

WORLD FOOTWEAR

ISSUE THREE 2023 - VOLUME 37

THE GLOBAL SHOE INDUSTRY

Red Dot success for safety footwear

Impact calculator launches

Plasma potential

ABG's footwear strategy





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The award-winning Frontcourt Mid shoe from Puma Safety, produced by ISM Heinrich Krämer. It is one of four safety footwear products to have won prizes at the 2023 Red Dot Design Awards.

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Global news

Spain Shoe manufacturing town Elda, in the province of Alicante, hosted a footwear technology conference on July 12. The one-day event, Calzatic, took place in the José María Amat Amer Footwear Museum in the town. It included keynote presentations on the use of new technology in footwear manufacturing and on what the shoe industry can do to exploit artificial intelligence. Regional footwear industry body Avelca and the regional government of Valencia were the organisers, while digital technology developer Clavei sponsored the event.

Switzerland The European Outdoor Group (EOG) has released new data from its State of Trade (SoT) market research programme. The Switzerland-based group said sales of shoes, boots and other outdoor products in all categories had increased in volume and in value in 2022. The report puts the total value for 2022 at €6.1 billion, which represents growth of 11.5% year on year. The volume of units sold increased by 6.3% to almost 265 million items.

Norway Chess is the inspiration behind a new sneaker from Puma. Number one-ranked chess player and recent former world champion, Norway's Magnus Carlsen, worked with the sports brand to design the shoe, which is called the Magnus Carlsen x Puma Clyde Chess. The Clyde is a shoe that Puma launched in 1973, designed for basketball player Walt (Clyde) Frazier. The new sneakers are made with a premium leather upper that features a chessboard inspired texture, giving them "a unique and sophisticated look" according to Puma.

Denmark Danish footwear group Ecco has said that although it recorded a 30% sales jump in 2022 to €1.6 billion, its results were "not considered to be satisfactory" because profit was below pre-covid results in 2017-2019. Disruptions in the global supply chain affected production, resulting in slower deliveries to customers, compounded by "significant" increases in freight rates.

Namibia A Namibian charity that was established when the founder saw children walking to school barefoot in winter has donated 7,850 pairs of leather shoes this year, and is targeting 10,000 next year. Tim Ekandjo said Never Walk Alone aims to give every barefoot child a pair of shoes. The charity has donated shoes to schools in Hardap, Omaheke, Erongo, Kavango East, Kavango West, Khomas and Kunene.

South Africa The Southern African Clothing and Textile Workers' Union (SACTWU) has won above-inflation pay rises for footwear and leather workers. SACTWU signed two wage agreements under the umbrella of the National Bargaining Council of the Leather Industry of South Africa (NBCLI). SACTWU members in the footwear sector will receive a 7% wage increase. This settlement was reached after two rounds of wage negotiations with footwear employers represented by the Southern African Footwear & Leather Industries Association (SAFLIA).

Ethiopia Busan Economic Promotion Agency (BEPA) has invested in a footwear making facility in Ethiopia, with \$10 million provided by South Korea Official Development Assistance fund. The investment will build factories and train workers and officials to "enhance the competitiveness of leather and leather products industry". Dessie Dalkie, Ethiopian ambassador to South Korea, said Ethiopia's young workforce and access to raw materials give it a competitive advantage.

Canada A newly opened exhibition at Toronto's Bata Shoe Museum, "In Bloom: Flowers and Footwear", explores how the natural world has offered shoemakers "a source of meaning and material" over the centuries. The exhibition will run until October 2024. Highlights from the show include a pair of naturally dyed, "flower pot" pedestal platform shoes with an all-over cherry blossom motif from the time of China's last imperial dynasty, the Manchu-led Qing.

South Korea Singaporean shoe company Charles & Keith has inaugurated its first South Korean flagship. The two-story boutique, located in Seoul's Gangnam district, houses the brand's footwear collections on the first floor, above a curated selection of handbags, costume jewellery and sunglasses. Installations by local artist Park Ji Sun form part of the store's interior decoration.

US Materials developer Bolt Threads has announced that it has stopped making its Mylo mycelium-based product. In recent comments to *Vogue Business*, Bolt Threads co-founder and chief executive, Dr Dan Widmaier, said: "We have paused Mylo to reassess what works and what will work in the future." He confirmed that Bolt Threads had been unable to raise enough funding to take its plans for the material forward, in spite of high-profile projects with brands including adidas, Kering, Lululemon and Stella McCartney.



India Authorities in the country have approved a project to build a leather and footwear manufacturing cluster at Ratwad in the state of Maharashtra. The location is 130 kilometres south of Mumbai. The site has an existing industrial ecosystem with access to power, water and common effluent treatment plant infrastructure. It is also within easy reach of the port of Dhigi.

Singapore Seventeen footwear brands from Italy were among the companies that travelled to Singapore at the end of May to take part in an event called The Italian B2B Fashion Exhibit. This invitation-only event aimed to connect the Italian manufacturers to importers, distributors and retailers in Singapore and other parts of south-east Asia. Industry bodies Assocalzaturifici and Assopellettieri helped member companies to take part in the event.

Brazil Brazil-based certification Sustainable Origin, which certifies practices aligned with environmental, social and governance metrics in the footwear production chain, has grown by 75% in the past year, now reaching 100 footwear makers and their suppliers. Based on sustainability practices, there are 104 indicators in five categories: economic, environmental, social, cultural and sustainability management. According to a survey by footwear association Abicalçados, certified companies account for 45% of national footwear production, or 848 million pairs last year.

Bangladesh The Bangladesh Export Promotion Bureau (EPB) has reported leather footwear exports of \$644 million for the first 11 months of the country's current financial year, the period from July 2022 to May 2023. This represents a fall of 4.3% compared to the same period a year earlier.

Colombia The twenty-fifth Latin American Footwear Forum took place on June 22 and 23, in Cúcuta as the host city. This gathering brings together the national footwear associations of countries across Latin America. Countries represented this year were hosts Colombia, joined by senior people from the national footwear industry bodies of Argentina, Brazil, Chile, Guatemala, Mexico, Uruguay, Nicaragua, Venezuela, Ecuador and El Salvador.



Footprints

New chief executive for VF Corporation

VF Corporation, the parent group of Vans, Timberland, Altra Running, The North Face, Jansport and other brands, has announced that **Bracken Darrell** will be its new chief executive.

Mr Darrell takes up the role this July, moving from software developer Logitech International, where he has been chief executive since 2013.

He will replace **Steve Rendle** at VF Corporation; Mr Rendle stepped down at the end of 2022.

"Like millions of people around the world, I love VF's iconic brands," Bracken Darrell said. "I'm impressed by this organisation's sustained ability to keep its portfolio of brands at the forefront of culture. I look forward to working closely with the board, leadership team and the talented associates across VF to build on the initiatives under way to strengthen business performance and drive strong and sustainable growth. I can't wait to get to work."



CREDIT: VF CORPORATION

C-changes at Under Armour

Sports brand Under Armour has announced two new appointments to and two departures from its C-suite. It has appointed **Jim Dausch** as chief consumer officer and **Danny Miles** as chief technology officer. Those leaving to pursue other opportunities are chief operating officer, **Colin Browne**, and chief product officer, **Lisa Collier**, with the changes to take place over July and August.

Chief executive, **Stephanie Linnartz**, paid tribute to her departing colleagues and welcomed the new arrivals. On the subject of appointing a chief consumer officer, she said it would help "transform Under Armour faster by driving sharper focus and execution".

India appointment

Developer of open-cell foam technology for footwear OrthoLite has announced **Vikash Bajargyan** as the new general manager of its business in India.

He has 18 years' experience of the footwear industry and, before joining OrthoLite, worked for Coats Group, leading its footwear division across India and Bangladesh. Before Coats, he worked at specialist footwear materials developer Texon in Chennai for six years. Coats acquired Texon in July 2022.

In his new role, Mr Bajargyan will lead OrthoLite's manufacturing and business development in India, as well as establishing and managing relationships with footwear brands and tier-one factory partners.

Chief executive and founder of OrthoLite, **Glenn Barrett**, said Vikash Bajargyan would be the idea leader of the company's efforts to build new business opportunities "in this important region". Mr Barrett described India as "a thriving market both for the domestic consumer market and the export market, with tremendous potential".

CEO steps down

Outdoor group Columbia Sportswear has announced that **Mark Nenow**, president of its Sorel outdoor footwear brand, has resigned from his position on health grounds. Mr Nenow joined the company in 2007 to lead footwear. He became president of the Sorel brand in 2015 and developed collections of boots, sandals, sneakers and more. Chief executive, **Tim Boyle**, said Mark Nenow's leadership had been "invaluable to this company". The group announced that **Craig Zanon**, senior vice-president of its emerging brands, would lead Sorel while it searches for a replacement.

China choices

Luxury house Bottega Veneta has named **Dario Gargiulo** managing director for China. Mr Gargiulo, who officially assumed his new responsibilities this July, previously served in the position of chief marketing and digital business officer at the Kering-owned brand. He will be succeeded in that role by chief merchandising officer **Samuel Diep**. Before joining Bottega Veneta, Mr Gargiulo worked for Diesel and Missoni.

Also in China Puma has appointed **Shirley Li** as its general manager in China as part of the company's strategy to grow sales. Ms Li previously worked as vice-president of wholesale at adidas but joined Puma in March as commercial director. She replaces **Philippe Bocquillon**, who becomes area manager for China. Puma CEO, **Arne Freundt**, said: "I am very excited that we will open a new chapter under the leadership of Shirley."

On the money

Sports group Pentland Brands, parent company of Berghaus, Canterbury, Mitre, Ellesse and others, has appointed **Graham Burridge** as its new chief finance officer. Mr Burridge has more than two decades' experience in the

Senior appointment at Stanbee

Footwear components developer Stanbee has appointed **David Hapeman** as its new director of sales for North America. He will be based in the company's Portland office and report directly to chief executive, **Michael Berkson**.

Mr Hapeman was, most recently, general manager for the north-west for Coats Footwear, working with brands including Texon and Rhenoflex. Before that, he served on a number of leadership teams at Nike.

Speaking of the appointment, Michael Berkson said it would help Stanbee grow its global presence and continue to expand its line of sustainable products, which includes the Nitro Force heel counters and toe boxes, which are made from at least 85% recycled plastic bottles.

Group role

Footwear group Wolverine Worldwide has appointed **Chris Hufnagel** as group president with responsibility for leading and driving strategy across its portfolio of footwear brands.

In 14 years at the group, Mr Hufnagel has been brand president for CAT Footwear and for Merrell and was, until now president of its Active group of brands. In earlier roles at the group, he was president of direct-to-consumer business, corporate senior vice-president and head of strategy.

Switch at Converse

Parent group Nike has announced a new chief executive for the Converse footwear brand.

Converse's current chief executive, **Scott Uzzell**, is to become general manager for Nike in North America, with **Jared Carver** succeeding him in the lead role at Converse in June.

For the last four years, Jared Carver has been general manager of Converse in North America. In this role, Nike said he had "unlocked strong growth in the brand's largest geography".

Presidential visit

The president of France, **Emmanuel Macron**, visited the ASF 4.0 athletic footwear factory in Ardoix, south of Lyon, in mid-June. He said he wanted to show support for companies that had chosen to produce in France rather than in lower-cost overseas locations.

ASF 4.0 is a spin-off of textile group Chamatex. It has begun production at the factory and shoes it has made for Millet and Salomon will reach the market shortly. Shoes for Babolat will follow next year.

The production set-up uses high levels of automation; ASF stands for 'Advanced Shoe Factory'. Its ambition is to increase capacity to 250,000 pairs per year in 2024 and to employ 80 people.

K-pop appeal

Spanish luxury brand Loewe has named K-pop star **Lee Taeyong** as a new global brand ambassador. On making the announcement, Loewe said the singer had stood out for his dedication to style and his "passion for fashion". Within this, it said Taeyong had long been "a faithful follower of Loewe's artisanship and innovative design".

In formalising its relationship with the Korean star, it said he would help bring all the core elements of its autumn-winter 2023 collection to K-pop's huge audience. In terms of footwear, products that stand out in the collection include the Flow Runner athletic shoe in suede and nylon, and sliders in foam rubber. ■

consumer and retail sector, having held notable roles at advertising group WPP, Disney and Apple. He is a former chief executive of Disney Stores Europe.

Industry body

Multi-stakeholder body the Leather Working Group (LWG) has appointed **Debbie Burton** as its new director of marketing and operations. She was previously the director of marketing at leather and leather products manufacturing group Pittards. She will continue to serve as the volunteer chair of non-profit group Leather Naturally.

Tod's departure

Footwear group Tod's has announced that its creative director, **Walter Chiapponi**, will leave in September. Mr Chiapponi has been in the role since 2019 but will present his last collection for Tod's, a spring-summer 2024 collection, in Milan on September 22. The group said his departure would be "by mutual agreement". The designer said it had been "an extraordinary experience, personally and creatively" to spend four years at Tod's.

Family affair

French footwear brand Heschung has emerged from administration. A successful bid for the Alsace-based brand came from **Pierre Heschung**, grandson of the company's founder and entrepreneur **Philippe Catteau**. This means the footwear company's 65 employees will keep their jobs and its factory in Steinbourg, 50 kilometres north-west of Strasbourg, will remain in operation.

Focus on youth

The Young Entrepreneurs of Assocalzaturifici, the national association representing industrial shoemakers in Italy, has named **Federica De Pascale** as its new president. She takes over from **Elisa Lanciotti** and will remain in office until 2026. Ms De Pascale studied economics and business management and now works at Calpierre, the business her grandfather **Ciro De Pascale** founded in the 1960s. ■



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Industry & Innovation



CREDIT: DESMA

Sustainability measures continue at Desma

Footwear technology developer Desma has completed a project to put photovoltaic cells onto the roof of one of the buildings at its headquarters in Achim in northern Germany.

The solar panels cover an area of around 1,000 square-metres on the roof of production building C at the Desma site. The company said this would be enough to generate 85,500 kilowatt-hours of electricity per annum.

Desma will use this energy source in its own production processes, helping it reduce its carbon emissions. Managing director, Klaus Freese, said the project was part of a series of measures to become a sustainable business.

In 2020, Desma established a production operation it calls 'Factory of the Future', which has allowed it to increase productivity while reducing heating costs by 50%. It has also begun using particle dosing technology to enable the use of production waste, recycled materials or other fillers to reduce consumption of raw materials. It said this has made it possible for manufacturers using Desma machinery to produce footwear more sustainably.

Start-up investment

Chemicals group BASF has taken an investment in a Swiss start-up company called DePoly, a developer of chemical recycling technology. Founded in 2020, DePoly has developed technology that converts mixed post-consumer and post-industrial polyester plastic waste streams, including polyester-containing fabrics and fibres, back into their precursors.

Its claim is that the process delivers new precursors "at virgin-grade quality". In addition, it says its process is energy-efficient because it operates at room temperature and standard pressure. There is also no need for pre-sorting, pre-washing, or removal of contaminant materials.

The funding will enable DePoly to accelerate scale-up and development of its technology, leading to the building of a demonstration plant, which it expects to be operational before the end of 2024.

Puma announces commitment to LWG initiative

Sports brand Puma has signed up to the Deforestation initiative jointly established by Textile Exchange and the Leather Working Group.

Puma's head of sustainability, Veronique Rochet, said: "To mitigate the risk of biodiversity loss, Puma [will] use more sustainable materials. This deforestation-free commitment also directly supports one of Puma's sustainability targets dedicated to reducing our impact on biodiversity."

Distribution push

A new, approximately 110,000m² distribution centre in Ontario, California, is US fashion and footwear group VF Corporation's largest and "most efficient" to date, out of a total 46 units, the company has announced.

Now operational, the facility has capacity to ship 76 million pieces annually or 485,000 per day, limited to VF's Vans and The North Face brands initially.

Research revamped

Jihua 3515, a manufacturer of leather shoes based in the city of Luohe, in China's Henan province, has unveiled a new footwear research institute. Founded in 1951, Jihua 3515 specialises in the manufacture of safety and work footwear, as well as sports, outdoor shoes and formal styles. It has an annual capacity of more than 10 million pairs of shoes.

Hands-free

Seoul-based athletic footwear company Pro-Specs has released a new line of hands-free, slip-on trainers called Soft Wrap, constructed with new midsole cushions of the same name that, according to the brand, mean the shoes can be worn for longer.

Based on its own Fit Free system, Pro-Specs has built a shoehorn-like shape into the heels using 3D injection moulding to facilitate an easier on and off, without needing to bend or use one's hands. Breathable,

Midsole moves

Sports company Fila was able to produce 10,000 "sustainable midsoles" from 9,000 surplus footwear samples last year, according to its fourth annual sustainability report.

The document also discusses the implementation of a company-wide supply chain task force, as well as the establishment of "a new product circularity model", plus the introduction of near-field communication tags in several of its lines.

"Last year was particularly meaningful in that we further strengthened our mid-to-long-term strategies in all directions of sustainability management," a group spokesperson commented, reaffirming the business' commitment to continuing with its annual sustainability reporting.

Smart running shoes

Sports brand Li-Ning has paired up with fellow Chinese enterprise Huami Technology on what are being described as next-generation smart running shoes.

According to local media, two styles are due to launch in the third quarter of this year, after more than 12 months of collaborative research and development.

Wearables developer Huami is partly owned by consumer electronics company Xiaomi, which previously partnered with Li-Ning in 2015 on a running shoe collection designed to relay individuals' speed and distance based on chips in the soles.

This time, the chips have been specially engineered to collect and communicate data on runners' posture, gait and athletic activity. This summer's launches include an updated take on the brand's Liejun trainer, plus a whole new running shoe model.

Wool footwear on the rise

The Woolmark Company has said products such as the Supernatural Runner from Circle show that wool footwear "has come a long way".

According to the body that works to promote Australian merino wool around the world, sneakers with knitted wool uppers and other forms of innovative wool footwear are "on the rise".

It presented Circle's SuperNatural Runner as a good example, describing it as a light, durable and comfortable shoe that features a blend of merino wool and Tencel in the knitted upper and a 100% merino wool lining.

French brand Circle has said the upper provides support and flexibility, with the wool content aiding natural thermo-regulation. It used ProWeave technology from Texon (now part of Coats Footwear) to construct the knitted upper.

Regenerative leather

Capri Holdings, the parent group of Michael Kors, Jimmy Choo and Versace, has announced a three-year partnership with the National Fish and Wildlife Foundation (NFWF). The partnership is said to address the accelerated adoption of voluntary regenerative management and conservation practices in the US, where Capri sources much of its leather.

Expected to generate \$3 million "on-the-ground" conservation impact, Capri will fund the project with matching contributions through NFWF with the aim of improving 150,000 acres of US grasslands to drive a more sustainable future for the leather industry through advanced regenerative agriculture practices, restoring the health of critical grazing lands in the Northern Great Plains, Southern Great Plains and Rocky Mountain Rangelands.

Capri CEO John Idol said: "Our partnership with NFWF represents an extraordinary opportunity to tackle climate change and improve grasslands through a first-of-its-kind partnership between fashion and the nation's largest private conservation fund. We are proud to partner with NFWF to accelerate regenerative agriculture practices, improve biodiversity and drive positive environmental and social impacts in the leather supply chain." ■

stretchy knit uppers hug the ankle for a more comfortable and secure fit, enhanced by anti-slip injection rubber soles.

Baseline bonus

Athletic footwear brand ASICS has launched a limited-edition tennis shoe, in partnership with fashion brand Boss. The product is a limited-edition version of its Gel Resolution 9 shoe; ASICS and Boss designed it for Italian player Matteo Berrettini. It said the shoe would suit baseline players particularly well. It incorporates proprietary technology for extra lateral support and for stability and comfort on court.

World Cup innovation

This year's FIFA Women's World Cup, taking place between July 20 and August 20 in Australia and New Zealand, will see the debut of the first pair of Under Armour-made football boots designed specifically for female feet. The new model, called the Magnetico Elite 3 FG, follows much research and development into female biomechanics, in addition to feedback from athletes themselves.

Expansion project

Toray Advanced Materials Korea is to add 3,300 tonnes in annual capacity at its Gumi 4 facility for production of its Torayca carbon fibre reinforced thermoplastics (CFRTPs). The plant is in the city of Gumi, North Gyeongsang. When the expansion project is complete, probably in the second half of 2025, the facility's yearly output is expected to reach up to 8,000 tonnes of CFRTPs.

Material savings

The European Sporting Goods Industry Federation (FESI) has expressed concerns regarding the European Parliament's proposed ban on the destruction of unsold goods. FESI said that, while the destruction of unsold goods suitable for sale should of course be avoided, the current proposed scope remains unclear. "If we want to scale up the amount of recycled and recyclable materials in the EU, then recycling should not be considered as destruction," FESI said. ■

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Backtrack

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Spain gain in JD Sports' sights

05.07.23Additional funding for
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materials in July**30.06.23**

Vans goes from Old Skool to Knu Skool

29.06.23Coats, Texon and Rhenoflex unite
under Coats Footwear**28.06.23**

Bricks bring clicks in On's experience

27.06.23Messi-related shoes among June's
hottest Taobao searches**26.06.23**Adidas golf shoes get laceless look
without BOANew York accessories designer
reimagines the Forum Hi**21.06.23**Xtep to donate another ¥100m in
support of rural youths
Chinese exhibitors return to Riva Schuh
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companies in Italy**20.06.23**Wenzhou to hold its first 'shoe
culture week'Rockport files for bankruptcy
protection**19.06.23**Seoul to host Spanish footwear
exhibition next month
Textile Exchange and LWG join in
deforestation-free call**16.06.23**Webinar to explore benefits of 3D
shoe design tools**15.06.23**PrimaLoft reorganises European
sales team

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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.

14.06.23Evidence of ongoing high stock levels
Sourcing veteran bets on volleyball's
big hitters**12.06.23**Cordwainers award-winners
announced**09.06.23**Timberland carves out new role for
Archie McEachern**08.06.23**UK shoe restorer launches aftercare
subscription service
Four groups dominate US luxury
footwear market**07.06.23**Port deal must come soon, AAFA says
Beijing welcomes China's first Clarks
Originals boutique**06.06.23**European outdoor market passes
€6 billion in 2022**05.06.23**FDRA announces leadership changes
Capri confident of resilience in
luxury sector**02.06.23**Dr Martens is a billion-pound brand
Nike charts a more streamlined
path forward**01.06.23**Kenzo unveils first Nigo-
designed trainers**31.05.23**Record revenue for Jimmy Choo
New group president for
Wolverine Worldwide**30.05.23**Dr Martens owner branches out
Christian Louboutin designer boosts
sustainable leather panel**26.05.23**Hoka up almost 60% in fiscal 2023
Adidas and Prada launch football
boot collaboration**25.05.23**FDRA sustainability summit to
explore LCA concerns**24.05.23**Puma pushes suppliers to boost
renewable energy use
Recovering global economy boosts
new Clarks parent group
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for Foot Locker
Continued contractions at Vans still
'according to plan'**23.05.23**Cordwainers footwear awards adds
athleisure prize
Runners test Descente shoe ranges
at Seoul fun run**22.05.23**Step forward for adidas
Yeezy inventory**19.05.23**Nike to build 'eco-sports field' in
China's Yunnan province
Best quarter on record for On**18.05.23**Record year for Mizuno
Pou Yuen Vietnam lets go of another
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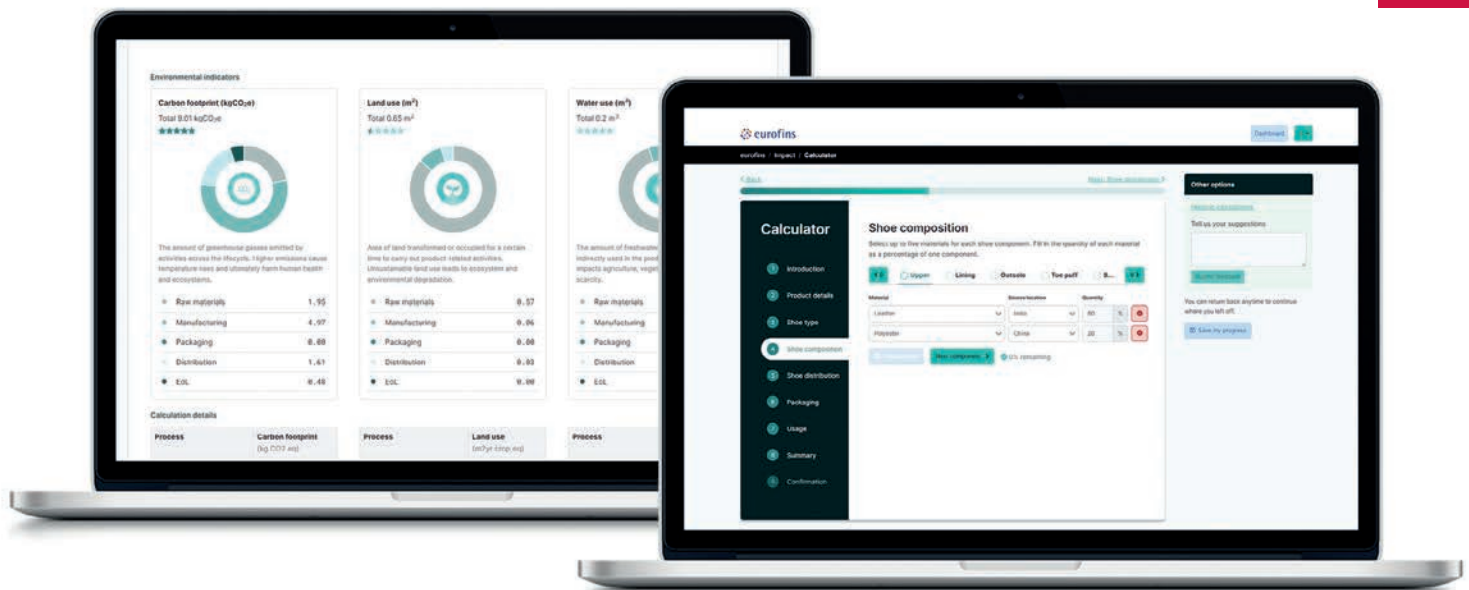
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Calculating footwear sustainability impacts

Dr Andrew Hudson, Eurofins BLC Leather Technology Centre

The manufacturing of footwear uses a high number of components and a wide variety of materials which are sourced from all over the world. As such, the entire life cycle of a footwear product from all the individual raw materials (cradle) through component and shoe production, consumer use and end-of-life (grave), has a significant impact on the environment in terms of carbon footprint, land use, water usage and much more.

In order to identify opportunities to reduce the environmental impact of footwear, the industry needs to be able to establish which parts of the supply chain make the biggest contribution. A key tool to enable an assessment of the overall supply chain is a Life Cycle Assessment (LCA) which is a science-based approach to gathering data specific to an item of footwear. Unfortunately, a full LCA is a typically expensive and resource intensive approach which can take many months to gather the data to provide sustainability insights. For these reasons, LCAs have not become mainstream and have been mainly limited to larger organisations assessing a relatively small number of specific styles of footwear.

To address these issues, a new Footwear Impact Calculator based on LCA principles has been developed which enables non-expert 'Users' to

undertake an assessment of a wide variety of footwear styles quickly and inexpensively. The output of the calculations provides meaningful and actionable data to identify areas for improvement.

Sustainability

A simple assessment of the number of different components and materials in any given shoe, along with considerations of the level of manual operations and locations of production and retail countries, shows that the manufacture of footwear is a resource-intensive industry operating within a truly global supply chain. As such, the sustainability impacts of the footwear sector in the context of the environment, society and governance (ESG) have the potential to be significant. Whilst sustainability is often considered only in the context of the environment, the reliance of the industry on labour-intensive manufacturing leads to the risk of creating labour exploitation, human right abuses and poor working conditions. Equally, good governance can only be achieved with robust systems and processes to identify, assess and manage ESG risks.

As the footwear industry extends from raw material extraction through manufacturing into consumer use and then repair/reuse/recycling and finally into disposal, understanding the sustainability

performance of a product can only be achieved by knowledge of impacts along the entire supply chain. The material and footwear manufacturing stages can often account for 70% of the overall sustainability impacts which demonstrates that it is not sufficient to only make improvements in areas under your direct control e.g. your own direct operations. It is also necessary to look at areas you can influence e.g. your supplier's operations and distribution channels.

Whilst many footwear brands have limited knowledge of their supply chain, legislation is driving larger companies to have full visibility back to the point of raw material extraction, make appropriate sustainability commitments and improvements and share this information with stakeholders and consumers. Examples of such legislation include the European Corporate Sustainability Reporting Directive (CSRD), the German Supply Chain Due Diligence Law and various USA 'Fashion Acts'. In addition to forcing industries to become more sustainable, legislation is also defining how environmental claims can be made and what is required to ensure that these can be substantiated. The proposed European Green Claims Directive is a key example of how governments will ensure that consumers are protected against spurious green claims and greenwashing.

Need to measure

Measuring the sustainability impacts of a material, product, operation or supply chain, is a key element of defining what the current situation is and how potential improvements can be made and communicated both within an organisation and to stakeholders, including consumers and investors. The proposed Green Claims Directive will look to introduce specific direction on how environmental claims can be substantiated which will centre on scientific evidence of claims linked to significant environmental improvements. As such, the use of credible science-based metrics (SBM) will be crucial in supporting any green claims that an organisation would like to make to their consumers.

Due to the supply chain complexity and diversity of footwear materials, the opportunities for actors within the supply chain to make significant environmental improvements is vast. Many organisations have chosen to focus on materials, either by selecting 'Environmentally Preferred Materials' (EPM's) or by ensuring use of the best versions of a specific material. Other brands have focused on increasing the use of recycled content or even using bio-based materials.

An alternative or additional approach is to consider other environmental impacts within the supply chain. Examples of these include optimising packaging (e.g. reducing or eliminating, use of recycled materials, etc) or moving from a global to near-sourced distribution model. Whilst each of these approaches many have environmental benefits, the real issue is whether these changes are significant and how the benefits can be comparably measured. The question also remains whether these individual strategies are addressing the biggest impact areas within the supply chain.

“Understanding the environmental impact within a footwear's lifecycle from cradle to grave is critical for the industry to be able to make meaningful and impactful improvements.”

LCAs

To identify the key environmental impacts within a supply chain, it is necessary to consider not only the shoe manufacturing process, but the entire process both upstream and downstream from this stage. Upstream impacts include those for the raw material extraction for each material used in each component, such as plastics and rubbers, animal-based materials, virgin and recycled textile materials, packaging and trim materials. Downstream includes distribution to the warehouse and retailer and then consumer use and final end-of-life (recycle/disposal). To identify and measure all these impacts, an approach called a Life Cycle Assessment (LCA) has been developed as a powerful tool by which organisations can assess the environmental impact of an item of footwear in the context of its entire life cycle. Such assessments provide insights into where the major sustainability impacts are and enable targeted and impactful improvement strategies to be developed.

Whilst full and complete LCAs can provide detailed insights, they have some significant disadvantages which prevent them from becoming a mainstream tool. The first issue is that LCAs require significant resource and time in gathering, assessing and calculating all the data that is required at each stage of the supply chain. The second key issue is that different approaches can be taken by different organisations conducting LCAs on similar footwear products which prevents direct comparisons between different footwear and footwear supply chains. The third issue, which arguably is the key drawback, is that LCAs can be very expensive.

Recognising the limitations in comparing LCAs, the European Commission has drafted Product Environmental Footprint Category Rules (PEFCR) to provide guidance on how the environmental footprint of footwear should be calculated. By defining which life cycle stages and processes should be included in the 'system boundaries' for footwear, organisations will be clearer on how to calculate an LCA and comparisons between different LCAs will be relevant (Figure 1).

Impact Calculator

Whilst the PEFCR makes comparison between LCAs possible, it does not overcome the relatively high cost of performing a full LCA which can take months and cost many tens of thousands of dollars. To address this, a new footwear sustainability calculator has been created

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which is based on the draft PEFCR and LCA principles as described in ISO 14040 and ISO 14044. This Eurofins Footwear Impact Calculator is powered by SimaPro (developed by PRé Sustainability) and has been designed as a low-cost and intuitive tool that allows a user to identify potential sustainability impacts for a whole range of footwear styles.

The tool is an online system which can be used to assess the entire supply chain of a finished pair of shoes including packaging. The product lifecycle scope is from cradle to grave, covering the production of materials and of the shoe, transport, use and end of life of the shoe. The tool uses a variety of secondary data sources including those from the PEFCR and ecoinvent version 3.8 life cycle inventory database. The product's end of life was modelled using the Circular Footprint Formula (CFF) developed by the European Commission as specified in the PEFCR.

The strength of the tool is that it does not require any LCA or sustainability expertise on the part of the user to obtain meaningful and actionable data. It guides the user through a simple process by means of drop-down menus relating to materials used in the construction of the shoe, manufacturing and retail locations (countries), retail channels (online and in-store) and levels of consumer wear (use). From this information, the tool estimates the three key environmental impact indicators for footwear:

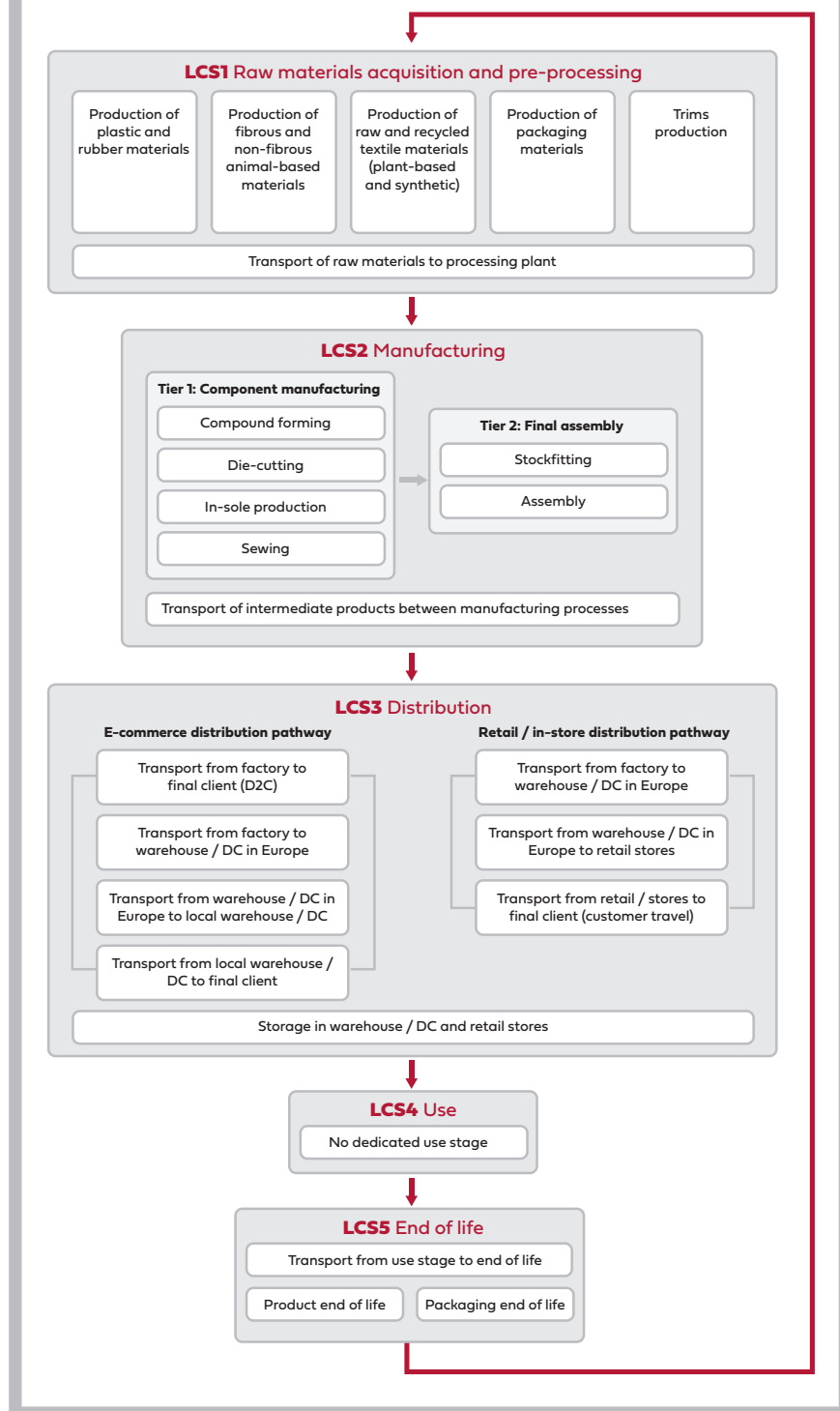
- Carbon footprint (climate change)
- Land use
- Water use

Within each of these a report is generated which itemises the top 10 contributing factors for each impact category within the overall footwear's cradle to grave lifecycle as shown in Figure 2.

The tool has been designed for two key types of user:

1. Users who do not have detailed Bills of Materials (BOMs) for the footwear;
2. Users who have detailed BOMs including weights of individual components (e.g. weight of the upper).

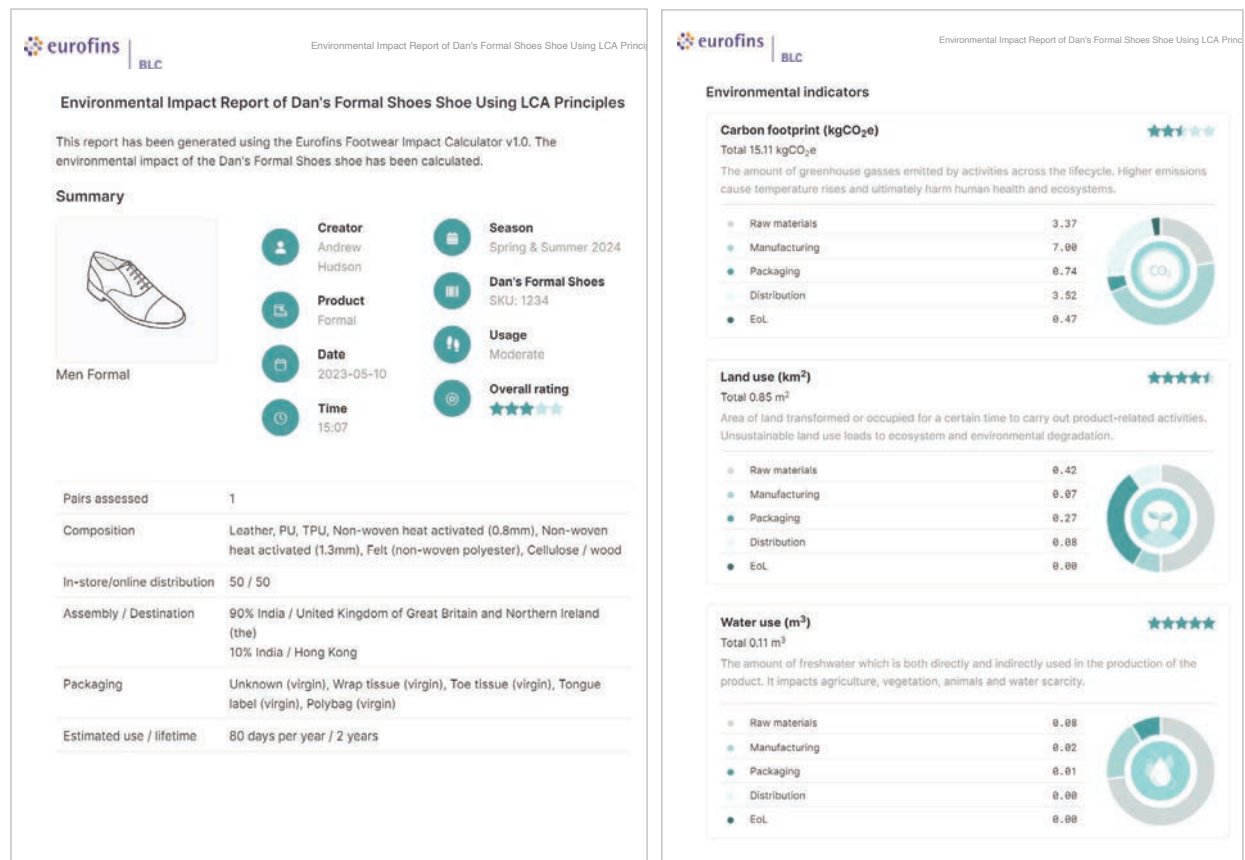
Figure 1: System boundary diagram for footwear per the draft PEFCR.



For those users who do not have detailed information, the tool has created footwear templates for a variety of men's, women's and children's shoes which has estimated the amounts of different materials that would be used for the various footwear components. By simply selecting, for example, leather as the upper, EVA as the

outsole, polyester as the lining, etc. the tool will calculate the impact values based on average weights of each material in each component. Where detailed BOMs are available, a Create Custom Shoe Type option will allow the user to input specific weights of each material in each component e.g. the upper is 78.3g of leather and 14.2g of polyester, the

Figure 2: Examples from a four page report form with itemised impacts for carbon footprint, land and water use.



outsole is 112.4g of EVA, etc. The tool will then estimate the environmental impacts very specifically to the shoe under review.

Using the calculator

It is important to understand that the results from the Eurofins Footwear Impact Calculator are derived from secondary data sources rather than data that has been collected specifically for the actual processes and materials used in the real-life supply chain (primary data). As such, results from the tool should not under any circumstances be used to make any sustainability claims.

The real benefit of the tool is that the results of the calculations can be used by brands, retailers, designers, technologists and sustainability managers to identify opportunities to target improvements in the areas of highest environmental impact. It is estimated that up to 70-80% of environmental impacts will be affected by choices made during the design phase. By using the tool as a method for screening different footwear styles, comparing different materials for each component and assessing the effect of manufacturing locations, the results can be used as a precursor for determining which aspects of the life cycle should be a focus. From this, primary data can be collected both prior to and after making product changes, the results of which can be used for sustainability claims.

Conclusions

Understanding the environmental impact within a footwear's lifecycle from cradle to grave is critical for the industry to be able to make meaningful improvements. LCAs use a science-based approach to collect and assess appropriate data to define such impacts and highlight potential areas of improvement. Whilst full LCA studies provide company-specific data, they can be costly and resource intensive. The new Impact Calculator tool offers the industry a pragmatic, inexpensive and rapid way to understand potential impacts within a supply chain based on the materials used in each component, manufacturing countries of both input materials and the footwear along with logistics, distribution channels and countries of retail. The output from such studies can be used for both determining where sustainability improvements might be made, but also where company-specific data should be sourced for before and after any sustainability improvements, the data from which can be used appropriately in consumer communications. ■

Disclaimer: Please note that results from the Eurofins Footwear Impact Calculator cannot be used for making sustainability claims. The tool provides an estimation of your environmental footprint based on LCA principles, but it does not replace a full LCA study. The calculator does not use company-specific data and therefore results are not PEFCR compliant. The tool has undergone internal verification at PRé Sustainability but has not been externally verified.



*Hydrophobic leather boot waterproofed
by plasma coating.*

ALL CREDITS INESCOP

Advancing functional materials through plasma technology

Carlos Ruzafa, Víctor M. Serrano and Elena Orgilés,
INESCOP Footwear Technology Centre

The footwear industry is continuously evolving, driven by the pursuit of improved functionality and performance in its products. In recent years, there has been a growing demand for durable hydrophobicity in footwear materials, as consumers seek shoes that can withstand various weather conditions without compromising comfort or style. However, achieving long-lasting water repellency has often required the use of treatments that raise concerns about chemical safety.

Recognising the need to address this challenge, researchers at INESCOP have turned their attention to plasma technology as a potential solution. Plasma, an ionised gas, offers unique properties that can be harnessed to develop advanced coating treatments for functional materials. Through its ongoing research, the organisation aims to revolutionise the footwear industry by enhancing functionality, improving chemical safety and promoting sustainability through plasma technology.

Enhancing water repellency

The research conducted so far aligns with the identified need in the footwear industry for chemical safety in treatments used to achieve durable water repellency. Many traditional methods rely on the use of chemicals that can pose risks to human health and the environment. By leveraging plasma technology, INESCOP seeks to develop coating treatments that

minimise or eliminate the need for such chemicals, offering a safer alternative.

Results thus far have been promising, particularly in terms of the hydrophobicity achieved in leather and textiles studied. Plasma treatments modify the surface properties of these materials, creating a protective barrier that repels water molecules. This innovative approach not only enhances water repellency but also contributes to the durability and longevity of the materials concerned, ensuring a longer lifespan for footwear that has received plasma treatment.

Plasma technology for coating

To develop the described coatings, plasma technology is optimised by adjusting different working parameters. Electrode power, deposition time, monomer flow rate and the choice of organosilicon chemical precursor (compounds that are key single-source precursors for the synthesis of a great variety of silicon-based materials) are carefully fine-tuned to achieve the desired results.

Electrode power plays a crucial role in plasma technology as it determines the energy supplied to the system. Controlling the power precisely makes it possible to optimise the coating process and achieve the desired properties. While higher power levels can lead to increased deposition rates, excessive power may cause damage to the material itself or result in undesired effects. Through rigorous experimentation

and analysis, INESCOP has been able to identify the optimal power range for each specific coating application.

Deposition time is another parameter that significantly influences coating properties. Longer deposition times allow for thicker coatings, which may enhance durability and hydrophobicity. However, there is a delicate balance to be struck, as excessively long deposition times can lead to over coating and compromised material integrity. Extensive testing is carried out to determine the ideal deposition time for each coating formulation, ensuring optimal performance without sacrificing material quality.

Monomer flow rate is also a critical parameter in plasma technology as it controls the supply of precursor molecules to the plasma chamber. Precursor molecules are responsible for the chemical reactions that occur on the material surface during plasma treatment. By carefully adjusting the flow rate, the concentration of these molecules can be controlled to ensure uniform coating coverage. This parameter optimisation is crucial in achieving consistent and reliable functional properties across different footwear materials.

The type of organosilicon precursor used is carefully selected based on its compatibility with the desired functional properties and material composition. Organosilicon compounds offer excellent water-repellent properties and can form stable coatings on various surfaces. INESCOP evaluates different precursor options and assesses their performance in terms of water repellency, chemical safety and material compatibility. This comprehensive approach ensures that the chosen precursor aligns with the industry's need for safe and effective water repellent treatments.

Promoting sustainability

In addition to addressing chemical safety concerns, the application of plasma technology offers significant potential for promoting sustainability. Traditional coating methods often generate substantial waste and rely on environmentally harmful chemicals. In contrast, plasma technology offers a more sustainable approach by reducing waste production and minimising the release of harmful substances into the environment.

Plasma treatments also comply with stringent regulations regarding chemical safety and environmental impact. As a result, the footwear industry can meet international standards while providing functional materials that are safe for consumers and the environment. By embracing plasma technology, footwear manufacturers can contribute to a more sustainable and responsible industry.

Unlocking new possibilities

Plasma technology for coating development offers new possibilities. By tailoring plasma treatments to specific materials and desired functionalities, manufacturers can create innovative footwear products with enhanced performance attributes. Beyond water repellency, they can improve properties such as breathability, abrasion resistance and colour fastness. This versatility allows footwear to be created that meets the evolving needs of consumers while also providing



Silane monomer plasma beam in low pressure plasma equipment.

superior comfort, durability and safety.

Furthermore, plasma technology can significantly enhance product performance and consumer satisfaction. Footwear that exhibits durable hydrophobicity and improved chemical safety not only meets consumer expectations but also provides added value. Whether it is a hiking boot, athletic shoe or casual sneaker, functional materials developed through plasma technology contribute to a more comfortable and pleasing user experience.

Tests have also been carried out on finished footwear with promising results. Plasma treatments applied to footwear materials do not modify the haptic properties of the shoes or the materials themselves. This ensures that shoes maintain their desired feel and texture, offering a seamless transition for consumers who value both functionality and sensory experience. In addition, product lifespan can be enhanced, reducing the frequency of replacement. This approach aligns with the industry's increasing focus on sustainability and circular economy principles.

Conclusion

INESCOP's ongoing research in plasma technology represents a significant step forward for the footwear industry. By addressing the need for chemical safety in water repellent treatments, it aims to provide innovative and sustainable solutions. The promising results obtained in achieving hydrophobicity demonstrate the potential of plasma technology in enhancing functional materials for the footwear industry. INESCOP believes that plasma technology has the potential to transform the footwear industry, revolutionising the way functional materials are developed and integrated into footwear products. It offers improved functionality, durability and environmental responsibility, so shaping the future of functional footwear. ■

**This research was funded by the Valencian Institute for Business Competitiveness (IVACE) of Generalitat Valenciana and the European Regional Development (ERDF), grant number IMDEEA/2023/61, NANO4COAT.*



White sneaker by Moral Code shows that contrary to some claims, Olivenleder can be used to produce white leather.

CREDIT: MORAL CODE



Avoiding the headache from glutaraldehyde

Glutaraldehyde (GTA) is an aldehyde that can be used as an alternative to chrome tanning. In July 2021, it was listed on the SVHC (substances of very high concern) candidate list due to its respiratory sensitising properties. This places certain obligations on suppliers of articles containing it at a concentration greater than 0.1% w/w (percent concentration of a material in solution) in that they have a responsibility to provide enough information to allow safe use of that article. Tanners producing wet-white, chrome-free and synthetically tanned leathers are among those most likely to be affected.

Some things in life come as a surprise. Many surprises, however, only occur to those who refuse to face reality. Thomas Lamparter from Wet-green GmbH in Reutlingen, Germany, can confirm that. He engages with many people in the leather industry including tanners, brand managers and designers. In some conversations, he says that he gets the distinct impression that the topic of GTA has seemingly fallen from the sky, surprising and threatening to disrupt the entire leather industry. There is a great commotion, outraged reactions and widespread consternation. While this may well be something of an exaggeration, he doubtless has a point.

Indeed, he also notes that the German automotive manufacturer BMW has a firm grip on this reality. Several years ago, the company realised that sustainability, 'Cradle to Cradle', increasing supplier responsibility and general awareness of environmental and nature conservation concerns were not just passing media fads that would soon subside. Instead,

these issues have steadily gained relevance in recent years. Year after year, brand communication is increasingly required to address these topics and provide reliable answers to a generation whose concerns revolve around the future of the planet.

The usual response to such questions is to create smokescreens. Flowery promises are made and fantasies of the impossible are concocted, all in the hope that no one will bother to look behind the screens. But often, the truth behind them is bleak. This calculation is becoming less successful as consumers are reluctant to be taken for fools. How else can one understand it when manufacturers promote a 'natural' tanning agent that claims to use olive mill wastewater (OMW) as a significant substance but when analysed in the lab also includes the addition of glutaraldehyde? These claims and their promotion are essentially just 'greenwashing'.

Sustainable alternative

However, Lamparter claims there has been a completely transparent, real and sustainable alternative available for over a decade in the form of wet-green OBE. A tanning agent developed by the German company Wet-green meets all the requirements of the modern leather industry and has nothing to hide. BMW was one of the first companies worldwide to explore this possibility beyond conventional chemical tanning agents. And has apparently met with great success. But it is not just the automotive industry that has caught on; the fashion industry is now using Olivenleder extensively.

“By using other by-products such as the pomace (filter cake) and the olive mill wastewater (black water), there is the potential to convert global leather production to being tanned with by-products from olive growing for a real circular system.”

THOMAS LAMPARTER, WET-GREEN



Renowned brands such as Hugo Boss, Alpha Tauri (Red Bull), Tricker's, Moral Code and Grenson have realised that leather cannot be treated as if advances in tannages have not been made. Patagonia, known for producing high-quality products that are both functional and durable, has been a pioneer brand in terms of sustainable practices and has a strong community of customers who support its philosophy. When developing its work boots, the company considered there was no alternative but to tan its choice of American bison hides with the patented OBE. Patagonia is a highly respected brand and where it goes, others follow. It is also worth pointing out that the Olivenleder patent has yet to be broken, so these brands' faith would seem well placed.

What is OBE?

Wet-green says that its OBE (olivenblatt-extrakt) is the only vegetable tanning agent in the world which has two natural binding mechanisms by combining the best of two worlds, phenols and a natural cross-linker. It also says that availability is not a problem as using the leaves of the Mediterranean olive harvest only, it can accommodate more than 40% of global leather production. "By using other by-products such as the pomace (filter cake) and the olive mill wastewater (black water), there is the potential to convert global leather production to being tanned with by-products from olive growing for a real circular system," claims Mr Lamparter.

An attractive feature of Olivenleder, besides its environmental credentials, is the variety of leathers it can produce. For example, whereas vegetable tanning normally results in a firm finished material, the OBE system can produce a variety of textures and colours, something that more and more brands are picking up on. The company claims that virtually any type of footwear can be produced, including casual sneakers, work boots and dress shoes. The only limitation so far is the hydrophobing for military grade leathers used for

This work boot by Patagonia is a perfect example of a circular approach. Tanned by Horween, it is based on Patagonia Wild Idea Provisions Buffalo Jerky and uses the hides as by-products.

CREDIT: PATAGONIA

hiking boots which can be subjected to hours of water contact. The tanning agents present are the same as those found in some natural cosmetics and in extra virgin olive oil, and are designed to be neither corrosive nor a hazardous substance.

Good all round properties

The colour possibilities for Olivenleder are said to be limitless and the leather just as soft as traditional conventional leathers. The substance of the olive tree that protects it, Oleuropein, takes on the task of glutaraldehyde, zeolites or other metals in the tannery, ensuring a soft and flexible bonding of the skin fibres. Lamparter says the complete ingredient list of this tanning agent would fit on the smallest note: Oleuropein. It is extracted from olive tree leaves, olive oil production residues and olive mill wastewater through a globally patented process which maintains its unbroken status.

Numerous awards from reputable institutes confirm that this tanning agent has the potential to be a sustainable and healthy game-changer. The USDA has awarded it the '100 percent Biobased/BioPreferred' label and the German Dermatest seal confirms its 'excellent' skin compatibility. Wet-green says that the fact that it can already meet over 40 percent of the global leather demand by using only the leaves from olive growing is yet another reason why tanners and their shoemaking customers have no need to take risks in the future. Consumers will appreciate being able to afford the luxury of sustainability in a completely transparent manner for a more sustainable and circular future of leather, without headaches. ■



More than 2.25 billion cups of coffee are drunk around the world every day.

CREDIT: SHUTTERSTOCK / IMRANAHMEDSG

What's next?

Coffee is the world's second most traded product after oil. It is also the world's second largest beverage only exceeded by water. The global coffee consumption in 2020/2021 was nearly 10 million tonnes and it is increasing. However, only about 30% of a coffee bean's mass can be extracted into the coffee we drink, so the other 70% ends up as spent coffee grounds, which have traditionally been disposed of as waste (spent coffee grounds or SCG). As a result its reuse has received much more attention, especially in the recent decade.

As a matter of fact, the quality of SCGs is higher and more consistent than other wastes, offering the possibility to recycle as a single stream. These desirable aspects together with its diverse chemical compositions offer a desirable case for product upcycling so it is not surprising to find that interest in SCG upcycling is on the increase, as are supportive policies to drive the necessary technology forward in order to achieve this. One company that is pursuing this goal is Dasheng Chemical (DSC).

Dreamcell Xpresso

Founded in 1945 and with manufacturing facilities in Vietnam, Indonesia and China, DSC is acknowledged as being a pioneer in foam innovation for the footwear industry. Known for its premium comfort and performance, the company supplies its Durapontex and Dreamcell foam materials and components to some of the world's top brands and is constantly pushing the boundaries of what is possible.

It has recently introduced a new product called Dreamcell Xpresso, an innovative foam technology made with spent coffee grounds that offers the same degree of comfort and performance as existing Dreamcell products while paving the way for a more sustainable future. The company says that its eco-friendly insole is a superior footwear product, that is designed to reduce waste and greenhouse gas emissions.

More than 2.25 billion cups of coffee are consumed everyday around the world. When the spent coffee grounds are sent to landfill, they can produce methane, which causes a greenhouse effect 28 times

Pressed coffee waste from an espresso machine.

CREDIT: SHUTTERSTOCK / ARTCOOKSTUDIO



greater than carbon dioxide. DSC partners with local coffee providers in Vietnam, the world's second-largest coffee producer, which also creates an astonishing average of 180 thousand tons of coffee grounds every year. DSC says Dreamcell Xpresso will help reduce greenhouse gas emissions by keeping coffee grounds out of landfill and upcycling them into a premium footwear product.

"DSC is committed to reducing our impact on the environment by using innovative bio materials to reduce waste and fossil fuel usage," says Johnson Chang, CEO of Dahsheng Chemical. "With Dreamcell Xpresso, we can extend the life cycle and support a circular economy that benefits both manufacturers and consumers without compromising on comfort and performance."

Recycling SCG

For every one million pairs of Dreamcell Xpresso insoles produced, DSC will recycle approximately 2.19 metric tons of SCG, ultimately preventing the creation of 0.53 metric tons of methane emissions in landfill. This is equivalent to 13.3 metric tons of CO₂ or carbon sequestered by 219 tree seedlings, grown for 10 years. Dreamcell Xpresso polyurethane (PU) open cell foam is made with 20% SCG content, decreasing the amount of fossil fuels and energy in the production process. Aside from a lightweight, breathable foam built for performance and comfort, the coffee grounds also offer a bonus in the form of odour-control and moisture features.

DSC says it is committed to creating sustainable solutions for a greener future, including innovative materials like algae bloom and castor bean oil. The bio materials it proposes to use are non-food, plant-based resources that offer an alternative to reduce fossil fuel usage. Sustainable materials and creating eco-innovation are a step in the right direction toward DSC's ambitious plan to achieve a zero carbon, zero-waste future.

“With Dreamcell Xpresso, we can extend the life cycle and support a circular economy that benefits both manufacturers and consumers without compromising on comfort and performance.”

JOHNSON CHANG, DAHSHENG CHEMICAL

The search for new raw materials that lessen or avoid the use of fossil fuels and their derivatives continues to accelerate as industry comes under evermore pressure from government legislation and increasing consumer concerns as to the world's environmental future. As a result, the footwear industry has seen some remarkable innovations, not least the use of coffee grounds as a filler in foam insoles. So what's next? ■

Insole moulded from Dreamcell Xpresso foam containing 20% SCG.

CREDIT: DASHENG CHEMICAL





CREDIT: AMANN GROUP

A vital component — sewing threads

In the last issue of *World Footwear*, we looked at the important role that the lockstitch plays in the footwear manufacturing process. However, vital though it is, it could not be created without stitching thread. Stitching forms a vital part of the construction of most footwear and threads are therefore a key component for the industry.

Until the development of nylon fibres in the late 1930s followed by polyester in the early 1940s, stitching threads were made from natural fibres. These were primarily cotton, with some silk, linen and hemp used for specialist applications. The advent of new synthetic fibres created a stitching revolution as they were stronger and had better elasticity. They also had greater resistance to needle fray which meant they were easier to use. This improved 'sewability', the word used to describe a sewing thread's performance, in turn led to improvements in needle design as

lighter weight and less bulky threads could be used while the speed of sewing machines themselves increased.

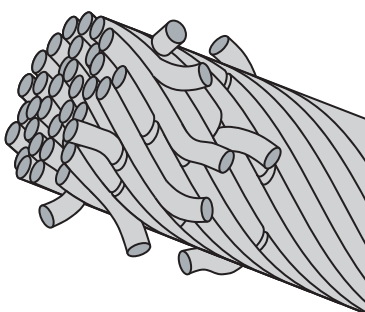
The original synthetic threads were simply twisted and lubricated but, as sewing machines became faster and new upper materials began to be used, greater demands were placed on thread performance. By the early 1960s, speeds on automatic sewing

machines were up to 5,000 stitches per minute and the basic twist spun type of thread could no longer cope.

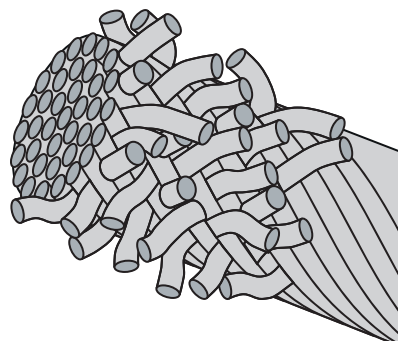
Core-spun threads

The solution lay in the development of core-spun threads that could withstand the extra heat and friction created by the needle moving at higher speeds. Early examples used a combination of polyester/cotton to create a more

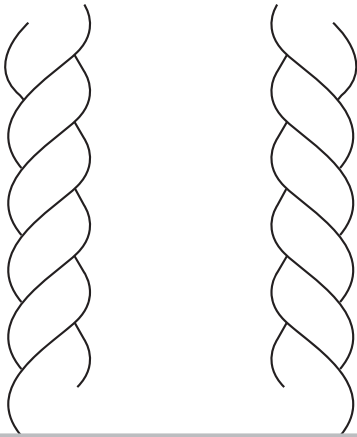
Figure 1: (a) Spun thread



(b) Core-spun thread



CREDIT: AMANN GROUP

Figure 2: (a) Left or Z-twist (b) Right or S-twist

Polyester continuous filament thread produces a neat and strong seam.

CREDIT: AMMAN GROUP

efficient thread construction. This was followed at the end of the 1970s by a significant advance with the appearance of polyester/polyester core-spun threads.

Core-spun threads (Figure 1) differ from conventional spun threads. Spun threads have single yarns consisting of short, cut staples joined by twisting. Core-spun threads, have yarns consisting of a multifilament core surrounded by fine fibres which combine the strength of multifilament threads with the good sewability and surface appearance of those made from spun yarn.

The core usually comprises two-thirds of the thread and the cover one third, with the core sheathed but not fully covered. As with those made from fibre yarns, core-spun threads have a smooth grip and textile surface and, due to the combination of multifilament and spun fibres, their strength and abrasion resistance are far higher. Although these threads also have outstanding sewability even in difficult applications, most footwear uppers are now stitched using threads made from continuous polyamide or polyester filaments.

Whatever the fibre type, most footwear threads are produced by twisting together two or three separate cords. Control over the degree of twist used is essential as threads with too little twist will be prone to fraying, breakage and poor control during sewing. Those with too much twist will have a tendency to knot and twist (twist liveliness) especially around the machine's thread guides.

A further factor which needs consideration is the direction of twist. Threads can be twisted in a 'left-handed' direction (Z-twist) or 'right-handed' (S-twist). Z-twist threads are most commonly used in lockstitch machines, while S-twist ones are designed for specialist applications such as twin-needle machines where opposite twists are required to balance the direction of loop formation during stitching (Figure 2).

Bonded nylon threads

There are, however, many applications where greater tensile strength is needed and this is where nylon, or to give it its correct name,



The filaments of bonded nylon threads are effectively welded together.

CREDIT: CT POINT

polyamide fibres score as they can be up to 25% stronger. Core-spun nylon threads also have better abrasion resistance and this makes them ideal for use in sports shoes. Furthermore, this type of footwear is often exposed to adverse or wet conditions, so the thread must also be extremely strong, able to withstand abrasion and be water resistant.

The answer was 'bonded' nylon threads with a special coating that allowed for even higher speed sewing and a wider variety of upper materials to be used. Typically, a conventional twist construction thread made up from continuous polyamide filaments is impregnated with a urethane resin to bond them together. The filaments are thus in effect welded to each other so that there can be no untwisting or opening during stitching and no frayed ends when cut. The thread can be used at high speed on even the most difficult materials due to a double coating of lubricant which stops the needle overheating and prevents the thread melting.

Thread size

The strength of a thread is directly proportional to its size or weight and, for a given seam, if it is below a minimum size, the seam will never perform satisfactorily. The most straightforward system for sizing threads is the tex system. This is based on linear density and the tex value is defined as the weight in grams of 1,000 metres of thread. This is easily understood and can be applied to any thread.

For synthetic fibre threads, however, most thread and footwear manufacturers refer to the 'metric ticket number' (Nm) system. This is based on the tex of a thread and assigns ticket numbers to specific ranges of tex values. However, as it is calculated by dividing a length over a weight, this means that the lighter the thread, the higher the ticket number and the heavier it is, the lower the number. The most common numbers used as upper closing threads are 20, 40 and 60 for nylon, and 18, 36 and 50 for polyester and corespun.

Sole stitching threads

Until the advent of modern adhesives, stitching offered the most flexible and reliable method of attaching soles over the greatest range of footwear types. Threads therefore evolved in a wide variety of sizes, constructions and raw materials, each suited to a particular type of shoe and remain essential for sole attachment in several key footwear constructions.

The threads used today have their origins in those developed for Goodyear welted and it is extremely important that the correct type of thread is selected for specific applications. These heavy threads are made from various natural and synthetic fibres, each of which produces a thread with its own characteristics. If a combination of fibres is used, then a mix of properties will result depending on the proportions used. The four main types are as follows.

Linen is the traditional choice for welted footwear and is made from the flax plant, which produces strong fibres with low extension. It was for many years thought the best solution for stitching heavy leather, where seam tightness is essential. Most linen threads are treated with a rot proof solution to protect the fibre from biological attack and can be pre-waxed by the thread supplier or by passing it through a wax pot on welt sewing and sole stitching machines.

CF Polyester thread is made from a 100% synthetic material whose individual fibres are many miles in length in exactly the same way as those for stitching uppers. These continuous filament threads (*Figure 3a*) provide high levels of strength and flexibility which makes them suitable for a wide range of sole stitching applications.

Spun polyester is different and in this instance, (*Figure 3b*), staple fibre lengths are used and strength depends on the length of the staple fibre and degree of twist introduced when the fibres are spun into yarns. Stitchability is generally good and they also offer a natural appearance.

Core-spun polyester is produced for welt sewing and is designed to achieve the optimum strength ratio of a continuous filament thread allied to good stitchability and the appearance of linen. Individual yarns are made up of a continuous filament polyester core, with an outer protective sheath of wrapped staple fibres usually composed of cotton (*Figure 3c*).

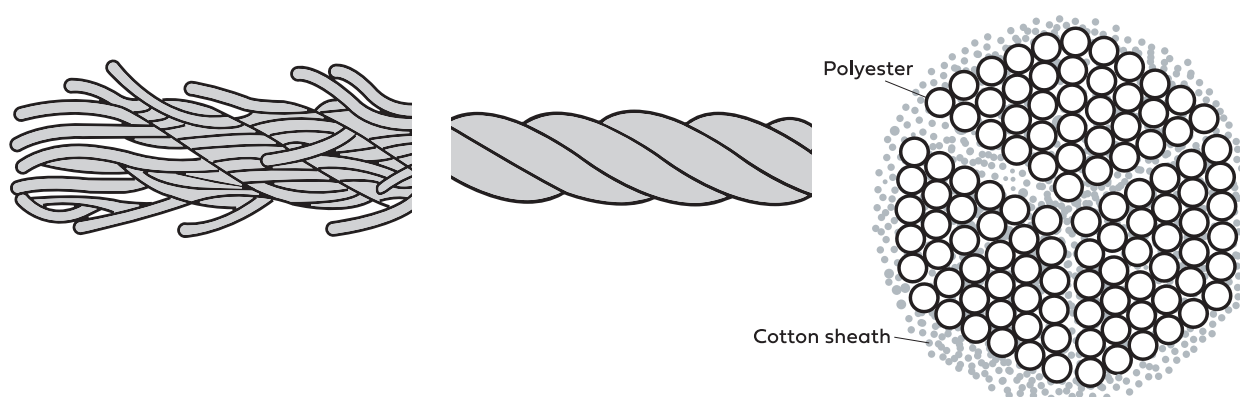
Changing functions

In the past, sewing shoe uppers was regarded as just a basic but essential process, seams were kept to a minimum and designed to be as least visible as possible. A minimum of colours were used, with brown, tan and white predominating in the footwear industry. The arrival of stronger threads made from synthetic fibres allowed thread sizes to be reduced and a wider palette of colours to be created.

Now, as well as forming a functional part of a shoe's construction, upper stitching thread has also become an important visual element of its design. Whether in unique top stitching patterns, heavier than required threads or merely contrasting colours, threads are used to emphasise shape and function as well as visual appeal. The variety of shades now available is almost limitless due to the development of computer colour matching and threads are now used in a much wider range of sizes than ever before.

Some would argue that the evolution of sewing machines has been made possible through the development of higher performance threads. But, as machine technology was developed and refined, the reverse occurred and created a need for higher performance thread. Nevertheless, while sewing machines are now more sophisticated and thread is made from synthetic rather than natural fibres, the actual method of creating the seam remains the same simply because a more efficient and effective way to achieve the same end result is yet to be found. ■

Figure 3: (a) Continuous filament yarn (b) Staple or spun fibre yarn (c) Cross-section core-spun polyester





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The brand has ambitious sustainability commitments but a move away from core products has left some investors questioning its strategy.

Allbirds buffeted by headwinds

Allbirds charted a stratospheric ascent: a mere five years after its launch in 2016, it was valued at more than \$2 billion – known as a ‘unicorn company’ in investor speak (a privately held start-up worth \$1 billion or more). This rapid growth seemed to catch even its founders off guard, admitting to a New Zealand publication they only sold one pair in the first year. But a smart combination of a direct-to-consumer strategy, plus strong and well-communicated core values, including a commitment to reducing environmental impact and to using novel materials, struck a chord with younger generations.

New Zealander Tim Brown, a former professional footballer and founder of the company alongside friend Joseph Zwillinger, aimed to create simple shoes that were comfortable and practical, finding a home for wool that the local sheep farmers were struggling to sell. Wool is an unusual choice in shoes but helped it to stand out from competitors. By March 2018, the company had sold its millionth pair and counted actor Leonardo DiCaprio among backers.

From there it began to branch out, never shy of testing new fabrics and components. It teamed up with Austrian fibre supplier Lenzing to add Tencel to a knitted shoe design, and worked with Brazil-based chemical company Braskem on an EVA resin derived from sugarcane for a component named SweetFoam, now in all of its soles.

Branching out

By 2020, the company made a foray into the athletic sector, producing its first running shoe, the Tree Dasher. This has a dual-density sugarcane SweetFoam midsole from the carbon-negative EVA and a one-piece upper made from eucalyptus fibre, with merino wool around the heel counter and a castor bean-containing insole.



Sales began to soar, and its strategy of selling mainly online seemed to give it the freedom to invest in greener materials and increase its sustainability-focused collaborations. At the start of 2021, it invested \$2 million in start-up Natural Fiber Welding, which uses a process of welding short fibres into longer fibres to create high-performance yarns that can incorporate cotton and other plant-based waste fibres.

The success in the performance category gave it the confidence to launch a clothing collection in mid-2021. The range, named Allbirds Natural Run Apparel, consists of leggings, running shorts, bike shorts and running tops made from merino wool and yarn spun from eucalyptus pulp fibre. It chose chitosan from crab shells to add antimicrobial properties to t-shirts. Mr Zwillinger said later, “We intentionally launched into the footwear category first given its technical nature, building credibility and trust with consumers before moving into



Allbirds' first store in Charlotte, North Carolina, and 36th globally, with locations across North America, Asia and Europe.

CREDIT: BUSINESSWIRE

apparel. We believe our foundation in comfort and simple design, coupled with our success in manufacturing high-quality, sustainable footwear gives us a distinct advantage as we expand into adjacent categories."

Stock market success

By 2021, the company was ready to raise money through an initial public offering (IPO), or listing, on US-based stock market Nasdaq. At the time, it had begun to invest in physical stores – going from three in 2018 to 22 in 2020, with an eye on "ramping towards hundreds of potential locations". The digital channel represented 89% of sales at the time, with bricks-and-mortar only 11%, but shops were viewed as "an effective and profitable source of new customer acquisition, increasing awareness of the brand, and driving traffic to the digital platform".

The IPO prospectus outlined its strategy and DNA to investors: "By focusing on sustainable materials, we have

unlocked a broad set of opportunities that the rest of the industry has largely ignored, while creating products our customers love to wear as they tread lighter," it said.

However, the US Securities and Exchange Commission (SEC) reportedly asked Allbirds to tone down some of the sustainability claims in the prospectus. The company did outline some of the risks: "We have incurred significant net losses since inception, and anticipate that we will continue to incur losses for the foreseeable future," it admitted. Allbirds' net loss totalled \$14.5 million in 2019 and grew to \$25.9 million in 2020, according to documents filed with the SEC. "We operate in a highly competitive market; the size and resources of some of our competitors may allow them to compete more effectively, which could result in a loss of our market share and a decrease in our net revenue and profitability... and our focus on using sustainable materials and environmentally friendly manufacturing

processes and supply chain practices may increase our cost of revenue and hinder our growth,” it added.

Nevertheless, there was high demand, and Allbirds’ shares sold for \$15 each on its debut in November 2021, valuing it at \$3.3 billion.

Carbon footprint

Things continued positively during 2022 as sustainability efforts continued, new products were launched and 23 stores opened. During the year, it cut the average product carbon footprint by 19%, taking it more than 60% of the way towards its 2025 science-based targets, and on track to reach near-zero product carbon emissions by 2030. It added the ‘carbon cost’ to its customer receipts in a bid to increase awareness surrounding carbon footprints, after becoming the first fashion brand to label all its products with their carbon footprint in 2020.

In terms of products, it launched the Regen Collection: two new shoes, plus a revival of a beanie and scarf, made with ZQRX Regenerative Wool, sourced from a holistic farming initiative set up in collaboration with New Zealand Merino Company, Icebreaker and Smartwool. Allbirds also changed its footwear packaging to reduce weight and lower its footprint; transitioned from virgin nylon to recycled nylon; and updated the sockliner in its lifestyle Tree styles to use more recycled materials.

Refocus and reignite

However, by the start of this year, headwinds connected to losses grew stronger. It reported a 7% rise in 2022 revenues to \$297.8 million but a loss of \$101.4 million. As well as confirming the departure of chief financial officer Mike Bufano during the investors’ call to discuss 2022’s results, Mr Zwillinger commented “some products and colours have had narrower appeal than expected” and “because we were spending significant time and resources on these new products that did not resonate well, we underinvested in our core consumers’ favourite products”. This was enough to spook the market and shares later fell to \$1. Multiple law firms have filed a class action lawsuit for losses on behalf of investors. The case is ongoing.

Away from the turmoil, first quarter 2023 results were “better than expected”; revenue decreased 13.4% to \$54.4 million due to a reduced average selling price, as well as a \$1.2 million negative impact from foreign exchange rates. Despite this, revenues were nearly 10% higher than in 2021. “Our teams are executing well against our strategic transformation plan designed to reignite growth, improve capital efficiency and drive profitability,” said Mr Zwillinger. “The dedication and hard work of our flock [staff] resulted in a quarter that demonstrated good progress on our strategic initiatives while exceeding our expectations.”

The transformation plan, announced in March, is designed to reignite growth, as well as improve capital efficiency and drive profitability. Mr Zwillinger remains confident – outwardly at least – in the long-term prospects. “Our mission to create better things in a better way, guided by our Super Natural Comfort north star, remains at the forefront of everything we do at Allbirds as we advance our vision to build a 100-year brand.” ■



CREDIT: ALLBIRDS

Zero carbon: the greatest achievement

Allbirds unveiled M0.ONSHOT, which it describes as the world’s first net-zero-carbon shoe, at the end of June. The high-top shoe boasts a carbon footprint of net 0.0 kg CO₂e and will launch commercially in spring 2024.

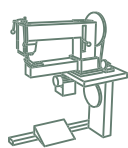
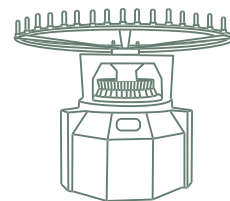
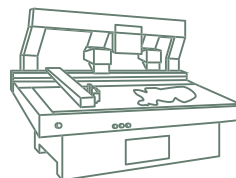
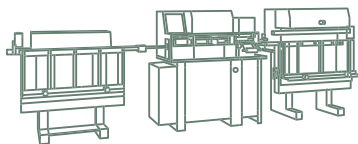
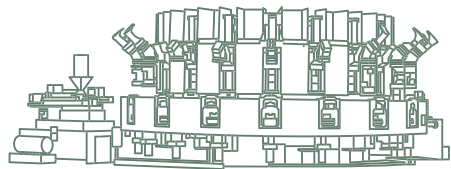
Tim Brown unveiled the shoe at the Global Fashion Summit in Copenhagen and called on competitors to create their own versions. To help, Allbirds is open-sourcing the methodology, including materials, manufacturing, transportation, end-of-life and carbon footprint calculation.

“This is one small step for Allbirds, but it could be one giant leap for the footwear industry, if others join us. Unlike the space race, this is a relay – we’re all on the same side,” he said. “M0.ONSHOT is Allbirds’s greatest achievement, but it’s meaningless without others taking action, which is why we felt compelled to open-source our learnings, so others can pick up the baton and take us forward.”

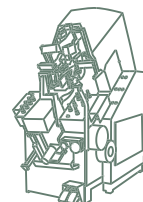
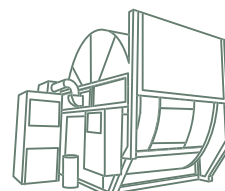
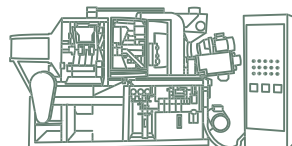
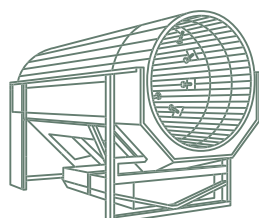
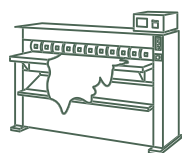
In 2021, it partnered adidas for what was at the time the lowest carbon shoe: the Adizero x Allbirds.

Materials in the M0.ONSHOT include:

- an upper made with carbon-negative regenerative wool sourced from Lake Hawea Station;
- a midsole featuring a specially crafted version of Allbirds’s SuperLight Foam, a carbon-negative bio-based midsole foam made with sugarcane and formed via supercritical foaming;
- molded components including a logo made with methane-capture bioplastic via a partnership with Mango Materials; and
- sugarcane-based polyethylene packaging — a carbon-negative material — reducing weight and space required for transportation.



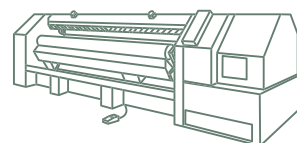
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The sports shoe manufacturing concept meets Decathlon's "desired performance requirements" and "already holds commercial viability".

ALL CREDITS: HP!

On-demand gets directional

Among the aisles of exhibits showcasing the latest in textile machinery innovation from 1,709 international suppliers at quadrennial industry trade fair ITMA in June, an intriguing, new 3D-printed athletic shoe concept caught the footwear manufacturing community's eye. A collaborative effort between French sports retailer Decathlon, US printing technologies developer HP and Italian knitting machinery maker Lonati, the partners claim that the digital-first, mouldless and glue-free method promises to "reshape" the sustainable footwear landscape. This will come through improved customisation and repairability, more localised production, faster disassembly and simpler end-of-life recycling.

Stepping forward

Head of footwear for HP's personalisation and 3D printing business, Barcelona-based Don Albert, tells *World Footwear* that work only began on the project earlier this year. He describes his team's interactions with colleagues from the other two companies as exceptional, citing their "shared commitment to innovation and to pushing the boundaries of technology in the sports industry". Throughout the development process, weekly calls took place between Decathlon and HP, whose HP Jet Fusion 5200 printer was used to produce the shoe's midsole and outsole, during which research and development ideas, materials progress and sustainability updates were all discussed and exchanged.

Separately, Lonati's XT-Machine and Double Cylinder E1530XS systems produced the all-black trainer's sleek,

A multi-stakeholder team of designers, developers and engineers got together to reconsider 3D-printed sports shoe models, just in time for ITMA.

sock-like upper, made from digitally adjustable, single or double-layer knit fabrics that hug the foot. The knitted sock has an almost animal print surface texture. Together with the HP-printed cushion component, these easily separated parts combine to deliver "unparalleled comfort, lightness, performance and quality", in the collaborators' words. Lonati acquired Santoni, the domestic knitting machinery manufacturer responsible for inventing the XT-Machine, back in 1989.

Mr Albert frames HP's industry-ready 3D printing technology as "a significant step forward" for the sector. In place of more complex assembly, typically involving 12 different materials for sports shoes, each Jet Fusion 5200 printer has the capacity to handle up to three jobs per day, depending on the materials choice. Each job represents ten pairs of trainers. No matter where it is installed, one printer alone makes for a commercially viable operation, he suggests, adding that the pair displayed at ITMA "already holds commercial viability". In terms of performance, HP is especially focused on developing footwear suitable for runners, Mr Albert shares. The Reebok and adidas alum

further states that certain shoe materials work particularly well with the printers, resulting in what he calls superior cushioning and energy return for athletes, although he does not elaborate on which materials this refers to. On the sustainability side, the on-demand model makes for an intrinsically lower waste and less-energy-consuming production process.

Materials versus machines

"The choice of specific machines and materials in 3D printing is closely intertwined," Mr Albert explains. Various technical considerations come into play, from temperature range to system compatibility, which inevitably influences materials selection. In turn, end-product performance and functionality ultimately limits designers' choice of materials, which then feeds into decisions around which machines can be used. For the Decathlon concept trainer, the Jet Fusion 5200's versatility in printing multiple materials was key, he notes, allowing the sporting goods retailer's "desired performance requirements" to be met. The series was HP's very first industrial-grade 3D printer. First released in 2019, it was built for cost-efficient scalability and increased accuracy, repeatability and flexibility at factory level, based on "new systems, data intelligence, software, services and materials innovations".

The digital technology furthermore enables full footwear customisation, without additional costs. Without the need for a traditional mould, the manufacturer is free to adapt rapidly and tailor each trainer to Decathlon customers' individual order requirements with precision, according to Mr Albert. This goes beyond colour and design, extending to fit, support and other technical adjustments. From the perspective of Decathlon 'exploration leader', Phillipe Seille, "a new era of sustainable and innovative manufacturing" awaits those who follow HP's 3D printing lead. In terms of materials, the retailer opted for Ultrasint TPU01, a BASF-produced thermoplastic polyurethane (TPU) powder specially designed for HP's Multi Jet Fusion portfolio, of which the Jet Fusion 5200 printer is a part. The powder is converted into midsoles and outsoles inside the machine.

Recyclability was one of the two main decision-making factors that led to Ultrasint TPU01 making the final cut. The substance has an 80% post-consumer reusability rate, meaning it meshed well with the team's vision for lower-resource-intensity shoe manufacturing. Second, what Mr Albert calls the material's "excellent comfort properties" made it "highly suitable" for athletic footwear. Other properties include a Shore A 88 level of hardness. Germany-headquartered BASF has been developing similar concepts since 2010, when it launched its own concept shoe, Pure 1.0, made solely from polyurethane (PU), but incorporating TPU for the laces, inside top layer, chassis, heel cushion, outsole and logo inlays. PU was used for the lower insole, upper and heel. Back then, the



HP's 3D-printed footwear lead, Don Albert, previously spent more than 17 years at Reebok, after beginning his career at adidas.

significance of the concept, to BASF, was to present customers with an early-stage version of an easier-to-recycle product before they knew they needed it.

A productive relationship

Mr Albert says his team was happy to receive frequent, constructive feedback from Decathlon and Lonati, supplying HP with valuable insights that have already helped tweak its printing systems and processes for the better. The partners are actively working together to ready the Jet Fusion 5200 for larger-scale production, first exploring how to make it eco-friendlier and even more efficient. "This iterative process of collaboration and refinement will ultimately contribute to the development of cutting-edge 3D printing technologies that meet the demands of the sports shoe industry," he concludes. ■



Made solely from BASF's Ultrasint TPU01, the HP-printed parts consequently have an 80% reusability rate.



Italian safety footwear company Sixton Peak is among the first to incorporate BOA's new L+1 dials in its ranges.

ALL CREDITS: BOA TECHNOLOGY

Incremental improvements

Three new performance dials from “micro-adjustable, precision-fit” lacing systems developer BOA Technology, headquartered in Denver, Colorado, have reached partner brands’ product development teams. The fit systems include the sportier L6 Dial Y and its scaled-up version, the L+1 Dial C, both hexagon-shaped, in addition to the L+1 Dial D, which has a raised, triangular surface with highly textured, grippy edgings. Each has been engineered to pair particularly well with low- and mid-cut work and safety shoe styles, in addition to what BOA calls hybrid versions of these. Despite launching in all markets simultaneously, the dials noticeably made the biggest splash in South Korea initially.

The company’s commercial manager, Roland Rotheneder, attributes this to local partners’ “very short” development cycle, which means “the market adopts products faster”. Along with shoe brand Vans,

BOA’s latest dials are finely tuned to cater to the demands of the work and safety shoe market.

Korean outdoor sports and safety label K2 was one of BOA’s first two customers, following its founding by entrepreneur, snowboarder and surfing enthusiast Gary Hammerslag in the northern Colorado ski resort of Steamboat back in 2001. BOA, whose name stands for “boot opening adjustment”, still works closely with K2’s design and development teams to this day. The brand describes its integration of the H+il alpine dial system into its Recon 120 BOA and Anthem 95 BOA technical ski boots for autumn-winter 2024 as “the biggest advancement in skiing, let alone boot fitting, in

60 years," for example. Speaking with Mr Rotheneder, he tells *World Footwear* that the South Korean market has exhibited a positive trend in recent years, singling out the outdoor and safety shoe segments as key highlights. Although there still remains "a lot of potential for future growth", the executive adds.

Dialling in

BOA's "dialled-in" fit systems have gained much traction in the global athletic, outdoor, safety and work footwear markets over the years. Function and durability are what provide the common ground, Mr Rotheneder suggests. Yet fashion and even traditionally trained cobblers have also taken notice. Founder of trendy, artisan-led Los Angeles shoe repair, redesign and resoling enterprise Goods & Services, Rory Fortune, has included BOA's closure technology in one of its two, limited-edition Clarks Wallabee desert boot releases in May. In the run-up to the launch, Mr Fortune told *World Footwear* that his company had been given "full creative control" throughout the collaboration, underscoring BOA's enduring appeal among more creatively minded crowds, too.

The business' latest three dials track back to its safety and work heritage, however. Its biomechanical laboratory in Denver is where new components are tested and developed to "further revolutionise traditional shoe upper construction to improve athletic performance", prior to being approved for mass production. The main difference with the two latest models in its L+1 series, designed as a continuation of BOA's L6 and M4 product lines, is enhanced durability, especially on impact, according to Mr Rotheneder. This means mitigating against unintended opening, plus simplified repairs in case of breakage. Since the manufacturer offers a lifetime guarantee on its dials and laces, its testing centre has been built to test products even under extreme conditions, he says. BOA also undertakes frequent gap analyses across the various segments in which it operates, based on feedback from its brand partners and the wider market.

This time, the L+1 dials' lower stack height and smaller diameter work together in such a way as to deliver improved integration in mid-cut shoe models, Mr Rotheneder continues. Both offer improved customisation options, as well as lace compatibility spanning the supplier's L and M power levels and CS2, CS3 and TX5 laces. Its fasteners typically hinge on a proprietary steel wire, nylon guide and mechanical reel torsion fit system. "We have only received positive feedback so far," he tells us, "and therefore expect to see products featuring this platform from all our key brand partners." BOA's Li2 subfamily of dials for low-cut cycling, golf and trail running footwear already employs an incremental opening and release function, as do the newer L+1 dials, the introduction of which the executive expects will only open up greater opportunity for "product segmentation towards super premium" further down the line. Key performance benefits of incremental opening fasteners include eased foot pressure, especially after a long working day.



The two new L+1 dials have been specially developed by BOA for low- and mid-cut shoes.

Future steps

BOA's full range of modern dial and guide platforms uses recycled materials nowadays, with a dedicated in-house team on hand to explore new ways of incorporating more and more recycled and renewable materials. The key, though, Mr Rotheneder emphasises, is to maintain product quality and performance benefits. Last year, the business used 32% less plastic and reduced its production waste by 42% versus 2018, resulting in over 700 tonnes of plastics being diverted from landfill. Reusing post-industrial scrap, investing in high-efficiency machinery and pursuing lower-waste, optimised product and packaging designs likewise all serve to fulfil this mission. Outside of sustainability, BOA's vision remains to "inspire athletes and enable peak performances", he concludes. Its main target, as of now, is to pursue a "dialled-in" mindset among the company's user base, beginning with new categories such as alpine skiing. ■



The fastenings developer's vision is to continue to "enable peak performances", says Mr Rotheneder. Next up: alpine skiing.



Four safety and work footwear styles picked up prizes at the 2023 Red Dot Design Awards. In addition to high levels of safety and protection for wearers, judges admired manufacturers' choice of materials and attention to detail in terms of comfort and aesthetics in the winning designs.

Award-winning designs

Designers and manufacturers of safety and work footwear products achieved four winners' awards in the 2023 Red Dot international design competition. Shanghai-based manufacturer Andanda Industry Technology picked up three of them, while Puma Safety celebrated one winning design in this category.

Personal protective equipment (PPE) is Andanda's specialism. It says its aim is to "build PPE ecosystems" for its customers, providing high levels of protection for workers from head to toe. Its products are in use at more than 10,000 customer organisations, representing sectors as diverse as energy, automotive, aerospace, mining, food production and construction. It has an in-house design team and its own centre for innovation. The professionals who work there use digital technology to develop what the company calls "tailored products and customised solutions".

Mines in mind

Its Red Dot-winning Ultiguard industrial rubber boot is the work of its in-house design team and, in its entry for the 2023 competition, it credited two members of the team in particular, Jiaqing Hong and Xuelian Fang for the design of this product. The boot is waterproof and, Andanda has said, was designed with mines in mind. The conditions in mines are complex, according to the Chinese company, with the



danger of falling debris as well as underfoot conditions that can be wet and difficult. With this in mind, the company offers impact protection and waterproofing in this boot.

The competition jury said the product resolves the conventional problems of most clunky, industrial rubber shoes through "a successful choice of materials and functional efficiency". It has a puncture-resistant Kevlar midsole and protective caps made from aerospace aluminium, while remaining "relatively lightweight". To improve visibility, the upper material has been equipped with bright elements and reflective stripes. In addition, the abrasion-resistant outsoles are made of a rubber compound that is slip-resistant, even in oil.

The Puma Safety Frontcourt Mid shoe was a winner for ISM Heinrich Krämer.
CREDIT: ISM HEINRICH KRÄMER/PUMA SAFETY



Vintage look

The Puma Safety brand's winning product was the Frontcourt Mid, a work shoe whose design focuses on functionality and on aesthetics, the company claims, pointing out that, in addition to safety and comfort, it offers "an iconic look, reminiscent of famous vintage basketball shoes". Athletic footwear, including shoes for basketball, is what Puma is most famous for. However, Puma-branded safety footwear is the preserve of licensed partner company ISM Heinrich Krämer. It was this partner that designed and made the award-winning shoe, with the idea of making wearers feel comfortable with their appearance as well as safe in their work an integral part of the project.

“Our award-winning products make the world of work a little safer every day and always cut a fine figure.”

ISM HEINRICH KRÄMER

To achieve the right combination of functionality and look, the company had to "meet the requirements associated with everyday wear", the Red Dot jury observed, which in work footwear of this kind, as ISM Heinrich Krämer knows well, means heat resistance, slip resistance, stability and cushioning.

But at the same time, the jury continued, the Safety Frontcourt Mid manages to provide wearers with “a positive user experience”.

The footwear design and manufacturing partner behind Puma Safety says: “Our award-winning products make the world of work a little safer every day and always cut a fine figure. We are proud of our award winners and are working at full speed on more innovative ideas and solutions for more safety and more comfort.”

Weight reduction

Two further entries from Andanda completed the safety and work footwear complement at the 2023 Red Dot Awards. Its Infinity safety shoe was a winner, with the jury describing it as having “good functionality and excellent wearing comfort”. The Shanghai-based manufacturer says these properties come principally from a reduction in the shoe’s weight, which it achieved through what it calls “clever material selection”.

The upper material is made of recycled polyester, the toe-cap of perforated aerospace aluminium and the midsole of an unnamed lightweight, puncture-resistant material. The outsole improves the shoe’s cushioning and shock absorption, and is also slip-resistant, even in oily environments. Rubber coating around the outsole sides provides walking stability. Lastly, the laces on Infinity Safety Shoe can be tucked away to prevent accidents; this is common, but the Andanda design, once again the work of in-house design team member Jiaqing Hong, allows wearers to tuck the laces into the shoe elegantly, the company claims.

Back-friendly

A second version of this shoe, the Infinity Future, was the fourth and final winning safety footwear design at the 2023 edition of the Red Dot Awards. As the name suggests, this version has a futuristic look, with an upper constructed from knitted yarn to give a metallic mesh-look; this construction uses proprietary technology called Nexus. Andanda describes the fibre it has used as a cut-resistant, thermoplastic nylon yarn.



Andanda scored a second victory with its Infinity safety shoe, earning praise from the judges for the product’s “excellent wearing comfort”. CREDIT: ANDANDA



The Ultiguard industrial rubber boot, one of three winning designs at the 2023 Red Dot Awards for Shanghai-based PPE specialist Andanda.

CREDIT: ANDANDA

Safety benefits include a reduced risk to the wearer of injury from sharp objects.

Other features include a dial system for the lacing, supplied by Shenzhen-based Fitgo. Andanda has said this makes it possible for wearers to slip the shoe on and off easily. One extra benefit of this that the manufacturer points to is that it makes the Infinity Future a “back-friendly shoe”. Once again, the in-house team’s Jiaqing Hong receives credit for the design of this shoe, making this an impressive personal Red Dot hat-trick. ■



A mesh-look and dial system for lacing gives Andanda’s third Red Dot winner, the Infinity Future, a distinctive, futuristic look.

CREDIT: ANDANDA



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Divide and conquer

Authentic Brands is on an ambitious shopping spree. The US-based 'brand development platform' has racked up an impressive 40 brand names over the past few years and footwear companies are among its favourite kind of purchases.

One observation about these deals is how much they are reminiscent of an investment portfolio. Private equity firms have long since been keen on struggling shoe companies – reorganising management, streamlining, stripping back and making them more efficient from an economic standpoint: think Permira with Dr Martens, Electra with Hotter and L Catterton with Birkenstock, to name a few. Authentic is not a buyout firm and its strategy is not the same – it favours a licensing model, working with partners to manage different products or geographies and splitting responsibilities – but there are similarities.

Half-baked

UK-based fashion brand Ted Baker was launched in 1987 by Ray Kelvin and rose to become a high-street favourite, synonymous for its colourful prints and fashion-forward designs. But the company began to falter in the late 2010s and Mr Kelvin became embroiled in a scandal in 2019 when 200 employees published a petition, which included accusations of

Authentic Brands' licensing model for Reebok, Ted Baker footwear and Hunter Boot is reminiscent of private equity moves and raises the question: where does the value of a company lie?

inappropriate behaviour. Although he denied allegations and stepped down, the share price tumbled and in 2020, the company was found to have overstated the value of its stock by £58 million. Sales were hit badly during the pandemic following store closures and reportedly consumers' new preference for casual styles. This left interim successor Rachel Osborne with the unenviable task of presiding over 600 job cuts across head office and stores. Enter Authentic, buying the company for £211 million at the start of this year.

Then began the shake up, with CFO Marc Dench, chief people officer Peter Collyer and business development director Helen Costello among senior management to leave as ABG set up Ted Baker Design Group with partner PDS to run the design and

merchandising functions. On the footwear side, this May it signed a long-term licensing agreement with Canada's Aldo Group to design, produce and distribute Ted Baker footwear through Ted Baker's direct channels, including tedbaker.com and Ted Baker stores worldwide. It will also design, produce and distribute its handbags at wholesale throughout the US and Canada. Aldo will work with the London-based team to develop the collections, beginning with spring 2024.

Jonathan Frankel, president of Aldo Product Services, says, "This relationship will unlock the full potential of the Ted Baker brand in the footwear and handbags categories. Ted Baker is a significant partnership for us and as we start our journey together, we plan on drawing from the brand's vibrant DNA, combining fresh and innovative concepts, to bring the brand to the forefront of the market."

Hunting ground

A similar strategy has been announced for Hunter Boot, after its sale to ABG was concluded this June. The company has two royal warrants and has expanded from being a rubber boot company to a brand that also offers outerwear, bags and accessories. However, its revenues were decimated during the pandemic as festivals and outdoor events – its biggest sales drivers – were cancelled, leaving it in a vulnerable position and in need of support. Pall Mall Legacy, a Goldman Sachs-backed investment vehicle, injected £16.5 million and became the majority shareholder but a new buyer was sought.

As the ABG sale concluded, it announced Marc Fisher Footwear as the core footwear partner for Hunter in the US, taking on the brand's footwear design, wholesale and e-commerce operations. The Batra Group is the core licensee in the UK and Europe, responsible for designing and developing Hunter footwear, apparel and accessories and operating Hunter's branded retail stores, wholesale distribution and e-commerce in those territories. Jamie Salter, CEO of Authentic, said: "We are also pleased to expand our relationships with two long-standing Authentic partners, each of whom has a proven track record of unparalleled expertise in product development across a range of categories and an established network of prominent retailers."

Reebok split

Perhaps ABG's biggest footwear deal was in 2022 for Reebok. Sportswear company Adidas paid \$3.8 billion for the brand in 2005 but sold it to ABG for €2.1 billion in a battle against private equity firms Advent, CVC, Cerberus and Sycamore. The deal made ABG more attractive to investors such as CVC Capital Partners and HPS Investment Partners, which subsequently came on board as "significant stakeholders".

ABG then teamed up with the SPARC Group to launch the Reebok Design Group (RDG), a "global brand hub for the design, development and innovation for footwear and apparel servicing partners around the world". All operators will partner with RDG to evolve the product design, development, innovation and creative direction for each region, it said. Regional partners include New



ABG bought high-end wellington boot company Hunter this June.
CREDIT: ABG

Guards Group, Tristate, Trend Marketing, Al Boom Marine, Aditya Birla Fashion Retail Limited and CRC Sports.

ABG has been quick to look for expansion for Reebok. It secured a deal with Botafogo to mark the brand's return to Brazilian football after its success in the 2000s; and more recently it teamed up with Bugatti, which is charged with creating and distributing Reebok travel luggage, wheeled duffle cases and travel accessories for the US and Canadian market.

Supplier relationships

However, the licensing model does present a question: where does the value of a company lie? What importance does the heritage, the culture, the experience of the staff impart? How about the supply chains and relationships with the tanners, the chemicals companies, materials makers, components producers and manufacturers? There has been no announcement about what will happen to these suppliers once another company has been put in charge. Is the value of the brand merely the name, as the Bugatti deal suggests? ABG has stated an "essential pillar" of its strategy is "preserving Reebok's DNA and a commitment to the brand's heritage" but gave no further information on how this will happen, when other companies are in charge.

The strategy is increasingly appealing to the big-money funds and investors. In July, private equity firm General Atlantic invested an extra \$500 million in ABG, bringing its total invested capital to nearly \$2 billion. These firms must see a way to draw out more profit from the brands – perhaps through 'efficiencies', perhaps through better management, investments and the power of expanding globally. Only time tell whether the purchases will be short-lived once profits are increased, but ABG's rapid ascent makes it appear that it is a lucrative strategy. From the consumer side, they are unlikely to be aware of the changes behind the scenes, but for employees and suppliers, it remains unclear whether this strategy resembles a licence to thrill or a licence to kill. ■



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Fears for shoe production in France

A footwear company from California, Titan Industries, has emerged as the successful bidder in a fight in France to save shoe brand Clergerie from liquidation. The famous brand name survives, but senior figures in the French footwear sector wonder if its survival will come at a high cost to the country's footwear heritage.

Clergerie, founded in 1981, is an important part of that heritage because of its roots in the famous shoe-making town of Romans-sur-Isère, 100 kilometres south of Lyon. These roots go substantially further back than 1981.

Founder, Robert Clergerie, is on record as saying he came late to the footwear industry. He was 37 years old when he responded successfully to a job advertisement for a manager at one of the factories that Charles Jourdan operated in Romans in the 1970s. Mr Clergerie had left school at the age of 14 and worked for ten years in his father's grocery store before drifting to the US. When he returned to France, he worked in a number of jobs, none of which instilled any passion in him. Then he answered the Jourdan advertisement and everything changed. "That job advertisement was the revelation of my life," Robert Clergerie once told French media. "At long last, I was happy, in mind and in body."

Roots in Romans

This was his introduction to footwear, which he dived into more deeply when, in 1978, he seized the opportunity to acquire an iconic Romans shoe factory. The factory had belonged to UNIC, on record as being the town's first footwear brand, having been set up by an industry pioneer named Joseph Fénestrier in the nineteenth century. Mr Clergerie now had a direct link to the beginnings of the business with which the town had become synonymous, not just in the form of the building, but also in the deep knowledge of footwear craftsmanship that the workforce there possessed and a rich archive of information about styles, materials and construction techniques dating back to the 1890s.

Before long, Clergerie was the footwear brand of the stars with Madonna, Lauren Bacall and Bianca Jagger among its customers. Investment firms began to show an intense interest in high-profile footwear brands either side of the turn of the century. Robert Clergerie sold 90% of his business to investors in 1996, keeping 10% and staying on as creative director. But he stepped

Not for the first time, Clergerie emerged from administration in mid-2023, but the latest group to acquire the French footwear brand has inspired little optimism about the long-term prospects for shoe production in France.

back from the company in 2001 and had to watch while the brand and a number of other prominent Romans-sur-Isère shoe companies struggled to repeat the successes of the 1980s and 1990s in the new millennium.

Troubled times

Stephane Kélian suffered bankruptcy in April 2005 and later attempts to revive the brand name proved short-lived. In August 2005, Charles Jourdan suffered the same fate. And, that same year, Clergerie was on the brink of following them. However, three days before the courts declared the company bankrupt, its founder put money on the table to buy it back. He was 70 at the time, but said he could not bear to watch the brand die, not least because he knew all of its employees by name. He has referred to this period as a kind of second youth for him and he threw himself into the footwear industry once more. This second youth lasted seven years, after which, Mr Clergerie sold up to new investors and retired again. The company changed hands more than once in the years that followed, with First Heritage Brands, part of the Li & Fung Group, taking ownership at one stage, and then a group called French Legacy picking it up.

There was talk until recently of renovating the factory with digital technology and establishing a new on-site boutique, a museum and a restaurant. However, in April this year, French Legacy submitted papers to the Paris Commercial Court putting Clergerie into administration, opening the door for interested parties to bid to become the latest to attempt to revive the brand's fortunes. On June 29, the court approved the brand's acquisition by Titan Industries.



A Clergerie boutique in Paris.
ALL CREDITS: CLERGERIE

“We might have a chance if we worked in leathersgoods, but in our industry, in footwear, there is nothing left in France.”

SANDRINE MARTORANA, FORMER CLERGERIE ARTISAN

Court decision

Details of the bid that media in France have reported suggest a price of €700,000 and the promise that the Clergerie workshop in Romans-sur-Isère and a number of own-brand boutiques in France would remain open. This is the good news. On the other hand, though, Titan Industries has said it will make 55% of Clergerie employees redundant within one month; this measure will affect 79 people.

As soon as the news came out, trade union organisation CFE-CGC expressed a lack of optimism about the prospects of the Clergerie craftspeople who remain in Romans. A union spokesperson, Christophe Charon, told national newspaper *Le Monde* that the new buyer was a seller of shoes that sources its products in China. “Within two years,” he said, “production in Romans-sur-Isère will be over for good.”

A different tack

In its mission statement, Titan Industries describes itself as having a commitment to offering quality luxury footwear and outstanding service as a foundation for successful growth and strong business partnerships. In 2017, it acquired Beverley Hills-based fashion brand Badgeley Mischka and offers shoes under that brand’s



Production of Clergerie shoes, boots and sandals will continue at Romans-sur-Isère, but French footwear industry figures are not sure how long it will last.

name and under the name American Designers, as well as running sub-brands for bridal shoes and for glamorous footwear. Titan’s other brands are L’Agence, Daniel X Diamond and Dee Ocleppo. The Clergerie does seem to take Titan on a different tack from this.

The California-based group has largely remained tight-lipped about its latest acquisition, but its chief executive, Joe Ouaknine, also spoke to *Le Monde* following the court announcement in late June. He expressed the opinion that Clergerie was still “a brand with a lot of potential”. He said he had canvassed the views of large retail groups and had received assurance that there is a customer-base for Clergerie shoes. He said his aim was to introduce some new styles that will meet what he called current demand, but insisted Titan would do this just by “dusting the brand off” while sticking to its DNA.

The same newspaper spoke to a Clergerie craftsperson, Sandrine Martorana, who worked for the footwear brand for 24 years before being made redundant after the April upheaval. She said she held little hope that she and her fellow footwear artisans would be able to find jobs in other factories. “We might have a chance if we worked in leathersgoods,” Ms Martorana said, “but in our industry, in footwear, I think it will be impossible. There is nothing left in France.”



New owner, Titan Industries, insists Clergerie is still a footwear brand with “a lot of potential”.



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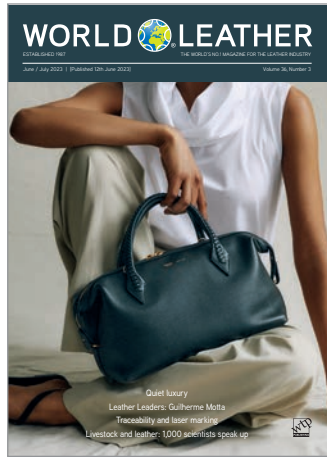
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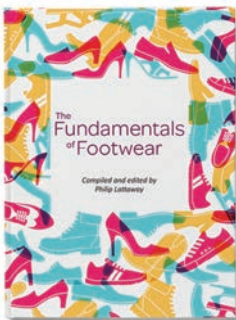


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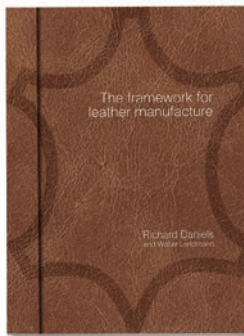
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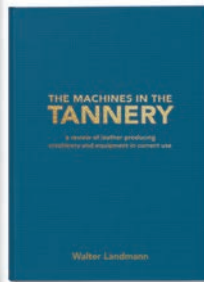
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