND)

they find it too expensive in fuel costs? Will indoor footwear, comfort footwear and sports footwear still reap dividends rather than fashion footwear? A related theme from the Russian/Ukraine war could be that armies and ministries of defence demand more funding for military and safety footwear.

Interim 2022 results from leading sports brands, for example, were showing restricted growth until September. Adidas, in the first nine months was showing a 1% increase over the previous 2021 period in currency neutral terms or plus 8% in euro terms. By September, markets were slowing in Europe and America, China was still suffering from the zero covid shutdown, loss of the Russian market had an impact, while overstocked inventories called for more promotion. However, there are signs from many leading brands in the US predicting their 2022 results will be positive. For example, Wolverine foresees a rise of between 10% to 11.6%, Skechers were up 19% in the first nine months and is expecting an annual result of around \$7.3 billion. Caleres is looking at plus 4% to 6% and Columbia plus 10% to 12%.

Summary

The year progressively became more difficult for many countries for the reasons given above. It would seem that, at this stage, results could go either way. US imports during the year suggest a rise on 2021 especially with Chinese exports being strong. After a fall of 15.1% in the first covid year 2020, 2021 had been more positive with a bounce back of plus 11%, although for many countries not yet to pre-covid levels. Shoe production and consumption are likely to be in advance of 2021 largely due to the first nine months of the year but lower single digit growths are likely. We do live in uncertain times where it seems that anything could happen and it would be a brave person who would be prepared to forecast with any degree of certainty what the next two or three years might bring. ■



Beyond IoT and towards servitisation

Sergio Dulio

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Back in 2017 *The Economist* made a bold statement in declaring that the world's most valuable resource was no longer oil but data, a commodity in a lucrative, fast-growing industry very much like oil was a century before. The article was in fact about the dominance of the big tech companies Alphabet (Google's parent company), Apple, Amazon, Facebook (now Meta) and Microsoft which were based on digital technologies and first understood how value could be extracted from the data they generate. The article went on to argue the necessity to regulate this market and make sure that none of these companies (or worse a cartel of them all) could have a complete dominance. Something that, after five years, I am not sure that we have in fact avoided.

It nevertheless attracted attention in many other sectors, including manufacturing, as to whether the same approach could be adopted to their processes on how to make them more digital and how to use the data generated in these new digital processes as a source of additional revenue for companies. They became progressively aware of the relevance of data and of the fact that, in order to generate it, products, machines and processes had to become 'smart'. They also soon realised that generating data is a relatively simple task whilst the real challenge is extracting value from these data, which in turn requires having a multiplicity of them, storing them somewhere and using

intelligence to analyse them in order to offer new added value services to customers.

In 2014, in what is considered the seminal paper on this subject, Michael Porter, a professor at the Harvard Business School and James Heppelmann, the then CEO of PTC, a leading maker of industrial software, introduced the concept of smart, connected products and explained how they were transforming competition among companies. Once made solely of mechanical and electrical parts, products (namely machines) have become complex systems that combine hardware, sensors, data storage, microprocessors, software and connectivity. These 'smart, connected products' made possible by vast improvements in processing power and device miniaturisation, and by the network benefits of ubiquitous connectivity, have unleashed a new era of competition.

What we are now seeing is an evolution in what we mean by the word machine; not only a piece of equipment capable of executing a certain task in a more or less automated manner, but a device enhanced by sensors, capable of generating data and is connected. Incidentally, smart and connected products, and the range of different technologies they incorporate, are the building blocks of the so called fourth industrial revolution or Industry 4.0 and of its future evolution into Industry 5.0. What we want to

discuss here are some of these technologies such as IOT and the related other elements such as data cloud storage and computing, big data analysis and the new business models they enable.

IOT and servitisation

The Internet of Things or IOT, describes physical objects (or groups of such objects) with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communication networks. Although devices do not strictly need to be connected to the public internet, but only to a network and be individually addressable, extending their connectivity to the whole worldwide net expands the capabilities and potential of these objects. As a result, the definition of IOT, as opposed to the old-fashioned Internet of humans using computers, has been commonly adopted.

Connected devices that generate and exchange data can be anything from our smartphones to cars, from home appliances to mobility infrastructures and from medical equipment to surveillance cameras. When we consider machines on a shop floor, we should rather use the term IOT to refer to a specific family of components and data transmission protocols that are compatible with a manufacturing environment. It is estimated that connected devices at the end of 2022 reached 13.14 billion (Statista 2022) and that this number will more than double by 2030 when we will have almost 30 billion devices in the network. It is an incredible amount that greatly surpasses the number of human beings on Earth.

So, what can a company do with this wealth of data that billions of connected machines gather and share? They can offer an impressive number of added value services to their customers in what becomes an effective bundle of machine and service. This is evolution towards servitisation, where the term is used to describe the transformation of a business to compete through a combination of services and products rather than products alone.



Digital tablet computers with augmented reality software can connect with high-tech machinery to visualise future maintenance or replacement requirements.

CREDIT: SHUTTERSTOCK/GORODENKOFF

Hence, it is the process of gaining multiple revenue streams by providing supporting services to produced goods.

Three main levels of servitisation exist. In a basic offering, it involves turning on basic services such as the provision of spare parts. At an intermediate level, the process aims at offering external services such as maintenance and repair tasks. At the highest level of advanced service, it refers to the process of offering machines produced on a contractual basis where the output or use of the machine is focused upon. For machine suppliers this means moving from a transactional model in the interaction with customers in which all revenues are generated at a single time when the machine is sold, to a relational one where revenue streams are multiple and endure over time. Quite a radical change of mindset for companies in many sectors that, leveraging on modern technologies, are embracing this new business paradigm.

Atoms and bits

Upgrading a machine to make it smart is a transformational journey from atoms (hardware) to bits (data), from disconnected to connected, from the material to (almost) immaterial world. It all starts with the electronic and control architecture of the machine. Components at this

level (electrical motors, electronic drives, input and output devices) are chosen for their capability of exposing data and signals about their status and their operational conditions. These basic elements are complemented by other sensors that can monitor an expanded set of conditions so that the machine can project a full data model of itself and its operations.

These raw data are then processed by a local brain, a firmware code that is executed on what is known as an edge device. Preprocessed data are then sent through a connectivity device via the Internet to a cloud infrastructure where they are stored. Finally, a set of API (application programming interfaces) make these data available to apps (applications) that process them, often using Machine Learning algorithms to extract patterns that detect, for example, potential machine failures that can then be predicted before they occur. This is the classical case of an advanced predictive maintenance service that is offered to the customer to totally avoid the risk of machine stoppages due to failures. The process the machine executes (for example cutting) is no more important than the data generated in the process and that can be used to increase the OEE (overall equipment efficiency) of the machine

itself, optimise its performance and fine tune its working parameters. In this sense they create an additional value to the supplier offering.

The data value chain

In this entire process we can see how, at each step in the pipeline, the value of data grows in what we can define as a 'data value chain'. Initially, they are created and extracted by the various onboard sensors in the machine; then data are produced (preprocessed) and initially analysed. Wherever data exist, especially in mission critical operations, their integrity and security must be guaranteed and this requires the adoption of special equipment and of adequate software provisions. Data are then valorised using software applications based on AI and ML to make them eventually available for use at the end of this value chain by machine operators, plant managers, other decision makers or, in a more extreme case, the machine itself. This last situation may sound exotic, but there is a growing interest for a scenario called 'machine customer', where the machine, using the predictive capabilities stemming from the gathered data and the ML algorithms, can anticipate the failure of its components, order the needed spare part autonomously and get it delivered before the failure occurs.

The purpose of this data value chain is, therefore, through this extraction of value, to take decisions and improve interaction with the products (machines) and the bundled services. However, the full implementation of this data-centric paradigm relies on two more pillars, data sharing and digital culture. Data sharing enables new business models based on the value of information exchanged within the company or towards partners, suppliers and customers, a digital ecosystem that surrounds and incorporates the individual machines. Finally, this evolution is not possible without the creation of a digital culture within the company that supports people and organisations in developing competences and digital processes.

New business models

How does all this reflect on company business models in a classical relationship between a machine supplier (OEM) and its customer? Let's look at what happened in the past. As we have already mentioned, the business model was transactional, with the customer and the OEM at opposite ends of the value chain. The OEM sells the machine, the customer uses it. When something goes wrong and a failure or an accident occurs, the customer sends a support request. The OEM (or some other entity designated by the OEM) analyses the problem, identifies the cause and eventually takes care of the repair or replacement of the broken part or, if necessary, the entire machine. In this scenario the only value for the OEM is the product (the machine) and typically the service becomes a mere cost that, in a final balance, erodes the revenue margin generated when the machine was sold.

Recently, we have seen an evolution in this model and, today, OEMs are closer to their customers in the sense

“In view of the latest developments in servitisation, senior managers may need to take a serious look at their business models or fall behind their competitors.”

that the terms and conditions upon which the OEM guarantees the continuity of operation by the machine is contractually defined and well structured, for instance, with a service contract that specifies a set of regular maintenance or repair services scheduled in time. In this case the product (the machine) still takes the largest share of the value for the OEM, but the service contract becomes an element of differentiation and of enduring relationship with the customer.

Where then is this digital transformation leading companies in relation to evolving their business models? Eventually this will end up in a fully relational model in which OEM and customer strengthen their relationship with the goal of eliminating completely all machine down times and of maximising its performance. Services like real time monitoring, insight diagnostics to spot anomalies or even predictive insight to anticipate them, form the background of a framework in which the OEM and the customer become actual partners; in this scenario they aim for a long-term collaboration based on the life cycle extension of the system. This is the full exploitation of the servitisation model where product and service generate value together in an intimate bundle.

Elaborating further on this model we can imagine in the future a situation where a 'pay per purchase' of the machine is replaced by a 'pay per use' or a 'pay per output' and the OEM is rewarded for continuity of the manufacturing service it offers to its customer and on the number of items per time that are produced. This is no less than a Copernican revolution for conventional machine suppliers that want to venture along this challenging path. It requires a radical shift in company mindset, the calculation of the economics of the new business model, the elaboration of a set of different contractual frameworks, a restructuring of the customer service and machine maintenance functions, and an upskilling of human resources in the company. Not an easy journey for sure but the reward at the end is likely to compensate for the effort.

In conclusion we may ask ourselves whether for machine suppliers this is an option or an inescapable choice. To answer this question, we should consider the market situation that companies face nowadays. A redesigned globalisation scenario, a scarcity of supplies, a growth in the cost of raw materials and components and fiercer competition are all eroding the profit margins that derive from the sale of the machine. Complementing this with additional revenue streams, based on longer and stronger relationships with their customers and doing that before their competitors do is the only way to stay ahead and secure the future of their businesses. ■



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The circular economy and recycling footwear

Shahin Rahimifard,

SMART (Centre for Sustainable Manufacturing and Recycle Technologies)

The growing focus on the climate crisis, an ever-rising global population now exceeding eight billion, the increasing vulnerability in energy and material supply as well as the post-pandemic market and economic uncertainties, has created a perfect storm in which a sustainable approach to production and consumption of manufactured goods is seen as the most vital ingredient of global mitigating strategies.

Footwear manufacturers of various size and reach, from established multi-national volume producers to small innovative entrant companies, are actively researching and proposing solutions to improve the overall sustainability of the footwear sector. Addressing sustainability challenges within any manufacturing sector, particularly footwear, are truly complex, wide-ranging and interrelated. Environmental concerns regarding sourcing of materials, use of chemical substances and enormous transportation impacts as well as dealing with production, retail and post consumer waste, cannot be addressed independently from economic pressures caused by a prevalence of dated business models that often rely on mass volume production and sales. Nor can socioethical issues related to working conditions of employees and increasing demand by consumers for sustainable products. This highlights an urgent need for global coordination of initiatives based on the pre-competitive model which is increasingly being adopted in many other manufacturing sectors in order to deal with footwear's sustainability challenges.

Among these challenges, the ones related to the most efficient use of resources and improving the long-term resilience of the footwear supply chain have been the focus of many recent studies. There is no doubt that the massive and growing footwear industry is resource-imbalanced. Virgin materials go into the front end while used resources are largely wasted at the back end. Industry and consumers recognise that this cannot continue and that the circular reuse of materials and/or products is the only approach to safeguard the future of the industry. The Circular Economy (CE) is a term applied over the last decade to a system in which material resources are retained to perform useful functions rather than being lost in landfills or converted to energy. The CE approach reduces environmental impacts from extraction, transport and preparation of virgin materials as well as total product lifecycle costs, thus benefiting producers, consumers and the environment, as well as the productivity of economies.

CE in the footwear sector

Adoption of a circular approach within the footwear sector could be viewed at product level in terms of life extension through reuse, repair, reconditioning and remanufacturing or at material level by reclamation and reuse of recycled materials based on open- or closed-loop approaches. In this context, several initiatives have been set up for recovery of unwanted used shoes from consumers that could be reused either through exporting them to less developed countries via charitable organisations or by reselling to

second-hand markets after minimal sorting and cleaning. In either of these cases, a substantial proportion are often not suitable for reuse due to poor condition or lack of consumer demand and are currently sent for energy recovery or to landfill.

Whilst repair of footwear is a long-established process, often performed by small independent service providers and is still carried out in some countries, a lack of economic viability and consumer acceptance are increasingly limiting its application within many developed as well as developing countries. Instead, there has recently been a growing number of large-scale take-back (often through sending back via post or collecting shoes in retail outlets), reconditioning and/or remanufacturing services mainly targeted at high value branded shoes due to consumer pressure to provide an alternative to landfill. These services are often initiated and/or directly linked to the original footwear producers. However, the common adoption of such life extension approaches is severely impacted due to the increased design complexity and material mix of modern footwear products. In addition, while a circular approach at product level through reconditioning or remanufacturing often provides more preferential environmental benefits, there is a functional limit to the number of their applications on a particular pair of shoes before reclamation of materials becomes the only viable option to landfill and/or energy recovery.

End-of-Life (EoL) footwear waste requiring material recycling may be generated from different sources at various stages of lifecycle, ranging from shoe prototypes, production rejects and customer returns to industrial waste (shoes produced but not sold), seized counterfeits and post consumer worn shoes. It is estimated that every year in the UK over 200 million pairs of shoes join a pile of older worn but no longer used or discarded shoes. Worldwide, this is in the order of 20 billion. Dr Mark Zhu, market segment manager for footwear, sports and leisure at BASF Performance Materials North America, is recently reported as saying that, "A circular post consumer life for shoe material needs joint effort from shoe brands, shoe manufacturers, material suppliers and stakeholders in the entire supply chain related to recycling."

The footwear sector's response to this urgent need for circular use of material and footwear recycling has been based on three distinct clusters of initiatives. Firstly, through a number of innovative designs and material selection initiatives that aim to adopt a 'design for recycling' approach through producing shoes made from fewer material types such as PET or PE (often in single colour to aid with reuse of recycled material) or use of recycled materials frequently sourced from other industrial applications to produce uppers (recycled plastic yarns), insoles (recycled ETPU foams) and outsoles (reclaimed rubber or mixed recycled foam and rubber).

Secondly, there has been a rapid growth in the range of biomaterials used in footwear production, ranging from fruit, mushroom, mycelium or cactus derivatives, pure natural rubber from FSC and degradable yarns from kelp (algae) to nano-bacterial cellulose,



Figure 1 : Manual disassembly of shoes for component reuse and/or material separation.

SweetFoam, EcoTPU and a variety of other biopolymers. The third cluster is based on collection and grinding of shoes to obtain a range of granulates used in making surfacing and/or underlay materials (open-loop approach) as well as through further processing to produce recycled materials, such as rubber granules used in the production of footwear products (closed-loop approach).

These mechanical material recycling processes, though currently applied to only a subset of shoe types such as trainers or footwear products that do not contain metals, are seen as the only circular option for the very large annual volume of EoL shoe waste that cannot be reused, repaired or remanufactured. However, these existing footwear recycling practices cannot deal with the recovery and reprocessing of mixed post consumer shoes which constitute more than 90% of EoL footwear waste, as dealing with such waste containing a complex mix of materials most of which are in average to poor condition, necessitates a distinctly different and more comprehensive approach.

Current recycling technologies

Centre for SMART has been a leader in exploring how EoL value can be released from footwear products. R&D activities over the last two decades have resulted in significant progress in EoL footwear material reclamation. Shoes are difficult to recycle due to the multiple functions they perform, which require a huge range of material specifications between and within brands. These material specifications vary in terms of many parameters, including material type, mechanical properties such as strength and flexibility, the presence of additive substances including fillers, stabilisers and dyes, and various forms of joining materials. Up to 40 different materials are used, ranging from leathers (tanned and finished using different chemicals and dyes), soft and rigid rubbers, EVAs and other flexible polymers, foams, textiles and metals, all of which are joined together using various stitching materials and adhesives.



Figure 2 : Automatic disassembly of shoes using specially design cutting operation



Figure 3 : Automatic disassembly of shoes by using specially design tools and fixtures.

A number of recycling processes have been developed to improve the quality of recycled footwear materials. Many of these are now commonly adopted and used within emerging commercial footwear recycling companies. These include the manual disassembly of uppers, insoles and outsoles (Figure 1) for two purposes: to experiment with reuse of the components in new footwear production and/or shoe repairs and to assess if separation of materials through manual disassembly would improve the quality of recycled materials during downstream processing. Both processes are now applied by several footwear recycling companies, mainly however on a small scale and often for

reprocessing new shoe waste such as production rejects, consumer returns and industrial/retail waste. This is because of the higher quality of extracted components and/or materials that can be obtained, as well as concerns over economic viability of large-scale applications due to inherent high labour costs.

The automation of footwear disassembly processes has also been investigated through either simple cutting operations (Figure 2) or through specially designed tools and fixtures for ripping apart the upper from the insole and outsole using robots (Figure 3). While the cutting operation works well with shoes with flat and standard profiles, it fails to achieve acceptable separation rates

for shoes with complex upper and heel designs (Figure 2). Similarly, automation through specially designed tools and fixtures provides promising results for shoes with simple upper designs, stitching profiles and standard adhesive materials. It performs poorly however with complex shoe designs, particularly those with rubber soles (Figure 3). Future research in footwear disassembly will focus on a mix of thermal and chemical processes using specially formulated adhesive materials.

More recent activities at the Centre have focused on the mechanical recycling of shoes using fragmentation and material separation technologies, many of which are commonplace in recycling many other large-volume manufactured products. However, the specific nature of production methods and materials characteristics in footwear products necessitates a careful and special readaptation of these existing separation technologies. This has led to the development of a number of bespoke processes and equipment designs to improve the material purity and yield from the recycling of a wide range of footwear products (Figure 4). The main objective of the mechanical recycling line, now being further developed and enhanced, is to deal with by far the greatest proportion of global EoL shoe waste currently not dealt with by existing recycling practices, namely multiple brand and multiple material mixed post consumer shoe waste. This requires new technologies for the automatic sorting of shoes prior to commencement of reprocessing, a range of reconfigurable recycling processes to deal with a wider mix of material being processed and inclusion of hybrid processing based on thermal, chemical and biological technologies to improve purity and quality of recycled materials, thereby increasing applications for them within footwear and other industries. Novel footwear recycling lines based on these hybrid applications of recycling technologies are being investigated.

In addition to this technological focus, the latest footwear recycling



Figure 4 : Fragmentation and separation of footwear materials.

R&D activities at the Centre have also explored a range of whole system considerations for wide-scale applications of CE within the footwear sector, including the development of computer aided 'design for circularity' tools to improve recyclability of future footwear products, conducting LCA (Life Cycle Assessment) studies to support the environmental benefit analysis of alternative EoL options, such as recycling versus energy recovery and landfill, and investigating alternative circular business models to assess the economy of scale and financial viability of material recycling particularly for post consumer worn shoes.

Conclusions

Developing a holistic long-term sustainability strategy for modern footwear manufacturers must be based on a Life Cycle Sustainability Assessment, which includes not only environmental considerations but also the economic and socioethical implications of their products as well as their production and supply chain systems. Moving from linear to a circular use of products and materials forms an integral part of safeguarding the future sustainability of the footwear sector. While there has been a significant increase in efforts and investments throughout the last decade directed at improving footwear circularity and resulting in many advancements, the careful analysis of current progress and proposed solutions leads to a reiterating observation that in most applications a limited, disperse and piecemeal approach has been adopted without considering the wider implications of proposed solutions or taking in to account the bigger picture as listed here.

1. While re-manufacturing services appear to provide the many reported benefits of extending the life of a product, the environmental impacts of reverse logistics, cleaning and reconditioning processes in smaller scales needs to be carefully assessed against benefits of large-scale batch production of footwear products.

2. Footwear products made from fewer material types will undoubtedly simplify recycling at end-of-life. However, this necessitates a bespoke take-back and collection infrastructure, possibly based on a multi-brand initiative, because mixed collection and reprocessing of these shoes with other general footwear products nullifies any potential benefits gained through simplification of material selection and use.

3. Shoes made from biomaterials may provide many potential environmental benefits, though this needs to be carefully analysed and assessed in each case using a detailed LCA study. However, often no specific EoL option has been proposed for such products. If their biodegradability characteristics are to be taken advantage of, this again requires a bespoke take-back and collection infrastructure to ensure a bioenergy recovery route as opposed to landfill in order to avoid the greenhouse gas generation associated with biodegradable waste. In addition, a mixed collection and reprocessing of these shoes at end-of-life with other footwear products would again add to the complexity of material separation during recycling processes, as well as the quality and consistency of recycled footwear materials.

4. Current trends in large-scale granulation and downcycling of footwear materials (e.g. as surfacing or underlay products) will subsequently generate low value complex waste, often after a short second life for these materials, which are more challenging to recover and recycle. Such downcycling applications, therefore, represent a 'delay time to landfill and/or energy recovery' rather than a long-term circular use of footwear materials.

This lack of whole-system thinking for the application of a circular economy in the footwear sector highlights the need for a joined-up cooperative global initiative based on the aforementioned pre-competitive model, as the size and complexity of the challenges faced by the footwear industry often make it unfeasible for any single manufacturer to address them on their own.

Whilst progress is being made by many other apparel manufacturers on the circularity of their products, the footwear sector is lagging behind and appears to still be stuck in a linear economy. There is no doubt that the recent and gradual advances in redesigning footwear products as well as collection and reprocessing of EoL shoes within many communities and countries represent very positive developments. At the same time, there is no hiding from the fact that as much as 90% of footwear waste, mainly post consumer unwanted and old worn shoes is still ending up in landfill. This, clearly, cannot continue due to many current and upcoming legislative, societal and environmental pressures. At Centre for SMART, we are committed to the vision of zero-waste landfill for footwear products and are looking forward to working with key stakeholders and industry leaders to fully implement a circular approach in which materials are not consumed but only borrowed to address current needs and returned for further reuse. ■



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Green Shoes 4.0

Maria José Ferreira and Green Shoes 4.0 consortium

The world is facing challenges that are causing the footwear sector to accelerate its efforts to be sustainable by developing and adopting green and digital solutions and business models. Fashion businesses need to help minimise depletion of the planet's resources and greenhouse gas (GHG) emissions, solve complex problems such as those posed by climate change. As has already happened in Europe, global fashion also needs to tackle environmental issues including recycling, water and land usage, and GHG. They also need to adopt responsible business models that help prevent and compensate for 'loss and damage' caused by climate breakdown. These include promotion at production level of good health and safe workplaces, renewable energy, heat and flood mitigation if applicable, salaries and social protection systems. At consumption level, it calls for durable long lasting goods, repair, reuse and circularity.

There are, however, many potential areas of intervention and a number of variables still remain, so significant research and innovation needs to be done. Firm steps are being accomplished within Green Shoes 4.0, a Portugal 2020 R&D collaborative project. It is promoted by a group of 15 companies covering the whole footwear value chain and includes leather, soles, software, production equipment, leather goods and

footwear, representation and leadership, plus eight R&D bodies with complementary capabilities. As explained by Maria José Ferreira, Director at CTCP (Centro Tecnológico do Calçado de Portugal) and Green Shoes 4.0 coordinator, it aims to develop new leathers, soling materials, software, production systems, footwear concepts and business models (Figure 1).

Functionalised circular leathers

Leather is a renewable biomaterial that presents excellent physical and comfort properties for use in leather goods and footwear. It has high resistance to repeated flexion, tearing and abrasion, resistance to water penetration, good sweat absorption and desorption, and even resistance to heat and fire. From a sustainability point of view, it deserves to be highlighted that leather is very durable, repairable and that its use contributes to recycling animal hides, an organic waste from the meat industry, even though leather production also results in waste. Important product features appreciated by footwear brands and consumers include materials having high physical resistance, lightweight and are recycled and/or recyclable, thus increasing footwear comfort and overall sustainability.

In this context, Green Shoes 4.0, CTCP and partners IPB, CTIC, Boaventura and Fontevelha teams work

included the modification of leather's internal structure to increase mouldability, reduce density (weight), increase the area usable in final products and the use of leather production waste. Leather functionalisation was promoted by hydrolysed by-products obtained from solid leather residues and commercial microparticles of low density that are hollow and rigid or elastic and expandable, which allow modifying and filling of the leather's structure.

Preliminary tests indicated that the microparticles are best positioned on the surface and not penetrating the interstices of the skin. Reinforcements based on leather hydrolysate (water resistance) from wet white and wet blue leather waste, composed of mixtures of proteins with different molecular weights, as well as different levels of functional groups (NH₂), and transglutaminase (fillers) were tested and incorporated by chemical anchoring into the leather's structure. The samples were subjected to light microscopy and SEM (electron) microscopy. The SEM results showed that wet white hydrolysate led to better filling of the leather's structure than the wet blue. Analysing the physical and flexion test results shows that the best percentages to employ are between 25% and 50% hydrolysate.

Recycled soling materials

Green Shoes 4.0, CTCP and partners IPB, UMinho, Atlanta and Procalçado are developing materials for use in flexible, durable, lightweight and recyclable soles. New formulations, processes and advanced additives have been studied with the aim of developing high quality thermoplastics and materials incorporating up to 90% recycled content have been developed. Test results confirm the optimised materials have properties 'like virgin materials' and soles meet the specifications required by fashion and more demanding casual footwear. Additionally, the teams have worked hard on the development of materials incorporating soles and footwear production waste (ground and devulcanised) and post-consumer footwear including rubber, fabrics, glues and paperboard (Figure 2). Soles developed by Atlanta and Procalçado

Figure 1: Main areas of R&D for the Green Shoes 4.0 project.



using these materials were tested in regard to density, hardness, resistance to abrasion and fatigue, tearing, traction and elongation at break. The results indicate they are ready to enter the market immediately.

Digitisation of the value chain

Green Shoes 4.0 has several new concepts in terms of digitisation, with company CEI by ZIPOR developing software and tools to digitally connect leather suppliers and their clients to shorten the processes of leather digitalisation, nesting and cutting. AMF and INESCTEC have been working on a consumer profile, trends and 'forecast' system, that extracts relevant indicators for analysing customer purchases and preferences to define more efficient production planning with faster overall response times to boost sales. An innovative footwear soles injection planning system has also been studied with regard to tactical planning (lot-sizing) and operational planning (scheduling). Work carried out included the development of a mathematical model that would solve the problem of tactical planning. The result is an aggregated production plan that indicates which production orders to produce each week for the chosen time span (normally between

two and six months) and forecasts stock needs and delays in deliveries to the client. Practical usage by shoe manufacturer AMF indicates up to 15% greater production efficiency.

New product concepts

Green Shoes 4.0 partners are actively deploying new products and concepts. One example is LeatherGoods by Belcinto. The new brand set itself the difficult objective of producing items only using surplus materials from previous collections and production, reusing them and using them fully, without generating new 'leftovers' in the process. This forced them to think the design through rigorously looking at a piece in every respect to fully satisfy functionality issues without failing to please and even surprise consumers, and keeping up to date without compromising on sustainability. A work that both amuses and rewards. The result is a deeply original line, with roots planted in the company's DNA, producing prestigious leathergoods made with exceptional world-class quality for international markets, while preserving the environment with eco-friendly providers. ■

The Green Shoes 4.0 project is due to run until the end of June this year.



Figure 2: Moulded soles incorporating recycled materials.

CREDIT: ATLANTA & PROCALÇADO



Comfortable high heels

Women have always favoured high heels for a number of reasons. As they are usually smaller in stature than men, high heels make them taller and this makes them feel more confident and empowered. They also tighten the calf muscles making legs look slimmer and more seductive. However, this comes at a price in terms of comfort as high heels can become extremely uncomfortable if worn for a long time as they place all of the wearer's weight on the front of the foot. This places extreme pressure on the ends of the metatarsal bones and joints, increasing the risk of stress fractures and neuromas (disorganised growth of nerve cells at the site of a nerve injury) among other potential injuries. It is no wonder that most women end up preferring flat, comfortable shoes despite the age old appeal of high-heels.

Italian company Gait-Tech says that it has the answer and that it is the first company to integrate a biomechanical solution in the insole of high heeled shoes during the production stage without compromising design and stylistic aspects. The device

received an official certificate from the Orthopedic Institute Rizzoli Bologna and has earned an international patent for the innovative invention from the official Italian Office of Patents and Trademarks – Ministry for Economic Development. The device is designed to improve the sustainability of human health, posture and gait through improving the comfort of high heels and is based on many years of research and in-depth studies. Made from recycled polymer, the biomechanical device consists of specific and differentiated support surfaces for each single metatarsal head to redistribute pressure on the ground and cushion impact,

There have been various devices over the years that have approached this problem but have been too bulky for use in refined fashion designs. Gait-Tech says this new device does work and to emphasise this fact, footwear designer Diego Dolcini has been appointed creative director. Dolcini has built a reputation working with leading fashion manufacturers such as Gucci, Emilio Pucci, Narciso Rodriguez, Vionnet and Balmain. He will be in charge of a capsule collection that will

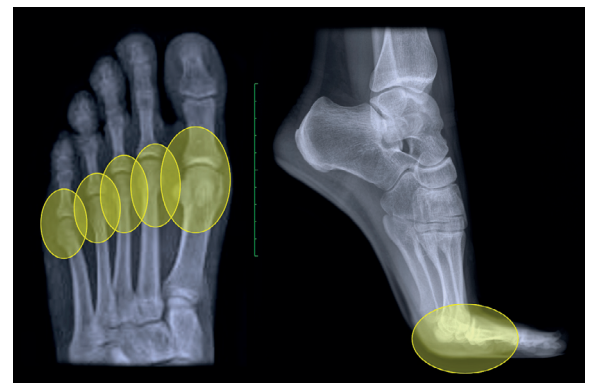
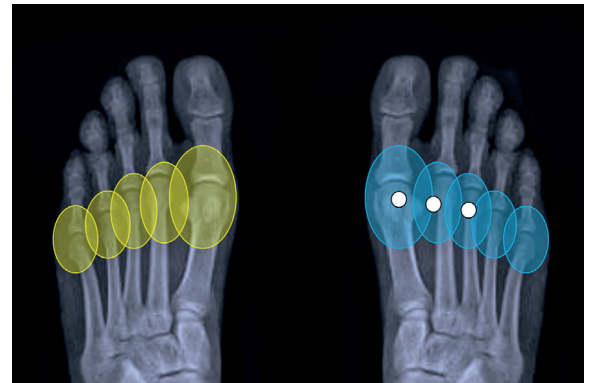
include the device and which is scheduled for this spring. He says that at first he was rather sceptical but then realised the device did not affect the aesthetics of the shoe and was really revolutionary. "Technology is often seen as being ugly when applied to fashion but this device does not change the style of a shoe. It offers comfort and balance, better cushioning, less pain and you don't see it."

Marcello Benetti, Global Head of Legal at Gait-Tech is equally confident as to the value of this development and says, "To us, the massive disconnect between the feminine, sensual aesthetic of high heels and the physical pain they cause women was maddening. With technology doing such brilliant things in the 21st century it was simply unreasonable not to find a solution to this. This vision led to the development of Gait-Tech and we're thrilled to offer it to the women of the world." If the device works as well as the company claims and there is no reason to think that it does not, there will be a huge number of women around the world who will thank him. The following images show how the device works.■

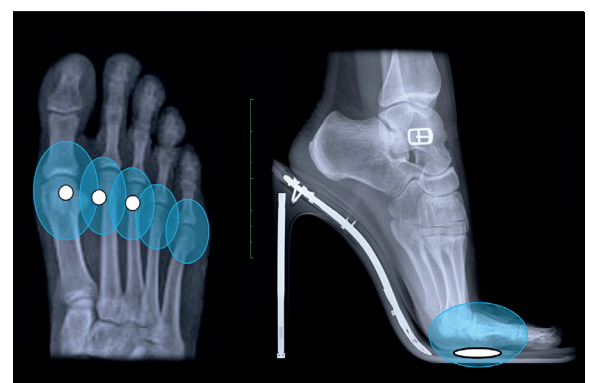
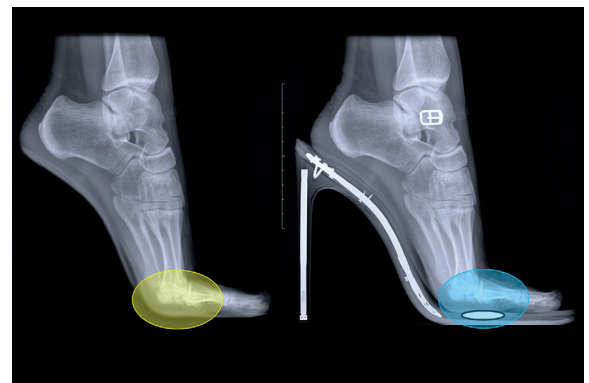


Views of device insert (top) and underside of insoles.

PROBLEM AND SOLUTION



Yellow areas show the five metatarsal heads of the foot and forefoot pressure peaks. Blue indicates biomech device cushions integrated into the insole.



Side view of the five metatarsal heads of the foot and forefoot pressure peaks. Blue shows the physical end result of the integrated biomech cushions.



CREDIT: MUNICH TRADE FAIRS LTD.

Prize fighters

The ISPO events in Munich have re-emerged in changed forms since covid-19. The pandemic brought major disruption to ISPO Munich and OutDoor by ISPO in 2020, 2021 and 2022, prompting important changes to the timing and format of both events.

ISPO Munich moved from January or February to November, starting with the most recent edition of the exhibition in November 2022. OutDoor by ISPO's dates are also to come forward in the calendar to early June in 2023 and 2024, eventually settling into a May slot in 2025.

On announcing these changes, organisers, Messe München, also presented a revised format for the ISPO Award. They said: "The ISPO Award is breaking new ground with a modernised concept. From now on, the award will be presented all year round; winners will be selected and announced throughout the year."

Companies will be able to choose when to submit their entries, with deadlines each quarter, rather than wait almost a full year, as they sometimes had to do in the past, to show off the innovations they had engineered into their products. The judges' panel will meet every three months, assess the entries that come in and

A revamped format for the ISPO Award programme has given footwear its own category. In 2022, 12 different shoe, boot and footwear technology ideas were among the winners.

name the products that win an ISPO Award. Winners will have the choice of being part of the Awards Gathering, a dedicated display of new trophy-takers, at either of the two exhibitions, choosing which show and which time of year suit them best.

In 2022, the first year in which the new format applied, a total of 95 products received an ISPO Award. In 2020, there were 42 'gold' winners and a further 51 shortlisted products. The overall numbers were, therefore, similar, but the revised 2022 format was clearer, with the categories better defined. And while shoes and boots have won plenty of ISPO Awards in

the past, they were spread out among broader categories whereas in 2022, for the first time, footwear was a category in its own right.

Twelve impressively diverse footwear products claimed a place at the 2022 Awards Gatherings and this article's purpose is to capture some introductory information about each of them.

Mountain merit

Swiss brand Scott Sports was among the winners for its Cosmos Re-Source ski touring boot. The judges scored the boot highly because 92% of the plastic parts it contains derive from biomass rather than from fossil fuels and because the power-strap is 100% recycled. Another ski boot to feature among the prizes was the Fischer One & Two Alpine boot for children, which has a hook-and-loop fastener, waterproof gaiter and lightweight shell as its standout attributes. There was a further winner representing children's cold-weather footwear in the shape of the Megapito winter boot from Finnish brand Reima. The panel liked this product's reliable protection from temperatures of minus-30 degrees in a lightweight, flexible, child-friendly design.

Still in the mountains, Scarpa's Phantom 8000 Thermic HD boot was among the winners. The boot is technically constructed and designed for high altitudes, hence the reference to 8,000 in the name. It is designed to keep the feet warm via two removable heated inner soles, but also to protect other muscles from cooling down with high-closing gaiters. Mountain brand manager at Scarpa, Francesco Favilli, has explained that stopping a climber from shivering means the risk of injury is reduced and performance and safety improve. Stimulate better blood flow, he said, and shivering stops.



The Cosmos Re-Source Ski Boot from Scott Sports.

CREDIT: SCOTT

“The ISPO Award is breaking new ground with a modernised concept. From now on, the award will be presented all year round; winners will be selected and announced throughout the year.”

One brand, four awards

One brand, Merrell, picked up no fewer than four winner's trophies. One of these was for a hiking boot called Rogue Hiker, which the brand presents as being ideal for backpackers because it has a high level of grip with its Vibram Megagrip sole. However, the boot is light in weight and 953 grammes per pair, which led the ISPO Award judges to say it feels like a trail-running shoe. This is not a coincidence because Merrell developed the Rogue Hiker using a trail-running shoe last rather than a traditional boot last.

Merrell also won for another version of this boot, the MTL Thermo Rogue 4, which is designed specifically for winter hiking. It will come to market in the third quarter of 2023. The brand describes this product as “a lightweight, sporty winter boot with robust features”. These robust features include a Vibram Arctic Grip outsole and Gore-Tex upper. MTL, which stands for Merrell Test Lab, is a tag that the brand applies to shoes that have come through its in-house incubator programme.

The third product in Merrell's quadruple win was the Agility Peak 5 ultra trail running shoe, which supports the current trend of fast hiking, the brand says. It has a high level of cushioning in the midsole and a Vibram Megagrip sole for traction. Senior brand manager,



Merrell received four ISPO Awards for its innovative shoes.

CREDIT: MUNICH TRADE FAIRS LTD.

Nathan Buelow, has said Merrell is thrilled to see increased participation in trail running and said he hoped a shoe like the Agility Peak 5 would convince even more runners to try the trail.

Trail running was also the focus of its fourth award-winning product, the MTL Skyfire 2. In this shoe, the brand is aiming for “technical sophistication” in a lightweight construction. Its lightweight materials (200 grammes per shoe) reduce fatigue while a plated midsole provides stability.

Forward running

Running shoes from other brands were among the ISPO Award winners as well in 2022. On’s Cloudmonster has what the judges described as a “strikingly thick sole”, which they liked because of its cushioning and its unusual look. Other features include high damping of vibration, a strong rebound, a high level of breathability and its use of quick-drying recycled materials.

Berlin-based brand Winqs won for its Zerofly running shoe. Winqs is on a quest to move the athletic footwear sector away from petroleum-based plastics and strategic overproduction and into plant-based and recycled materials. The outsole is made of hybrid rubber and was developed



The On Cloudmonster
CREDIT: ON

with Michelin from rubber waste. The particularly lightweight Pebax midsole is made in part from castor seeds. For the inner lining, Winqs relies on bio-based Tencel derived from wood pulp. The shoe’s two-layer upper also features a thin layer of 100% recycled polyester.

Good balance

Adidas and partners also featured, with the Terrex Free Hiker XPL Gore-Tex Parley boot, which, according to the judges, strikes a good balance between functional outdoor footwear

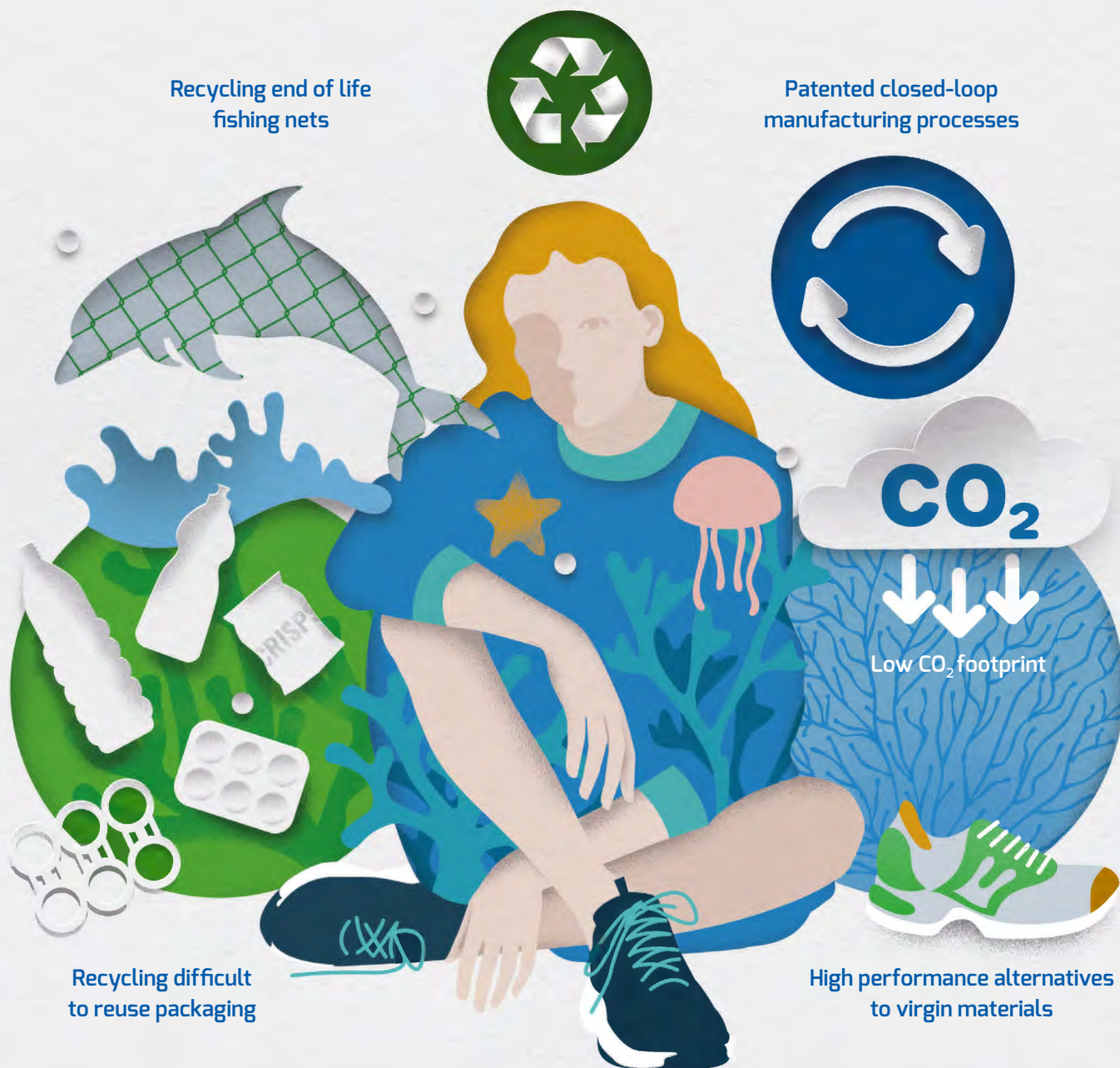
and urban design. It is a lightweight, waterproof hiking boot that uses fibres recycled from ocean plastic and an ePE membrane from Gore-Tex.

Finally, among the footwear winners is InsoleFinder, a software tool from Hamburg-based Currex, which is aimed at end consumers and at specialist retailers. The software application involves motion analysis of the foot and picks out the insole that will work best for participants in ten different sports, including running, hiking, football, cycling and tennis. ■



Shoes from Berlin-based brand Winqs. The company wants to move athletic footwear away from hydrocarbon-based plastics.

CREDIT: WINQS SPORTS



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Fast getaway

The external heel cage flexes during step in, then pops back into place.

CREDIT: KIZIK

It is a truth universally acknowledged that in a household with children, one can be certain to find the following: dried toothpaste in a bathroom sink; a soft, two-month-old apple in the bottom of a backpack; and many, many crushed-heeled sneakers thanks to hurried kids too impatient to fit their whole foot into the shoe.

A new line of hands-free shoes for kids might change that last one. Helped by the completion of a \$20 million Series B funding (led by the Newcastle Network), a Utah-based company has just launched Kizik Kids, which follows the success of an adult version of the shoes that can be stepped into with no kneeling, tugging or lace tying.

Since first launching with just two men-only styles in 2017, Kizik has since vastly expanded its offerings to include a range of styles for men and women. The brand has grown quickly (*Forbes* reported a tenfold year-over-year sales increase in 2021), while garnering praise from not only busy adults who enjoy a speedy exit from the house but from groups like pregnant women and people with disabilities who find the act of putting on a traditional shoe to be difficult or even impossible. Now children as young as four can enjoy the same ease and autonomy.

With the launch of a hands-free children's footwear line, Kizik's signature collapsible heel has simplified the act of putting on shoes for all ages and abilities.

The springback heel

The new kids line employs the HandsFree Labs (Kizik's parent company) shoe-entry technology already seen in the original adult shoes, which Kizik CEO Monty Deere describes as "patented tech that allows the wearer to simply step into the shoe, and the spring-back heel pops into place and stays there".

A shoe that does not require manual dexterity seems a natural fit for children, which begs the question: why wasn't this line launched first? "Offering kids' shoes was always the plan," Mr Deere tells *World Footwear*. "We started with adult styles because we wanted the largest demographic of consumers to be the first to experience the original hands-free shoe. We knew that once they did, they'd champion the cause for the kids in

their lives, and that's exactly what happened."

The new children's shoes come in more vibrant colour combinations, and the younger kids' sizes also have stretch laces so the top of the shoe flexes on step-in and the laces do not come untied. The response so far has been strong, with some styles selling out within days. Because kids can put these shoes on all by themselves, Mr Deere says, "this launch satisfied a lot of demand. Parents know the struggle of trying to get shoes onto their kid's feet so they can get out the door."

That springback heel is the heart of the Kizik design; it allows the shoes to bend momentarily as the foot presses in, then almost instantly re-assume their original shape once they are on. The concept aims to remove all the effort from putting on a shoe; wearers should no longer have to squat to loosen laces or tug the heel tab and manually manipulate the heel counter around the back of the foot.

Mr Deere tells *World Footwear* the company has more than 150 patents and patents pending on its footwear technologies with "with many different shoe-entry modalities" developed by in-house engineers under the direction of Kizik Founder Mike Pratt. Currently, three of those designs are used.

The first is the brand's original technology, which Mr Deere says is "created with a titanium/nickel wire inside of a plastic band that attaches to the sole of the shoe in sort of a rainbow shape. The titanium is a thin, low-profile material that flexes like a car antenna as we build the heel of the shoe around it, and that tension plus the high rebound in the titanium makes it so that it's always trying to pop back up." That approach is currently used in two styles, the canvas and suede Prague and the leather Vegas, which from the outside look relatively indistinguishable from other stylish trainers available on the market today.

The second, as seen on the Athens, highlights the brand's signature feature by putting the technology on the outside of the shoe. "Our most visibly distinguishable tech is the external heel cage," Mr Deere says. "It's a unique, compressible lattice structure that has become a Kizik icon."

The third design in use is an internal cage on two other styles, which is covered by the upper and not visible.

“ *This launch satisfied a lot of demand. Parents know the struggle of trying to get shoes onto their kids so they can get out the door.* **”**

MONTY DEERE, KIZIK

"While it looks similar to the external cage on the Athens, it has more geometry to it with more ribs of plastic making up the lattice structure, and its response on the bounce-back is softer," according to Mr Deere.

A shoe for everyone

On the company's website there is an interview with a woman effusing about how much she loves her hands-free shoes. "I have a ton of shoes in my closet," she says, "I don't wear any of them anymore because Kiziks are so easy to put on and are so comfortable." Like her, many of the brand's customers are drawn to the time-saving convenience of the shoes. (This reflects Mr Deere's philosophy: "It's about the joy — the satisfying convenience — that we don't have to stop what we're doing to untie our shoes, bend over, and put them on again.")

But for others, the shoes truly can be transformative. Mr Deere says customers have told him they have been unable to put their own shoes on for years. His brand "solves a fundamental life challenge in a very simple way and that resonates with everyone, but it's actually life-changing for some".

From an adaptive perspective, "any health challenge or condition or situation that makes it hard to bend down or hard to use your hands, whether that's pregnancy, aging, or a disability" can benefit from the handsfree approach, he says.

If the name Kizik is new to you, the technology probably is not. Three years ago, Handsfree Labs announced a strategic investment from, and an intellectual property licensing partnership with, Nike. At the time, Nike described the megabrand's FlyEase



The Anaheim, part of Kizik Kids new line of hands-free shoes.

CREDIT: KIZIK

platform as “providing greater access to sport for all athletes” and said it believed HandsFree’s technology could “broaden and enhance this effort by removing barriers to play and making sport easier for more people”. FlyEase was developed with insights from the disability community, according to Nike, and includes several variations including the Glide FlyEase (worn by US Team members in the 2021 Tokyo Olympics) and a high top Air Jordan 1 High FlyEase.

Though the two brands are not necessarily marketed to the same groups — FlyEase tends to emphasise its accessibility for athletes with mobility challenges while Kizik highlights the shoe’s day-to-day convenience as much as its accessibility — the limited availability of some of Nike’s hands-free models can be credited with introducing new consumers to the lesser-known brand. For example, when the Go FlyEase sold out swiftly after its release only to reappear on the resale market for grossly-inflated prices, numerous publications covering the shortage talked about Kiziks as an alternative.

In fact, about a year ago, Chris Chase, cofounder of independent review site WearTesters.com, ran a video review about Kiziks, acknowledging that the brand was not typical of the bigger names they normally cover (“Something very different for today’s video as this one isn’t for ‘sneakerheads,’” he said), but he felt it was important to introduce the shoes to what is often a brand-obsessed consumer set.

Focusing on the Kizik Athens, he began his review by referencing an earlier video about the Nike Glide FlyEase. While he had spoken highly of the Glide in a general sense, Mr Chase recalled, he had held one lingering concern: The Glide’s recycled foam insole “had no sock liner on it so it was just the exposed foam,” which caused his socks to stick and his toes to have to inch his whole foot forward. “It defeats the purpose of that being such an easy access type of shoe,” he said, “if I’m struggling trying to get into this thing.”

To Mr Chase, what made Kizik’s shoe truly hands-free was not only the collapsible heel but the Athens’ insole which he praised for being high-quality and having “a nice micro-fibery feel”, allowing his foot to glide in. “This is some comfort right here. We don’t even get this with

name-brand, expensive shoes.” (He went on to discuss the prevalence of big brands cutting corners for profit margin and the need for consumers to demand better from these larger companies.)

The WearTesters review also included insights from Ryan Jans, a writer for the site who has cerebral palsy. When asked to compare FlyEase models with the Athens, Mr Jans said it depends on the model. “The Flyease Jordan One with its zipper and strap system is a bit harder and takes more time for me to get on and off when compared to the Athens,” he said, “whereas the Go FlyEase, using the pop out heel midsole design, is slightly easier and faster than the Athens to get on and off.” Either way, he added, “I don’t have a hard time getting in and out of the Athens.”

At the close of the review, Mr Chase came back to the idea that for hands-free technology to make the life-changing impact it is capable of, the shoes must be consistently in stock and purchasable by the average consumer. “Everybody is too busy paying for [big brands] that they won’t go after something like [the Kizik Athens],” he said, “which is very readily available.”

What’s next for Kizik

The company is currently working on boots and launched a new hands-free shoe in early November called the Roamer on which the external heel tech — made with a proprietary foam — extends directly from the sole. The way the shoe’s design accentuates the springback heel as an aesthetic feature, rather camouflaging it, may hint at the brand’s growing popularity.

Thus far, Kizik has only been available online via the brand’s website, but that is set to change. In addition to launching Kizik Kids, part of the \$20 million in funding will go toward opening the brand’s first retail store in 2023 in Salt Lake City, Utah. And the company has plans to keep innovating — and protecting its innovations — in this space.

With the HandsFree Labs’ portfolio of granted patents and patents-pending, the company has “many ways to make easy-on hands-free shoes,” according to Mr Deere. “We will continue to develop and commercialise, and also protect and enforce, new footwear technologies.” ■

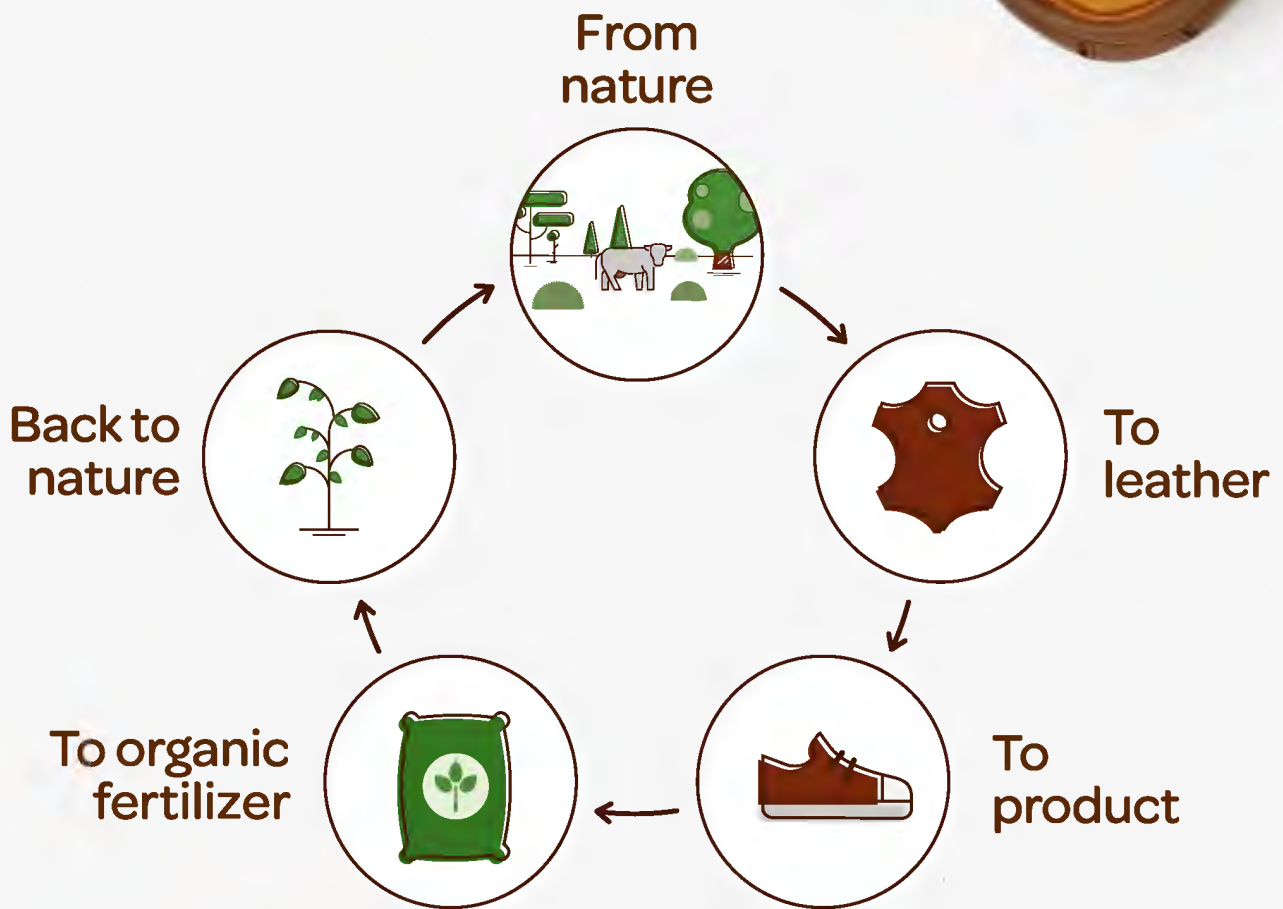
Nike uses hands-free technology in its FlyEase line.

CREDIT: NIKE





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Carbon-neutral safety shoes

Footwear brand U-Power claims to have launched, for the first time anywhere in the world, a collection of certified carbon-neutral shoes and boots for the safety and workwear market.

From the outset, U-Power made it clear in its claim that its production facilities in Paruzzaro in northern Italy still generate carbon emissions. It says its efforts to reduce these emissions are ongoing and, in this quest, it places considerable store on its efforts to use materials with reduced environmental impact. It accepts, though, that it is unavoidable for day-to-day operations at its factory not to have a carbon impact. It has, therefore, used offsetting to help it present the new collection, called Red Industry Green, as carbon neutral.

It is a busy business and was named in October last year as one of 35 stand-out exporting companies at the year's Export Capital Awards, an event co-organised by Italy's customs authority. These awards are divided by sector, with separate prizes for large and emerging exporters. In footwear and leather, U-Power took the award for emerging exporters; it was in exalted company, sharing the

Italian brand U-Power is claiming a world first, with a range of safety footwear that is certified as carbon-neutral.

podium with its counterpart in the large exporters' group, Gucci. The safety shoe company said it was pleased to be included among Italy's export leaders and paid tribute to the solid commercial relationships it has forged in key logistics locations, allowing it to reach customers across Europe.

Offering a carbon-neutral collection has involved a three-step process for Gucci's fellow-traveller. First, it set about measuring emissions at the Paruzzaro plant and then put in place a programme to reduce these. Finally, it identified environmental projects around the world and chose one it could invest in to offset the emissions it cannot eliminate from its own processes. It has used Certified Emission Reductions (CERs) for this,

“Climate-change affects everyone, U-Power has said, but everyone can bring about positive change, starting today.”

U-POWER



a type of carbon credit issued by United Nations-run carbon offset scheme the Clean Development Mechanism (CDM).

The project U-Power chose in this initial phase of its carbon offsetting programme is in Asia. It is a hydropower project on the Xe Namnoy River in the south of Laos. The Xe Namnoy 2 project is an important component of a renewable energy strategy that the government in Vientiane is pursuing, with the support of international development organisations and private investors. CDM has its own executive board, which has described Xe Namnoy 2 as “a renewable energy project that will produce positive environmental and economic benefits, and contribute to the local sustainable development”. It will supply renewable energy to domestic customers in Laos, but will also allow the country, which has the smallest economy in the region, to export energy to neighbouring Thailand.

Red Industry Green is a collection that consists of 12 different styles, ranging from lightweight clog-style sandals for applications such as healthcare to work boots for winter. Most, however, are sporty-style shoes. Natural, for example, is a work shoe with a soft, microfibre upper with “a high percentage of recycled materials”, according to the manufacturer. The company says the recycled material it uses comes from post-consumer-use plastic and is in keeping with the international voluntary standard GRS (Global Recycled Standard). It offers anti-slip, anti-bacterial, oil-resistant, electrostatic dissipative (ESD) and anti-puncture properties. It is particularly suited to logistics, automotive, assembly line and industrial working conditions, U-Power states.

The carbon-neutral shoes and boots in the Red Industry Green collection use a high proportion of recycled and renewable materials, but still meet all necessary safety requirements.

CREDIT: U-POWER.

A second style, Island, shares many of these characteristics, but has a knit upper with a high recycled polyester content. Its puncture protection is metal-free and also contains a high proportion, 59%, of recycled material. The collection’s Canyon shoe is similar, including its use of an abrasion-resistant sole constructed from polyurethane (PU) sourced from BASF, which the chemicals company presents as being “100% obtained from renewable resources”. The safety shoe brand makes references to this soling material offering enhanced protection from the cold.

In contrast, Niagara is one of the boot styles in the collection. It also uses the renewably resourced BASF PU in an insole that, according to the manufacturer, “supports the foot with an enveloping sensation of prolonged wellbeing”. Lining materials contain 66% recycled polyester and laces are from 100% recycled materials. The insole is anti-bacterial, anatomic and anti-static.

U-Power says it has been able to work with “lower-impact materials” and still meet all the same safety standards as previous collections constructed from conventional materials.

Climate-change affects everyone, U-Power has said, but everyone can bring about positive change, “starting today, beginning now”. ■



CREDIT: ADIDAS

New personal best

At first, a changing of the guard at Herzogenaurach seemed not unusual. When sports group adidas announced that then-chief executive, Kasper Rørsted, had decided late last summer, in mutual agreement with its supervisory board, to vacate his position to help facilitate a company-wide “restart” in 2023, macroeconomic challenges such as war in Europe and ongoing covid-19 lockdowns in the Chinese market gave the reasoning behind this decision an air of plausibility. This, despite the fact that Mr Rørsted had signed a contract extension with adidas, valid until July 31, 2026, only two years prior. What certainly was not expected at the time, by onlookers at least, was that Mr Rørsted would have departed the business by November 11, to be replaced by Bjørn Gulden, the leader of long-time adidas rival, and neighbour, Puma.

Taking stock

Adidas was originally founded by Adolf “Adi” Dassler out of his mother’s home during the early 1920s. After being joined by an elder brother, Rudolf, the Gebrüder Dassler Schuhfabrik (Dassler Brothers Shoe Factory) business was officially registered in 1924. The enterprise was known as Geda for short. Athletic footwear was the order of the day, beginning with leather football boots and spikes, the early, metal versions of which were wrought by hand in the family-owned workshop of a local friend, Fritz Zehlein. Momentum began to pick up speed after German runner Lina Radke wore a pair of Adi Dassler-developed, 152-gramme sprinting

As adidas embarks on its next chapter under the direction of a slightly surprising new chief executive, we take a look at why good sportsmanship will prove essential as the company navigates its next steps.

shoes with a goatskin upper, chrome-split sole and lacing down to the toe to win gold in the 800 metres during the 1928 Summer Olympics in Amsterdam. Mr Dassler collaborated with national athletics coach Josef Waitzer on the design, having struck up a friendship with the former Olympian based on their shared passion for enhancing athletes’ performance through footwear innovation.

All production took place in the Bavarian shoemaking town of Herzogenaurach, where the brothers had been born, raised and continued to live following their return from serving in World War I. Their father, Christoph, had also worked in a shoe factory. However, tensions between the pair escalated towards the end of the 1940s and ultimately drove them apart, leading to Geda’s closure in 1948 and the establishment of two separate, competing, companies. Rudolf Dassler set up Ruda (now Puma) that same



Bjørn Gulden (left), back at adidas after 24 years, is the son of former Norwegian international football and handball player Arid Gulden. Having played both sports himself at a high level, his own oldest son, Henrik, now plays in midfield for Norway's Mjøndalen IF football club.

CREDIT: ADIDAS

Mr Gulden says that new Puma chief executive, his former colleague Arne Freundt (above), is familiar with his strengths and weaknesses, adding another dimension to the already complex dynamic in Herzogenaurach.

CREDIT: CHRISTOPH MADERER

year, with his younger sibling entering the arena with his own firm, adidas, in 1949. Both trading names were blended from the first few letters of their founders' respective forenames and surnames.

As the story goes, the split would go on to divide the town's loyalties for decades. Roughly two-thirds of Geda employees, particularly those working in product development and manufacturing, were retained by Adi Dassler at the company's factory next to the town's train station. Those remaining, mainly sales and administration personnel, stayed with Rudolf at Würzburger Street. The river Aurach ran between their companies' headquarters, with the adidas factory in the north and Puma's to the south. The two brothers never spoke again. According to reports, locals' allegiance to one or the other brand went so far as to influence school-age friendships, the bars they would (or could) frequent and even their choice of spouse. Barbara Smit, author of *Pitch Invasion: Adidas, Puma and the Making of Modern Sport*, has written that Herzogenaurach consequently earned itself the nickname of the "town of bent necks", in reference to the habits of its townspeople, who would first look over a stranger's footwear before deciding whether to engage with them.

Although both brothers passed away during the 1970s, it would take a handshake and joint football match in September 2009 in support of the International Day of Peace, for employees of either firm to gather officially once again.

Nothing ventured, nothing gained

Adidas had launched its search for Mr Rørsted's successor in August. By early November, it began to emerge that the company may not have had to look very far. It was revealed that Mr Gulden, the chief executive of Puma since 2013, had chosen not to renew his contract with the company, but would instead allow it to expire along with his management board mandate on December 31 of last year. He still had a lot of energy and wanted to continue in an operational role for another five or even ten years, he said at the time, but felt "that would have been too long for Puma". That very same day, on November 4, adidas issued a statement which confirmed that talks with Mr Gulden were under way, with the view to making him Mr Rørsted's replacement. News then followed from Puma that a designated candidate, chief commercial officer Arne Freundt, an employee of over ten years, would take



over from Mr Gulden on January 1. "He knows my strengths and weaknesses and I am sure he will do an even better job than me," the outgoing boss said of Mr Freundt's appointment.

November 8, a Tuesday, brought fresh energy to the previous week's story. In quick succession, adidas made public its decision to name Mr Gulden its next chief executive and Puma made Mr Freundt board chairman and chief executive with immediate effect. It was subsequently announced that Mr Rørsted would be leaving adidas on November 11, with chief financial officer, Harm Ohlmeyer, taking the helm until Mr Gulden's January 1 start date. Chairman of the company's supervisory board, Thomas Rabe, welcomed the incoming senior leader, who had previously served as senior vice-president of apparel and accessories at adidas from 1992 to 1999, back into the fold, praising how he had "reinvigorated" the firm's close rival in recent years. Mr Rabe said that the board was convinced Mr Gulden would lead the business "into a new era of strength".

Neither adidas nor Puma remain under Dassler ownership today. The latter was first to go public in 1986, joined by the former in 1995. The first signs of any kind of crossover at a senior level came when a grandson of Rudolf, Frank Dassler, ruffled feathers by becoming group general counsel at adidas in 2004. On his retirement in 2018, he became the final representative of the founding family to step away.

A game of two halves

The first weeks of the new year have had their ups and downs for adidas and, by extension, Mr Gulden. The company's media relations team told *World Footwear* in January that its new leader did not plan on speaking to journalists ahead of a press conference to discuss the

The adidas headquarters are home to an Adi Dassler workshop, meaning the company's original shoemaker is never far from view.
CREDIT: ADIDAS

company's full-year results for fiscal 2022 on March 8. Yet, the loss of a stripe-heavy trademark infringement case against designer Thom Browne in a New York court on January 12, followed by a days-long hoax email saga involving activists The Yes Men and the Clean Clothes Campaign during Berlin Fashion Week, in which adidas was variously accused of poor labour relations and falsely celebrated for the staged appointment of "a Cambodian former garment worker" to the position of co-chief executive alongside Mr Gulden, meant that the business garnered plenty of headlines nonetheless.

For such a major industry player to cross the Aurach to rejoin adidas means positive attention has inevitably come, too, along with a degree of one-upmanship over Puma, at least for now. The first adidas-made football kits for Italy's national teams debuted at beginning of January this year as part of a landmark deal with the Italian Football Federation; this had been Puma's sponsorship domain since 2003. Later that month, doors opened to the first-ever adidas Home of Sport concept store in Asia-Pacific, located in Seoul's Myeong-dong shopping district. The approximately 2,500-square-metre location houses all adidas brands, including Originals, Terrex, Y-3 and Performance. What is more, the business revealed its first new label for half a century, adidas Sportswear, on February 2.

Local and market dynamics aside, one thing is already crystal clear. Former professional football and handball player Mr Gulden will certainly be kept on his toes as he moves to raise adidas, and his own career, to new heights. ■

No compromise. Hides from Braford cattle on Pampas pasture land in Rio Grande do Sul meets Veja's environmental and sustainability requirements.

CREDIT: SHUTTERSTOCK/DANIEL BASTOS

Veja's 180-degree turn

Footwear brand Veja has had something of a change of heart on leather. Last year, the Paris-based brand published a detailed report on its carbon footprint. It said that the raw materials it uses to make its shoes contribute 71% of its total carbon footprint. It went on to say that leather accounts for 97% of the impact of all of its raw materials.

Based on this, Veja said it had decided to reduce the presence of leather in its collections. It pointed out that, while 70% of the shoes in its autumn-winter collection in 2019 contained leather, the corresponding figure for autumn-winter 2020 was 51%.

In its calculations, it found that 70% of the carbon footprint that it attributes to leather occurs upstream in the supply chain, mostly from cattle farming. It attributed the remaining 30% to leather production and transportation. We argued in an article in our Leather and the Circular Economy section in our sister publication *World Leather* (August-September 2021) that it was unfair for Veja to attribute to leather such a large carbon footprint from cattle farming and that its figures for leather production and transportation also seemed implausibly high.

To its credit, the company responded to questions and shared a generous amount of information in its attempts to explain its numbers, but it also seemed slightly aggrieved at our unasked-for analysis and appeared determined to go ahead with its move away from leather.

Strong ties to Brazil

In truth, it was something of a surprise to learn that Veja would be one of the companies to feature on the

Since its publication of a carbon footprint report in 2021 that showed leather in a poor light, shoe company Veja has worked hard to improve its knowledge of the leather value chain, with encouraging results.

programme at the Sustainable Leather Forum in Paris in September last year. On the day, however, Veja's tone was positive and it was encouraging to hear it talk in detail about its supply chain commitments, including its ongoing commitment to sourcing leather.

Since 2004, when co-founders Sébastien Kopp and François-Ghislain Morillion decided to set Veja up, the brand's ties to Brazil have been strong. They set out to make athletic-style shoes in keeping with fair-trade principles and decided to use leather, organic cotton and natural rubber. Brazil seemed a good source of all three key materials and they began building up their relationships with suppliers in the South American country from there.

This includes manufacturing of the finished product, which they have put into the hands of partners in the southern state of Rio Grande do Sul. It established its ties to its main partner there in 2013 and, even though growth has led it to enlist the help of other shoe producers in the same part of Brazil, it still entrusted around 60% of its total output to the original factory in 2020, and Brazil is still the country of origin of all of its shoes.

Fair conditions

As part of its commitment to transparency, Veja has published comparisons it has made between the treatment of footwear factory workers in Rio Grande do Sul and their counterparts in south-east Asia, where, it points out, 95% of the world's sneakers are made now. Factories in Brazil offer a much higher social added value, the French brand has concluded. Factory owners respect the norms of the International Labour Organisation and the Brazilian workers who make its shoes have a 40-hour week, weekends off, a pension programme and four weeks' annual holiday.

Veja contrasts this with figures its research has thrown up of factory workers in China enduring shifts of 16 hours per day or more, a six-day working week and an hourly pay rate equivalent to €0.55.

Agricultural attitude

Co-founder François-Ghislain Morillion says he likes to think of Veja as "an agricultural brand" because it has always sought to work closely with suppliers who live and work in an agricultural setting and spends a lot of time with them.

It has 22 people working in its sourcing team, which is 22 more than it has working in marketing. It has six people working for it in Amazon regions to maintain its relationship with the growers of the *Hevea brasiliensis* trees that supply rubber for Veja soles. It has another four people in the north-east of Brazil who carry out a similar role with producers of the organic cotton fibre that goes into the laces and linings. Mr Morillion is proud of what this strategy has achieved so far. He says: "We started with small projects, ones that were just getting off the ground and, initially, we had, for rubber, 48 producers. Now we source our rubber from more than 1,200 families who have formed themselves into a collective. We don't buy from individual suppliers. We buy from the co-operative, which represents the families. This is part of our strategy of seeking to have the biggest and most positive impact possible on communities."

While the situation with cotton-growers is similar, the Veja co-founder admits that the brand has made less progress with the leather supply chain. "There are several reasons for that," Mr Morillion continues, "but one of the most important, and I'm not using this as an excuse, is that the leather supply chain is more complex and more opaque. Leather is a by-product of the meat industry and there are operators in the meat industry who would clearly rather not have us poke our noses into their affairs."

In spite of covid-19, it recently embarked on an exercise to try to put right this comparative lack of progress on leather. Its partner tanneries are in Rio Grande do Sul, too, and during a recent visit to those tanneries it attempted once more to go to the farms that raise the cattle whose hides end up in the leather Veja uses. What happened during those farm visits caused

initial concern at the company and probably confirmed some of the 'leave leather' sentiment that came across in the carbon footprint report. Curiously, though, in the end this experience led to much more positive outcomes for the brand's attitude to leather, with Mr Morillion even talking about a 180-degree shift.

Fuller engagement

He acknowledges without hesitation that if the brand's rapport with leather and the leather supply chain had fallen short of the closeness it has achieved in cotton and in rubber, the publication in 2021 of its carbon footprint figures did nothing whatsoever to improve the situation. "Yes, there was a bit of noise at the time," François-Ghislain Morillion says now, "because the people in the leather industry were not at all happy about what we published."

He goes on to say, however, that responses suggesting Veja had decided to end its use of leather overnight were unfair and inaccurate. Instead, he says the work the company did in preparing the 2021 report convinced it that, no matter how hostile the reception it had received from meat companies in the past, the new round of visits to tanneries and farms was essential because it realised that it had to engage more fully with its leather value chain.

Veja remains committed to pursuing alternatives, for example, making non-leather uppers by using the organic cotton fibres it already sources to make a canvas shoe-upper fabric and then coating it. "We want to develop our offering in this area," he says, "for customers who do not want to use leather. But we are committed to becoming better at working with our leather supply chain too and to get to know it better."

On home soil

To this end, Veja's impact and compliance manager, Ligia Zottin, who is from Brazil but is based at company headquarters, travelled back to her homeland to try once again to gain in-depth insight into leather. In the course



From the outset Veja decided to use natural rubber, organic cotton and leather in its shoes and identified Brazil as a good source of all three key materials.

CREDIT: SHUTTERSTOCK/SYLVIOBI

of this, Marlon Backes, a leather expert that Veja employs in Rio Grande do Sul, joined her on a visit to a cattle farm in the interior of São Paulo state.

Everything began well, with the family that ran the farm delighted that someone had travelled all the way from France to see their operation. "They showed us how efficient the process was, with the animals being born and raised on the farm," Ms Zottin recalls, "and just when we decided we had seen enough, we noticed that there were 20 or 30 animals that were different from the others. We asked why and the farmer told us they were animals that had just arrived from Altamira." This stopped the Veja team in its tracks. For Brazilians, Ms Zottin explains, Altamira, a place in Pará state in the far north-east, is closely associated with deforestation.

"And at that moment," she explains, "we decided we could not continue sourcing from this region because there was a risk. We were hiring people in the Amazon because we want them to talk to families there and explain we are committed to forest protection; it did not make sense to continue buying hides from a region where there was this risk of contributing, indirectly, to deforestation."

But all was not lost. Tipped off about cattle with zero-risk being linked to deforestation there, the team decided to start sourcing hides from the far south-east of Brazil and from Uruguay instead. Veja staff in Rio Grande do Sul began an exercise of not just buying hides from the south-eastern part of the state, close to the border with Uruguay, but to get to know some of the farmers as well. One relationship, with farmer Victor Wortmann, has blossomed to such an extent that he joined the Veja team on stage at the Sustainable Leather Forum in Paris.

Pride of the Pampas

Mr Wortmann farms at a ranch called Estância Coxilha, not far from Quaraí and the border with Uruguay, 600 kilometres south of Porto Alegre. The land here in the far south is part of the Pampas, the fertile grasslands that cover this region, part of Argentina and the whole of Uruguay. For almost four centuries, this land has been used as pasture for raising cattle. The only trees in sight are eucalyptus, planted relatively recently to provide shade for the cattle when the sun is at its fiercest.

Estância Coxilha specialises in Braford cattle, a cross between Herefords and Brahms, and Corriedale sheep. From birth to abattoir, these animals spend their entire lives on the farm, are 100% grass-fed and treated in keeping with all animal welfare requirements. "This gives us control," Mr Wortmann says, "and allows us to guarantee the origin of the meat, wool, hides and skins we produce." He leaves 90% of the land on the farm – into which he says you could fit half of Paris – completely untouched, making it a haven for fauna and insects of all kinds. The processes are regenerative, he explains, because the presence of the ruminants on the land, tramping organic matter into the ground as they move from place to place, leads to "constant regeneration of the undergrowth and enriching of the soil in a natural cycle".

Victor Wortmann represents the third generation of his family to lead operations at Estância Coxilha. His grandfather bought a first plot of land and founded the



After its carbon footprint report in 2021, Veja was a surprise participant in the Sustainable Leather Forum in Paris in September. Veja's impact and compliance manager, Ligia Zottin, speaking at the 2022 Sustainable Leather Forum in Paris.

CREDIT: SUSTAINABLE LEATHER FORUM

farm in 1959 and his father later took over. He says he approaches his work as "a mission to honour the history and the heritage" of the people in whose footsteps he is following. This means upholding their commitment to transparency, animal welfare, social issues and the environment, and to delivering meat, hides, wool and other by-products "that people can trust". Nothing bad can happen to this part of the Pampas while his family in charge, he insists.

Turn to the south

The ongoing Estância Coxilha project has made a positive impression on Veja. After meeting Victor Wortmann, hearing his story and visiting his farm, the footwear brand decided that it could and would continue to use leather and to source it from tanneries in Brazil provided it can use hides from farms such as this. "When you have people like Victor, working in the way he works," François-Ghislain Morillion says, "all you can do is tell yourself that you have to change from what you were doing before and move to this."

It was this that led Veja to make what he describes as its 180-degree turn on leather sourcing: no more sourcing hides in the central and eastern parts of Brazil because of the risks of being inadvertently implicated in deforestation. "We've never sourced hides in the Amazon, but when you buy from someone who buys from someone who buys from someone else, you can end up with material from the Amazon," he explains. "Working with farmers like Victor and others in the same region, you can see that the cattle are from European breeds that no one could raise in the Amazon biome because it's too hot there."

Veja has found a way of restoring faith in its leather supply chain by turning its gaze southwards. ■

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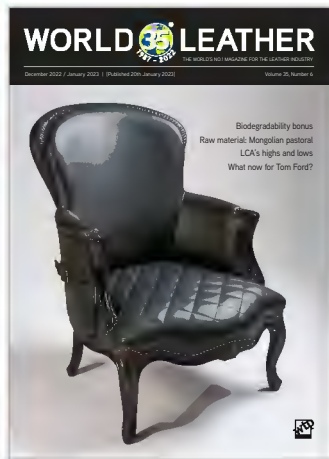
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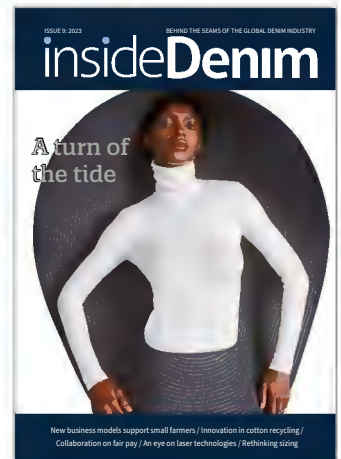
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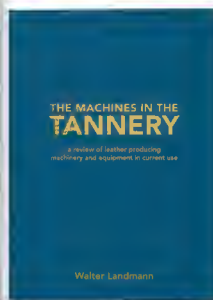
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