Indian Leather

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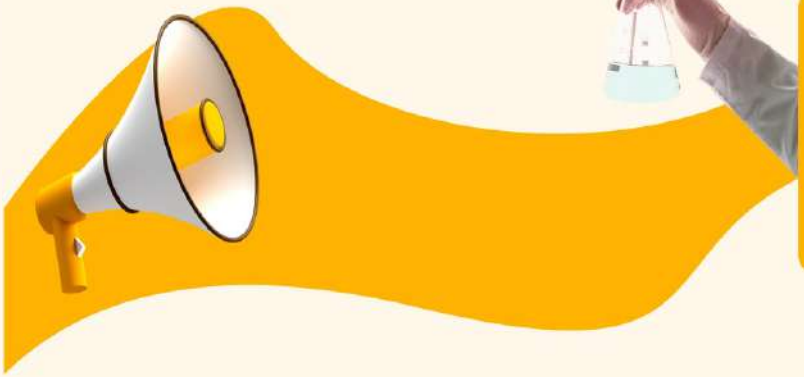

Current Job Openings

Senior Production Manager

Kanpur, India

₹15 LPA

Requirements:

- Detailed knowledge in Chemicals, especially leather chemicals
- Minimum 5 years experience in reputed Leather Chemical Manufacturing company
- B.Tech in Chemical Engineering
- **Accommodation** - Company-provided housing is available for qualified candidates relocating to kanpur.

Location: Kanpur, Uttar Pradesh

Leather Technologist

Kolkata, India

₹7.5 LPA

Requirements:

- Strong knowledge in Leather Chemicals
- Minimum 5 years experience as a Leather Technologist
- B.Tech or Diploma in Leather Technology
- **Accommodation** - Company-provided housing is available for qualified candidates relocating to Kolkata .

Location: Kolkata, West Bengal

Indian Leather
Digest of Leather News

59th Year

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Welcome GST reforms **Editorial**

At the 56th GST Council Meeting, the Government has introduced a **simplified GST structure** with **significant rate reductions** across key sectors of trade and commerce. Essential industries such as **leather, footwear, paper, textiles, handicrafts, toys, packaging, and logistics** have been covered under this reform. The new rules consolidate the previous tax rates of 5%, 12%, and 18% into just two main slabs: 5% and 18%. The aim is to boost the present businesses and startups and incentivise the youth to enter into businesses and initiate startups. It is intended to boost the leather and footwear industry through simplification and reduced tax rates on a wider range of goods. This move of the government also aims to stimulate consumer demand and support domestic manufacturers and suppliers particularly MSMEs.

The leather and footwear sector is a key employer, directly benefitting the youth, in India, with a strong export base. GST rationalisation here reduces the burden on young manufacturers and makes products more accessible to the consumers.

GST has been reduced from 12% to 5% on chamois leather, composition leather with a basis of leather or leather fibre, and leather prepared after tanning. Footwear priced up to ₹2,500 per pair now attracts a uniform 5% GST, a significant reduction from the previous 12% rate for products over ₹1,000. This makes a much wider range of footwear more affordable for consumers, especially in price-sensitive rural and semi-urban markets. The lower GST rate is expected to reduce the retail prices of most daily-use and festive footwear. However, footwear priced above ₹2,500, continues to attract an 18% GST rate. This could potentially temper demand in the luxury segment, as premium products become more expensive for the consumers.

The GST rate on job work services related to hides, skins, and leather was reduced from 12% to 5%. This directly reduces the production costs for MSMEs and young entrepreneurs in the sector. The GST on footwear repair services has been reduced to 5% from 18%, making them more affordable for consumers.

However, premium and luxury brands may face the challenge of justifying higher prices due to the unchanged or increased 18% GST on their products. It is to be noted that traders, holding older stocks procured under the high-tax regime may have to face a short-term working capital strain.

CLE organises "Soles for Souls" Marathon- 'Run for Drug-Free Society'

- **A primary focus on raising awareness about drug-free society besides promoting the brand image of footwear and leather industry**

The Council for Leather Exports (CLE), in association with the CLE Employees Charitable Trust, and with the support of Government of Tamil Nadu and in partnership with the Tamil Nadu Tourism Development Corporation (TTDC), SIPCOT, Greater Chennai Police and more than 42 educational and training institutions and colleges from across the city, would be organising the Second Edition of **"Soles for Souls"** Marathon - 'Run for Drug-Free Society on 28th September, 2025. The event would start from Napier Bridge, Island Grounds with the participation of over 10,000 runners, and feature three categories namely 3 km - Minimum Age : 8 Years, 5 km - Minimum Age : 12 Years and 10 km - Minimum Age : 16 Years. Each participant would be provided a T-Shirt, Finisher Medal, E-Certificate and Race Day Hydration and breakfast.

The first edition held on 29th September, 2024 attracted over 4500 participants which include runners, students, youth, NGOs, workers and corporate.

Shri R Selvam, Executive Director, Council for Leather Exports, during the Press Meet, has said, "As we march towards our goal of becoming a Developed Nation, it is important to have healthier minds and physique. The Soles for Souls marathon aims at not only creating awareness about the adverse health and psychological effects of drugs, but to promoe healthier lifestyle as well."

Shri Rajendra Kumar Jalan, Chairman, CLE, has in a message, thanking the Government of Tamil Nadu for their great support, said, CLE is aiming to expand this marathon to cities such as Kanpur and Delhi in the first phase and to other cities as well in future. Shri Abdul Wahab, Regional chairman-Southern region, CLE, expressed his happiness to be part of this initiative, for achieving a noble cause of drug-free society, assured the full support of the Leather & Footwear industry.

ILTA celebrates 75th Foundation Day and organises Prof. B.M. Das Memorial Lecture

The Indian Leather Technologists' Association (ILTA) had organised functions concurrently on 14th August 2025 at its three centres, Kolkata, Kanpur and Chennai)

KOLKATA

The Indian leather Technologists' Association (ILTA), held the program at the Mini Theatre of Science City, Kolkata.

Dr. Amitava Bandopadhyay, Former Director, ICAR - National Research Centre for Groundnut and Founder National Coordinator, ICAR-National Agricultural Science Fund, was the Chief guest and delivered the Prof. B.M. Das Memorial Lecture on the topic" Leather Technology from the Perspective of Circular Agri-economy"

The function started with Shri. Arnab Jha, President, ILTA delivering the welcome address, which was followed by a brief narration of the journey of 75 years of ILTA by Shri. Susanta Mallick, General Secretary, ILTA.

Mr. Ramesh Juneja, Vice Chairman, Council for Leather Exports (Eastern Region), Mr. Tapan Nandi, Chairman ILPA Leather Goods Park, Dr. Prabal Deb, Principal, GCELT, Kolkata and Dr. Uptal Kumar Karmakar, Managing Director, West Bengal Livestock Development Corporation Limited, Kolkata, were the Guests of Honour, and also addressed the gathering. Thereafter, Mr. Susanta Mallick announced the names of the recipients of Prof. B.M. Das Memorial Medals, the Prof. J.M. Dey Memorial Medals and Certificates.

1) Mr. Kuntal Ghosh- Maulana Abdul Kalam Azad University of Technology, West Bengal. 2) Mr. Anish S, Anna University, Chennai. 3) Mr. Sandeep Priyadarshi, Maulana Abdul Kalam Azad University of Technology, West Bengal. 4) Ms. Anjudha M, Anna University, Chennai. 5) Mr. Jaiganesh P, Anna University, Chennai

Snapshots of 75th Foundation Day Celebration of ILTA at Kolkata

Mr. Sandip Das was presented with Prof. J. Sinha Roy Memorial award for his article titled “Dichromate Reduction without Reducing Agent” published in February 2024 issue of JILTA.

On this occasion, the 2nd edition of the book “Comprehensive Footwear Technology” authored by Mr. Shome Nath was formally launched.

The event then proceeded with the audio address of the Master of Ceremony (M.C.), followed by the release of the Digital ILTA platform.

The launch was accompanied by the audio message of Mr. Kamalesh Karmakar and a specially prepared digital presentation, showcasing the vision, features, and future potential of the Digital ILTA initiative.

This was followed by the much-awaited Prof. B. M. Das Memorial Lecture, delivered by Dr. Amitava Bandopadhyay. In his insightful address, Dr. Bandopadhyay spoke on the topic *"Leather Technology from the Perspective of Circular Agro-economy"*. His deliberation was enriched with a comprehensive slide-show presentation, offering valuable perspectives on the integration of leather technology with sustainable agricultural and circular economy practices.

The first session of the program came to an end with Mr. Asit Baran Kanungo, Vice-President, proposing the vote of thanks.

The 2nd Session commenced with Technical Lectures on the theme **"Availability & Quality of Raw Hides and Skins".**

Dr. Manoranjan Roy, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata, delivered an illuminating lecture on ***"Livestock Management and Leather Quality"*,** which was presented with the aid of a detailed PowerPoint presentation. His address highlighted the vital link between scientific livestock management practices and the enhancement of raw material quality for the leather sector. The lecture was received with keen interest by the audience, reflecting the relevance of the subject to the industry.

Dr. Chandi Charan Panja, Manager (Operations), West Bengal Livestock Development Corporation Limited, Kolkata then delivered his lecture on ***"Common Defects of Goat and Sheep Skins & Their Causes"*,** accompanied by a comprehensive PowerPoint presentation. His talk provided practical insights into the origins of raw hide and skin defects and their impact on the leather industry. The lecture too was received with keen interest by the audience, who appreciated the clarity and applicability of his observations.

To conclude the session Dr. Buddhadeb Chattapadhyay, Former Principal, Government College of Engineering & Leather Technology, Kolkata, and MCKV Institute of Engineering, Howrah, offered a summing up of the lectures, integrating the key points and underlining their relevance for the industry and academia alike.

This Session ended with the Vote of Thanks delivered by Mr. Pradipta Konar, Joint Secretary, ILTA.

The 3rd Session of the event commenced with a Panel Discussion on the theme **"Availability & Quality of Raw Hides and Skins",** moderated by Dr. Buddhadeb Chattapadhyay. He introduced each of the eminent participants of the Panel Discussion namely: Dr. Arnab Sen, Head & In-Charge, ICAR-IVRI, ERS, Kolkata; Dr. Manoranjan Roy, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata, Mr. Chu, Proprietor, Universal Leather Agency, Kolkata, Mr. Zia Nafis, Partner, M/s Nafis Tanning Industries, Kolkata, Mr. Khurshid Alam, Partner, M/s Trident Leather, Kolkata, Mr. Kevin Juneja, Managing Director, J.C. Group, Kolkata, Mr. Tapan Nandi, Chairman, ILPA Leather Goods Park & Partner, M/s Munais Creation, Mr. Rana Rajarshi Dey, Founder & Managing Director, Edcons Group, Kolkata, Mr. Sankar Dawn, Managing Director, M/s Om Leather Artdeco Pvt. Ltd., Kolkata, Mr. Supran Choudhury, Proprietor, Winsome Leather, Kolkata, Dr. Amitava Bandopadhyay, Former Director, ICAR –National Research Centre for Groundnut & Founder National Coordinator, ICAR–National Agricultural Science Fund.

The Panel Discussion was highly engaging and provided deep insights into the challenges and opportunities related to the availability and quality of raw hides and skins. Following the panel, an interactive Question & Answer Session was conducted, in which the audience participated with great enthusiasm, raising relevant queries and contributing valuable perspectives.

The session was then brought together with a summing up of the discussions by the Moderator, Dr. Buddhadeb Chattopadhyay, who highlighted the key outcomes and suggestions.

Mr. Susanta Mallick, General Secretary, ILTA, announced that the deliberations and recommendations from the panel discussion would be compiled, duly signed by all the panel members, and formally submitted as a petition to the Government, ensuring that the concerns and proposals raised during the session would reach the appropriate authorities.

The day's entire proceedings was ably conducted by the Master of Ceremony Mr. Raj Ray.

The Final Session of the Platinum Jubilee Celebrations unfolded with the much anticipated Cultural Programme. The highlight of the evening was a captivating **drama presented by the renowned SAYAK Theatre Group**. Their powerful performance, blending artistry with meaningful expression, held the audience spellbound and was received with **hearty applause and admiration**. The cultural presentation added a memorable touch of creativity and entertainment to the day's celebrations.

The Day-long function came to a warm & joyous close, filled with fellowship and celebration, followed by a dinner.

KANPUR

The program was organized at the auditorium of Kanpur Leather Cluster Complex, Banther, Unnao, UP. The celebration was anchored lively by Ms. Monika Puri, Sales Manager – North India, M/s TFL Quinn India Pvt. Ltd. The introductory speech & welcome address was delivered by Mr. Pulok Mazumder, Vice President, ILTA – Northern Region who welcomed all the dignitaries and members with brief introduction of ILTA's mission and vision and its association with CLRI, CLE and other industry body since, 14th August 1950. Also, during his speech, Mr. Mazumder announced the inauguration of yearlong "Platinum Jubilee Celebration Program" which will be

celebrated at Chennai and Kolkata simultaneously. After introductory speech, floral tributes were paid to the portrait of late Prof. B. M. Das, Father of Indian Leather Industry by the dignitaries present on the occasion.

ILTA
Since 1950

Snapshots of 75th Foundation Day Celebration of ILTA - Northern Region at Kanpur

Mr. Ashraf Rizwan, Director, Mega Leather Cluster Development (UP) Ltd. & Director, M/s Homera Tanning Industry Group, Mr. Asad Kamal Iraqi, Regional Chairman – CLE, Secretary, UP Leather Industries Association (Unnao Chapter) & CEO – M/s AKI India Limited, and Mr. Sumanta Chatterjee, Associate Professor, Leather Technology Department, HBTU, Kanpur, were the Guests of Honour and were felicitated with a Memento & Citation by Mr. Pulok Mazumder. However, Mr. Tariq Rizwan, Technical Director of Homera Group was present during this occasion on behalf of Mr. Ashraf Rizwan who was unable to attend for medical reason.

Dr. G. L. Devnani, Professor & Head, Department of Leather Technology of Harcourt Butler Technical University, Kanpur presented a medal and a certificate to Mr. Oojush Bhardwaj, winner of Sanjoy Sen Memorial Medal for securing 1st Class 1st in B.Tech, Leather Technology Examination of 2025, from Harcourt Butler Technical University, Kanpur. Thereafter, Dr. Abhishek Kumar Lal, Assistant Professor, Harcourt Butler Technical University Kanpur delivered the Prof. B. M. Das lecture on “Institutional Role in Harnessing Robust Industry”. The lecture was well scripted and related to Kanpur leather Industry which was appreciated by all the members and dignitaries.

Mr. Tapas Mukherjee, Sr. Member of ILTA, elaborated history of Kanpur leather Industry and journey from Vegetable Sole Harness leather to modern days chrome tanned Safety Upper and Automotive and furniture upholstery leather making, who spent his production days from Kolkata, Agra and now in Kanpur. Mr. Abhinandan Kumar, Scientist In Charge of CLRI Kanpur, Dr. G. L. Devnani, Head of Leather Technology, HBTU, Kanpur, Mr. Imran Siddiqui CEO of KLC Complex shared few words of their institution and wished to be associated with ILTA Kolkata and Kanpur in coming days in near future. The students of final year from HBTU presented poster campaign for industry in the seminar hall. Thereafter, Mr. Sunil Kumar, Life Member, ILTA & Ms. Jaya Singh Bhadauriya, Leather Technologist from Kanpur delivered Vote of Thanks simultaneously. The event concluded with a high tea.

CHENNAI

The ILTA (Southern Region) in association with the Department of Leather Technology, Anna University (DoLTAU) and CSIR-Central Leather Research Institute celebrated its 75th Foundation Day at Triple Helix Auditorium, CSIR-CLRI, Chennai.. The function started with the welcome address delivered by Mr. N. R. Jagannathan, President, Southern Regional Committee of ILTA. He spoke about ILTA's immense contributions to knowledge sharing, professional networking and leadership in the sector. He also highlighted the Association's close relationship with the industry and its commitment to the welfare of the Leather Fraternity. Dr. K. J. Sreeram, Director, CSIR-CLRI, delivered the Guest of Honour address emphasizing CSIR-CLRI's role as a global leader research and innovation. He stressed the importance of sustainability and circular economy in shaping the future of the industry and strengthening academia-industry linkages to enhance competitiveness and skill development.

Mr. Habib Hussain, Former Research Council Chairman, CSIR-CLRI & Director AV Thomas Group delivered the ILTA Foundation Day Lecture 1 on "Leather Technology: Today and Way Forward for Industrial Growth." He spoke about the various challenges being faced by the industry, and also the existing possible solutions to overcome the problems by creating as opportunities and staying afoot Mr Habib Hussain further stressed the need for digital transformation, smart manufacturing, and Industry 5.0 practices, and strategies to enhance India's global competitiveness through innovation and brand positioning.

Dr. Sanjoy Chakraborty, Former Principal, Government College of Engineering & Leather Technology delivered the ILTA Foundation Day Lecture 2 on "Role of Leather Education in Nation Building" in his presentation, he emphasized Education as the cornerstone for advancing India's Leather and Footwear Sector and the importance of nurturing young talent with multidisciplinary skills. He spoke about the importance of building future leaders who can align scientific innovation with social commitment. Dr. Sanjoy Chakraborty was felicitated on this occasion of his superannuation. Dr. K. J. Sreeram,

Director, CSIR-CLRI presented him with a Citation in recognition of his lifelong contribution to the Leather Education research and capacity building.

Snapshots of 75th Foundation Day Celebration of ILTA - Southern Region at Chennai

The function ended with a Vote of Thanks delivered by Dr. R. Mohan, Secretary ILTA Southern Region. A large number of academicians, industry leaders, technologists and students participated in the event.

OSH INDIA

informa markets

Occupational Safety is a Moral Responsibility, Not Just Compliance: Goa CM Dr. Pramod Sawant at OSH India 2025

- ***Focused on the theme "Elevating HSE for a Globally Competitive Workforce"***
- ***Key highlights included the Startup Pavilion, Innovation Zone, OSH Fashion Walk, OSH Everywhere campaign, OSH Gurukul Conference, and the 11th OSH India Awards celebrating excellence in workplace safety.***

The 13th edition of OSH India Expo-South Asia's largest occupational safety and health event organised by Informa Markets in India, at the **Bombay Exhibition Centre,** Mumbai from **16th to 18th September** 2025, has brought together over **170 exhibitors representing 300+ leading brands and 1,500+ products from 13 countries, attracting 9,000+ visitors, 150+ delegates, and more than 50 speakers.** With India's personal protective equipment (PPE) market valued at **USD 2.7 billion in 2024 and projected to grow at a CAGR of 5.86% to reach USD 4.7 billion by 2033**, the expo has served as a timely platform to showcase cutting-edge technologies, integrated solutions, and product innovations shaping the future of workplace safety.

The Expo was inaugurated by the **Chief Guest – Dr. Pramod Sawant**, **Hon'ble Chief Minister, Government of Goa** & Executive Member, The National Integrated Medical Association (NIMA) India; in the august presence of Guest of Honour - **Shri Anant Pangam, Chief Inspector, Inspectorate of Factories & Boilers, Govt. of Goa; Shri Ram Dahiphale, Additional Director, Directorate of Industrial Safety & Health (DISH), Government of Maharashtra** and other dignitaries**. *Dr. Pramod Sawant in his inaugural address,*** *expressed his views on occupational safety and health, saying, Occupational safety and health are not just legal obligations but moral responsibilities that directly impact productivity and national growth. The Indian PPE market, valued at USD 2.7 billion in 2024, is projected to reach USD 4.7 billion by 2033, growing at nearly 6 percent*

annually, reflecting rising awareness and stronger regulatory frameworks.

Under the leadership of Hon'ble Prime Minister Shri Narendra Modi, India has introduced key reforms such as the OSH Code 2020, Shram Suvidha Portal, and Pradhan Mantri Suraksha Bima Yojana, which are driving compliance and improving worker welfare.

***Shri Ram Dahiphale, Joint Director, DISH, Mumbai, Government of Maharashtra, said**, "The Directorate of Industrial Safety & Health enforces the Factories Act, 1948, to ensure the safety, health, and welfare of workers across Maharashtra. In factory environments where people, machines, and materials interact, risks are inherent. Our role is to minimize those risks and create safer, more compliant workplaces. In today's landscape, ensuring safety is just as important as supporting business growth.*

Mr. Yogesh Mudras, Managing Director, Informa Markets in India, said *"India's safety landscape is undergoing a significant transformation, driven by legislative reforms, digital integration, and a heightened awareness around workplace well-being. Yet, bridging the safety gap in the informal sector, which still accounts for over 80% of India's workforce and enhancing compliance remain critical.*

Shri Mahesh Kudav, President, Safety Appliances Manufacturers Association, Mr. Sanjeev Raina, Executive Director - Corp HSSE,

Bharat Petroleum Corporation Ltd, Capt. Nitin Mukesh, Deputy Nautical Advisor-cum-Sr. DDG (Technical), Directorate-General of Shipping, Govt. of India, Dr. Shyam Sunder Devidas Sonawane, President-Industrial Medical Cell, BJP, Shri Anant Pangam, Chief Inspector, Inspectorate of Factories & Boilers, Government of Goa, Shri Chandrakant (Anna) Nakhate, Member, BJP Cell, Maharashtra were the other speakers who spoke on the occasion.

India's Occupational and Safety Health Landscape

India's journey toward improving Occupational Safety and Health (OSH) is gaining significant traction, reflecting a more mature approach to safeguarding worker welfare across sectors. The Occupational Safety, Health and Working Conditions Code, 2020, which consolidates 13 labour laws under a unified framework, marked a watershed moment in this transformation, and recent state-level activity has added fresh momentum.

This year OSH India 2025 hosted distinctive attractions such as OSH Everywhere, an initiative to amplify workplace safety awareness; OSH Fashion Walk, showcasing the latest in PPE and safety gear; and OSH Gurukul Conference, which featured thought-provoking discussions with industry experts.

The OSH Startup Pavilion emerged as a launchpad for next-generation safety solutions, highlighting disruptive technologies from promising startups – from AI-powered risk assessment tools to sustainable protective gear tailored for future workplace challenges. Complementing this, the OSH Innovation Zone showcased groundbreaking product launches including AI-enabled PPE and smart surveillance systems, reinforcing its role as a hub for innovation in occupational safety.

The event attracted a diverse visitor profile, including senior EHS heads, facility managers, occupational physicians, safety engineers, inspectors, consultants, construction and architecture professionals, CEOs, labour leaders, and policy-makers, strengthening its position as the definitive meeting point for the global safety and health community. A major highlight was the 11th OSH India Awards, where outstanding HSE officers were felicitated for pioneering solutions across industry verticals at a glittering ceremony.

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The 100th edition of MICAM-the world's leading event for fashionable, high quality innovative and sustainable footwear and the 128th edition of MIPEL-the International Leather Goods and Fashion Accessories Exhibition which ran concurrently at the Fieramilano Rho, Milan, Italy from 7-9 September 2025, concluded proving once again their international leadership in footwear and leather goods events with the record attendance of 20,362 visitors of whom 57% were from abroad and 43% from Italy.

While waiting to return to a calendar that once again brings together the main fashion system trade fairs alongside Fashion Link Milano, MICAM, the global leading event for fashion footwear, and MIPEL, the International Leather Goods and Fashion Accessories Exhibition, closed today at Fieramilano Rho with 20,362 visitors, 57% from abroad and 43% from Italy.

Visitors came from 126 countries, with the strongest participation from Spain, Germany, France, Poland, China, Japan, Nigeria, and South Africa, demonstrating the power of trade fairs in creating real business opportunities, further amplified by the synergies of these simultaneous events.

The events presented Spring/Summer 2026 collections from over 1,000 brands, including both Italian and international labels.

The importance of the exhibitions was highlighted by significant institutional presence. The Minister of Education and Merit, Giuseppe Valditara, during his visit, emphasized the government's commitment to supporting the fashion production system and underlined the need for investments that enhance training and local manufacturing as pillars of Made in Italy competitiveness. This point was reiterated by the Minister for Enterprises and Made in Italy, Adolfo Urso, who in his video message at the opening ceremony stressed the crucial role of a sector always ready to invest in sustainability, research, and


NEXT





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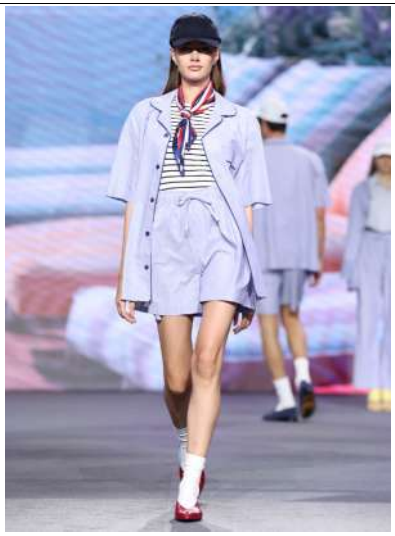



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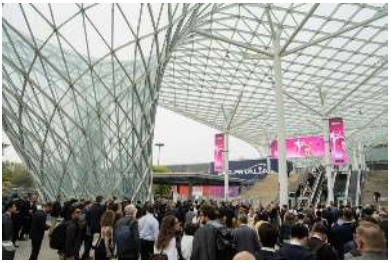

innovation. In line with this, Senator Maurizio Gasparri underlined the importance of trade fairs as engines of foreign commerce and strategic trade relations, stressing the need for policies aimed at supporting Italian companies.

MICAM and MIPEL continue to move forward together, confirming themselves as strategic reference points for their respective sectors despite uncertainties linked to the current economic and political context, and despite the earlier-than-usual scheduling of these events compared to the traditional Fashion Link Milano calendar. This synergy will return in 2026.

The September edition was also the occasion to celebrate MICAM's 100th edition. To mark the milestone, a commemorative stamp was issued on September 7, 2025, by the Ministry of Enterprises and Made in Italy, as part of the series "Excellences of the Production System and Made in Italy", along with the exhibition 100 Steps Into The Future, retracing MICAM's journey from its origins in Vigevano in 1931 to today.

MICAM 101 and MIPEL 129 will take place at Fieramilano Rho, February 22–24, 2026.

ILM 162nd ILM concluded successfully

- **Central platform for the industry attracts exhibitors and buyers from around the globe**

The 162nd edition of the International Leather Goods Trade Fair (ILM) was held from 30 August to 1 September in Offenbach, Germany. The order fair for bags, luggage, school articles and accessories presented some 300 brands from almost 30 countries, thus affirming its role as the world's most important platform for the industry. "Our trade fair is a fixpoint in a changing industry, a must-attend for buyers from the whole world. Particularly in volatile times, ILM remains a place where courtesy, trust and clear orientation are created," said Arnd Hinrich Kappe, Managing Director of Messe Offenbach, summing up three days of the brisk order activity. "No other format brings together such a broad range of brands and collections in such a compact setting." he added

Besides its function as an order fair, ILM is an important meeting place for the branch. It provides space for dialogue and exchange between industry and commerce. Exhibitors and visitors were emphatic: In an increasingly digital world, face-to-face discussions at a fair are crucial for inspiration, for thinking ahead together and for building up lasting partnerships. "A trade fair comes alive as soon as it is a place for opportunities," Arnd Hinrich Kappe observed. His comment reiterates ILM's ambition to move beyond a mere product show to being a catalyst for change and for the future of the industry.

The return of international brands further highlighted the significance of ILM. "We are back again for the first time in eight years and we are highly satisfied with our comeback. The fair gives us the opportunity to cultivate the German market afresh, as well as nurturing international contacts and building up new ones," Matthias Deguigne of the luggage vendor Delsey pointed out.


SECRID
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CONFIDENCE AND OPTIMISM

In spite of geopolitical and economic challenges, exhibitors and purchasers alike shared a largely optimistic perspective for the coming months.

The Future Hub was once again a central forum at ILM. With its panel discussions, talks on trends and practical insights, the communication platform provided fresh impetus for the new rounds of orders. After work events with live music in the trade fair foyer rounded off the programme.

TRENDS FOR THE COMING SEASON

What trends will be in demand for Spring/Summer 2026? Clear answers were provided by ILM's curated brand portfolio. One major focus will be on suede: "The softness of the material emphasises the nonchalance of the new bags with an especially distinguished effect in shades of brown," explains trend expert Dr.

Claudia Schulz. Besides which, pastel colours and natural nuances – above all light shades of cream offering versatile combinations – will be making their impact on the coming product range. Animal prints will remain popular, with cow and zebra patterns being added to the leopard print mainstay. And lightness, safety and smart technologies – suitcases and bags equipped with intelligent technology – will be taking centre stage when it comes to travel baggage and outdoor articles.

ILM #163 will take place from February 7 to 9. ILM #164 will follow from August 29 to 31, 2026.

Euro Shoes: The Fall Premiere That Set Trends and Raised Acute Questions for the Industry

From August 27 to 30, Moscow once again became the shoe capital:

The international exhibition Euro Shoes premiere collection was held in the Congress Center of the World Trade Center on Krasnopresnenskaya Embankment. For four days, the exhibition brought together leading global brands, buyers and industry experts, becoming a place where fashion trends are created and business alliances are formed.

Leading International brands from Europe, Turkey, the USA and Australia were presented at Euro Shoes: A separate event was the return of the cult brand El Naturalista. The exhibition guests got acquainted with dozens of fashion discoveries. The absolute hit of the exhibition were **"sneakers",** ultra-light sneakers on a thin sole, which were shown by several brands at once.

This season, the business part of the exhibition has turned into a full-fledged platform for professional dialogue. On the first day, Ozon representatives presented analytics on the development of the fashion category, revealed details of logistics and operational processes, and held an open discussion with sellers.

On the second day, the focus shifted to growth tools and industry regulation. Presentations were made by experts from Yandex Market, the Mindbox cloud platform, the Marketplace Guru consulting group, as well as representatives of key industry associations

The program culminated with a panel discussion where industry leaders met: The participants discussed current challenges: working with marketplaces, digitalization, updating market rules and the problem of counterfeiting. The dialogue was open and honest, which was noted by both speakers and listeners.

Euro Shoes ended on a high note: The exhibition was visited by thousands of specialists, dozens of contracts were signed and orders for new collections were placed. The atmosphere of inspiration and lively exchange of experience once again confirmed that Euro Shoes remains the main professional platform for the shoe industry in Russia and Eastern Europe.

The next edition will take place in February 2026.

Statement from Matt Priest, President and CEO of FDRA, on Latest CPI Footwear Data and Tariff Concerns

Footwear Inflation Hits 30-Month High, American consumers need relief

Matt Priest, President and CEO of Footwear Distributors and Retailers of America (FDRA), on 11th September 2025, has released the following statement:

> *"The latest inflation numbers show what families already know - shoes are getting more expensive. Footwear prices jumped 1.4% year-over-year, the most significant increase in 17 months, with women's shoes spiking 2.8%, the highest in two and a half years.*

Shoes aren't a luxury - they're a necessity. Yet tariffs keep driving up costs and forcing families to pay more. If the administration is serious about lowering costs, the fastest way to deliver relief is to roll back tariffs on shoes and other everyday essentials."

For background purposes:

- Inflation continues to gain traction. According to the latest Consumer Price Index released on this day morning, retail inflation rose 2.9% in August from a year earlier, the fastest increase in seven months and second fastest in fourteen months.
- August also marks the fourth straight month that inflation has *accelerated*.
- Gaining similar traction, retail footwear prices climbed a year-over-year 1.4% in August, the most in seventeen months and second fastest in thirty-three months.
- These footwear prices generally were higher across the target market.

  - That is, prices for women's footwear rose 2.8% in August-the most in thirty-four months-while children's footwear prices climbed 0.9%, the fastest so far this year.
  - Men's footwear prices edged -0.2% lower but have still risen in fourteen of the last nineteen months.
- Besides creeping inflation, another key driver behind rising footwear prices is onerous tariffs.
- These tariffs disproportionately impact the footwear market, given that more than 98% of footwear sold at retail is sourced abroad.
- In the latest month, duties paid on footwear imports soared a near-record 108.7% year over year to an unprecedented $635.8 million.
- The recent streak of surging duties paid on footwear imports strongly suggests retail footwear prices may climb even further.

Visit the FDRA website for more information.

Shoe Prices Continue to Climb in August, More Increases Expected as Tariffs Impact Footwear Imports

In August, retail footwear prices climbed 1.4 percent, the most in 17 months and second fastest in 33 months. Shoe prices increased in August in tandem with overall **inflation**, according to the latest data from the Footwear Distributors and Retailers of America (FDRA).

In August, retail prices of footwear climbed 1.4 percent, the most in 17 months and at the second fastest rate in 33 months, the FDRA noted.

This comes as prices were generally higher **across each target market** last month. Women's **footwear prices** increased 2.8 percent, the most in 34 months, while children's shoe prices ticked up 0.9 percent, the fastest so far this year. But men's **footwear prices** edged 0.2 percent lower in August but still have risen fourteen of the last nineteen months.

OrthoLite Lays the Foundation for Localized Foaming Capabilities in India

OrthoLite, a global leader in sustainable footwear solution has announced the official opening of the OrthoLite Foaming Plant, in Ambur, Thirupathur Dt, Tamil Nadu in India. This key milestone marks a significant step forward in OrthoLite's strategy to localize the entire product creation process from end to end while strengthening our service and production capabilities to better support regional and global brand partners.

Led by Country General Manager Vikash Bajargyan, the new facility brings OrthoLite's signature comfort and performance foams to the heart of India's vibrant footwear manufacturing region. With a modular plant design, the facility enables rapid scaling and agility to meet dynamic market needs. Local production reduces lead times and enhances supply chain resilience, while OrthoLite's global quality standards ensure consistency and excellence across every batch.

"Our team in India is excited to deliver faster turnaround and unmatched product quality, directly aligned with OrthoLite's global

standards. By investing locally, we're able to provide more responsive service and sustainable solutions for our partners throughout the region," said Bajargyan.

The plant will emphasize sustainability in all operations-including energy-efficient production, waste and water stewardship, and circular practices that help minimize environmental impact. An on-site laboratory ensures rigorous quality control, and dedicated safety modules support a culture of looking out for its people and the planet.

OrthoLite India will focus on ensuring consistency across all foam formulations, assuring the highest standards while qualifying new programs, reducing scrap, and launching advanced digital monitoring tools for transparency and reliability. With this strategic expansion, the company is positioned to deliver high-performance comfort solutions locally for global brands.

Cirql® Expands Family of Recyclable Midsole Innovations with Cirql rTPU50

Cirql®, a leader in sustainable materials for the global footwear industry, is a subsidiary of OrthoLite®. It is focused entirely on developing scalable and less impactful finished component and material solutions for footwear. Cirql® has now introduced Cirql rTPU50—the newest addition to its fully recyclable midsole collection. This patented material is made with 50% GRS-certified post-industrial recycled TPU and produced using a chemical-free, supercritical foaming process. With 25 granted patents and dozens more pending worldwide, Cirql rTPU50 offers a scalable, fully recyclable midsole solution that empowers footwear brands to meet their climate and sustainability goals.

The global footwear industry is navigating an unprecedented regulatory environment, marked by stringent compliance demands and new legislation defining sustainability standards for product and messaging.

Cirql expands material optionality for footwear brands committed to building footwear with fully-recycled circularity. rTPU50 exceeds 2025 compliance standards by incorporating 50% GRS-certified, post-industrial recycled TPU materials directly into the foam using a patented supercritical manufacturing process.

“Our mission is to keep shoes out of landfills, first and foremost, and with Cirql’s rTPU50 we add another solution for footwear designers, brands and product creators committed to building circular footwear,” said Matt Thwaites, Vice President and General Manager of Cirql. “We are proud to offer footwear brands yet another trusted midsole material that will empower developers to build products that are aligned with climate goals.”

Cirql is committed to transparent, verifiable claims on its materials and processes. In November 2024, Cirql’s Vietnam factory obtained GRS certification.

Cirql rTPU50 is third-party tested and is available as a finished component or as polymer. Additionally, Cirql adds the option of a co-molded TPU outsole which removes the current bonding process, delivering a glueless, single material bottom unit. Cirql’s midsole foams can also be conventionally bonded to all outsoles on the market today.

Cirql's sustainable solutions for supercritical foams have currently dozens of patents filed worldwide.Of those patents, 25 are granted and in effect, with more on the way.

“We’re committed to authentic circularity by shrinking carbon emissions, offering next-generation sustainable material solutions, and eliminating hazardous substances from manufacturing, with traceability and trust,” said Thwaites. “We’re energized by the possibilities ahead and look forward to sharing more exciting Cirql developments this year.”

Best suited for lifestyle, casual, recovery, safety and golf footwear, Cirql rTPU50 will be available to footwear brands in Q3 2025. For additional information on Cirql, please visit https://cirqlinnovations.com/.

Brazilian Footwear Manufacturers Worry Decline in Exports and Increase in Chinese Imports

August's performance was strongly affected...

According to the data compiled by the Brazilian Footwear Industries Association (Abicalçados), in August, reveal alarming figures for the sector. While exports continue to decline-now further impacted by the 50% tariff imposed on Brazilian products in the United States-imports are on the rise, particularly those coming from China.

In August, footwear exports totaled 7.64 million pairs, generating US$ 77 million-representing declines of 0.5% in volume and 9.1% in revenue compared to the same month last year...

August's performance was strongly affected by results in the United States, the main international destination for Brazilian footwear. In the eighth month of the year, exports to the U.S. reached 803.7 thousand pairs and US$ 21.4 million, representing declines in both volume (-17.6%) and revenue (-1.4%) compared to the same month in 2024. Year-to-date, shipments to the U.S. totaled 7.7 million pairs and US$ 156.3 million, reflecting increases of 10.7% in pairs and 5.8% in revenue compared to the same period in 2024.

"The tariff imposed by the United States-a country that accounts for more than 20% of all Brazilian footwear exports-was already felt in August. In September, when we will have a full month under the additional tariff, the setback is expected to be even greater," laments Abicalçados' Executive President, Haroldo Ferreira. According to him, the tariffs make Brazilian exports "virtually unviable" when faced with fierce competition from Asian suppliers, especially the Chinese, in that market.

The second-largest destination for Brazilian footwear this year is Argentina, which in August imported 1.63 million pairs worth US$ 18.44 million-representing increases of 68% in volume and 11.6% in revenue compared to the same month last year. Year-to-date, exports to the country reached 9.35 million pairs, generating US$ 135.68 million, growth of 37.4% in volume and 5.3% in revenue compared to the same period in 2024.

Paraguay ranks third among the main destinations for Brazilian footwear abroad. In August, the country imported 876.9 thousand pairs from Brazil for US$ 4.3 million, increases of 41.4% in volume and 23.5% in revenue compared to the same month last year. Year-to-date, Paraguayan imports reached 5.95 million pairs and US$ 27.7 million, reflecting an 8.7% increase in volume but a 1.7% decrease in revenue compared to the same period in 2024.

Among Brazil's leading footwear-exporting states year-to-date are Rio Grande do Sul, with 21.4 million pairs and US$ 315 million-an increase of 1.1% in volume but a 4% decline in revenue compared to the same period last year; Ceará, with 21.33 million pairs and US$ 127.73 million-an 8.4% increase in volume but a 5% drop in revenue; and São Paulo, with 4.73 million pairs and US$ 68.2 million-representing increases of 26.5% in volume and 18.6% in revenue.

Chinese Invasion

With imports on the rise, Abicalçados highlights the surge of Chinese footwear entering the country. "With the tariff imposed by the United States on Chinese products, producers from that country have been redirecting their surpluses to other markets-including Brazil-at very low prices," explains Ferreira, emphasizing that this situation creates an uneven competitive environment in Brazil's domestic market, causing losses for the national industry.

In August alone, 492 thousand pairs of Chinese footwear entered Brazil, worth US$ 3.7 million-an increase of 41.5% in volume and 67.2% in revenue compared to the same month in 2024. Year-to-date, imports from China totaled 8.45 million pairs and US$ 31.18 million, representing increases of 9% in volume and 14.1% in value compared to the same period last year.

In total, footwear imports in August reached 3.55 million pairs and US$ 49.27 million-an increase of 23% in volume and 18.4% in revenue compared to the same month in 2024. Year-to-date, imports totaled 30.13 million pairs and US$ 387 million, reflecting growth of 26.9% in volume and 28.8% in revenue compared to the same period last year.

China sees decline in leather industry revenue

From January to June 2025, China's leather industry revenue decreased by 0,8% year-on-year, according to data released by Li Yu Zhong, vice president of China's leading leather association CLIA, at the All-China Leather Exhibition (ACLE), an annual trade fair held in Shanghai from September 3 to 5.

The challenges facing businesses in China are the same as in Europe: demand for finished goods remains low, and the situation is exacerbated by the negative impact of geopolitical tensions and the trade war unleashed by the Trump administration. The consequences of this are felt on trade and trade turnover across the cluster.

According to International Leather Maker, revenue from the sale of leather and leather products in China in the first half of the year amounted to 49, 2 billion euros, of which 37 billion euros came from exports. Thus, the volume of foreign sales decreased by 7,8%. The situation with imports was worse (6,4 billion euros), the decrease was 13,6%.

Key Changes in TFL´s Leadership Team

TFL announces important leadership updates that will further strengthen the company's position and support its long-term growth strategy.

Samer Al Jabi, CCO

Effective September 1, 2025, **Samer Al Jabi** will assume the role of **Chief Commercial Officer (CCO).** Samer has been with TFL since March 2025 and has been instrumental in leading TFL's five-year strategic plan. In his new role, he will drive the company's growth through commercial excellence and strategic initiatives. With his extensive experience in the chemical industry, Samer has successfully led global businesses, built high-performing teams, and executed transformative acquisitions. His leadership and vision will be key as we enter this next phase of growth.

Effective July 1, 2025, **Kaija Korolainen** was appointed Group **Chief People Officer (CPO).** Kaija has a strong track record of strategic HR leadership across multiple industries and geographies. At TFL, she is responsible for leading the people strategy, with a focus on building an inclusive, high-performing culture and driving organizational excellence to enable the successful execution of TFL's strategy.

Kaija Korolainen, CPO

Our valued **COO, Henrik Pedersen** has decided to retire on January 1, 2026, after nearly 21 years with TFL in various key roles. We have launched a search to find a successor for him.

LINEAPELLE AND SIMAC TANNING TECH

(FIERA MILANO RHO, FROM SEPTEMBER 23 TO 25, 2025):

STRATEGIC ALLIANCE FOR THE LEATHER AND TECHNOLOGY SUPPLY CHAIN

Integrated programs and international development to strengthen Italian fairs and face the crisis

At the headquarters of the Italian Trade Agency, on 11th September, a presentation of **LINEAPELLE** and **SIMAC TANNING TECH** editions was held. These two fairs will take place at Fiera Milano Rho from September 23 to 25, 2025. The event featured the participation of the fair's top management and important institutional representatives: **Matteo Zoppas**, president of the Italian Trade Agency; **Fabrizio Lobasso**, deputy director general, central director for Economic Internationalization at the Ministry of Foreign Affairs and International Cooperation; **Roberto Luongo**, advisor for International Trade and Made in Italy to Minister Adolfo Urso, head of the Ministry of Enterprises and Made in Italy.

A synergy lasting 40 years

LINEAPELLE and SIMAC TANNING TECH, with a synergistic history of over forty years, are an excellence in the Italian and international fair scene. They represent the highest and most concrete expression of the commitment of the reference associations, **UNIC – Italian Tanneries** and **National Association of Italian Manufacturers of Footwear, Leathergoods and Tanning Technologies**, in promoting and protecting two strategic production sectors of Made in Italy for the global fashion industry, design, luxury, and automotive: the tanning industry and the industry of technologies for the production of leather, footwear, and leather goods accessories.

Shared vision for common competitiveness

LINEAPELLE and **SIMAC TANNING TECH** return to Fiera Milano with a joint objective: to support the leather-fashion system and its technologies through an **integrated fair platform and a shared evolution path**, able to offer buyers, operators and international stakeholders a distinctive and unique fair experience. LINEAPELLE and SIMAC TANNING TECH represent a manufacturing community made up of more than 1,450 exhibitors and brands, from over 40 countries, spread over a total area of 54,400 square meters for an expected attendance of about 30,000 professional operators.

A persistently suffocating economic situation

In 2025, supply chain companies continue to face contractions in volumes, revenues, and margins, with dynamics reflecting structural characteristics. Fundamentally, the persistent slowdown of global fashion and luxury demand - main sales destinations - aggravated by trade tensions, particularly with the United States, and by an increasingly unstable geopolitical scenario. In the first half of the year, the national sectors of Assomac and UNIC – Italian Tanneries

registered a contraction of exports, with a decrease of 12.8% for technology and machinery, and 4% for tanning, respectively. Other LINEAPELLE exhibition sectors are also suffering: accessories and components in particular, while fabrics and synthetics contain the drop.

A strategic collaboration

LINEAPELLE and SIMAC TANNING TECH represent a strategic opportunity to showcase sector innovations and, above all, to enhance Italian manufacturing know-how. To further consolidate the commitment of the fair bodies, on the opening day (Tuesday, September 23) a **collaboration agreement** will be formalized to strengthen the supply chain bond and offer a complete and integrated representation: from technologies for the processing of leather and products, to tanning auxiliaries, materials, accessories and components for the fashion, luxury, furnishing and automotive sectors.

The **collaboration priorities** concern the promotion of continuous improvement of production processes, the creation of an exhibition area dedicated to the most advanced solutions and the strengthening of presence in foreign markets through missions and scouting activities, supporting technology transfer and expanding the sectors represented at the fair.

A laboratory of the future

«LINEAPELLE – explains **Fulvia Bacchi**, CEO of LINEAPELLE and general manager of UNIC – arrives at the September 2025 appointment structurally strengthened not only in its role as a reference commercial event for the global supply chain, but also, and above all, as a **constantly evolving laboratory of the future**. Thanks to a long-term vision, LINEAPELLE proposes itself as the place of excellence where to activate virtuous creative and business

connections. Product and stylistic innovation, fashion and training, artificial intelligence and artisanal engineering: LINEAPELLE takes on the responsibility at every edition to define and deepen the evolutionary paths for the supply chain. A goal that, through the synergy with SIMAC TANNING TECH, creates even more stimulating and concrete future horizons».

A platform dedicated to the supply chain

«Ongoing market conditions make medium- and long-term strategic planning and investments challenging. For this reason, an evolution of SIMAC TANNING TECH is essential – highlights **Mauro Bergozza**, president of Assomac and Assomac Servizi s.r.l., organizing entities of the exhibition – as a business platform and as a space focused on innovation and research. Building a **unique place dedicated to the supply chain is a duty for our Made in Italy**. If we want to defend the excellence of our event, the only one in the world that puts manufacturing technologies at the center for manufacturing in fashion, automotive and furnishing, and defend the Italian market share, amounting to 30%, of the global interchange of technologies and machinery, we need a strong fair, actually two, moving united, convinced that this is the only way to counter the competition of Eastern countries».

Africa horizon

Strong attention will be given to the African continent, in line with the priorities of the Piano Mattei and considering current and potential development trends. The presence of a considerable number of delegates during the events and planned appointments confirms its importance.

https://assomac.it/en/

BASF presents new materials, concepts and recycling methods for polyurethanes in footwear at SIMAC Tanning Tech..

BASF will showcase their unique and integrated toolbox of Elastopan® (PU) and thermoplastic polyurethanes Elastollan® and Infinergy®at their Booth Hall 10, G 56/H55.

The concept of meltable PU is an essential step forward towards a circular future of footwear: Bottom units, upper parts or even complete shoes made of meltable PU or combinations of TPU and PU are ready for mechanical recycling concepts. The new TPU Elastollan® RC with up to 100% recycled content can be used as a raw material for new shoe parts. “Alongside this concept, we are unveiling further strategies for circularity: by utilizing depolymerization, both post-industrial and post-consumer footwear waste can be incorporated into new polyurethane shoe soles. Alternatively, ChemCycling® enables us to achieve up to 100% attributed recycled feedstock by utilizing end-of-life tires or mixed plastic waste”.

SpringPURe products feature low density without sacrificing durability and performance you expect from polyurethane. “ Whether you’re after the bouncy flexibility of polyether-based materials or the easy processing of polyester-based options (perfect for top-tier safety shoes), SpringPURe has it all. We support all the latest production methods, from classic casting to **direct injection**.”

Experience the next level of automated footwear creation with our collaboration alongside Desma Schuhmaschinen GmbH. Together, we’re rethinking design flexibility and enhancing lightweight comfort-showcasing concepts such as direct soling with Elastopan®SpringPURe lightweight midsoles combined with robust Elastollan® TPU film outsoles. Explore the possibilities of fully automated PU processing, paired with the dynamic elasticity of Infinergy®, resulting in exceptional midsoles crafted in a single step. The classic "Detonate" cupsole concept brings tradition into the future, utilizing foamed TPU to achieve adaptable densities and superior performance. Meanwhile, Desma’s cutting-edge SCF machine streamlines production to deliver ultra-light Infinergy® midsoles with outstanding elasticity and energy return.

ACLE 2025 came to a successful close

Showcasing Innovation and Global Opportunities for the Leather Industry

The 25th edition of the All China Leather Exhibition (ACLE) ended with good results at the Shanghai New International Expo Centre (SNIEC) after three days of successful run from 5-7 September, 2025, presenting innovation and again reaffirming its role as the leading global leather industry event in China.

The fair organised in over 80,000 square meters hosted nearly 1,000 exhibitors who welcomed more than 32,000 professional buyers. Together, they created a vibrant industrial gathering that highlighted technological innovation, sustainable practices, and forward-looking academic exchanges.

The products on display at the event include traditional salted hides, wet blue, crust, finished leather, synthetic materials, and components. A special emphasis this year's fair placed special emphasis on innovative fashion technologies, functional materials, and eco-friendly, low-carbon solution was seen at this edition.. These offerings opened new growth opportunities for buyers in footwear, fashion accessories, automotive and furniture upholstery, and sportswear.

During the fair days, ACLE hosted a full range of academic, business, and interactive activities. The International Leather Industry Summit and the UITIC International Footwear Technology Congress provided platforms for global dialogue, while the Launch of New Products and Technologies shed light on the future of leather, machinery, and chemicals.

The exhibition took place amid a complex backdrop for the global leather industry. Economic slowdown, low consumer confidence, energy and labor shortages in some regions, declining orders for footwear and apparel, volatile hide prices, and rising environmental costs continue to impact the market. To remain competitive, the

sector must reduce costs, improve efficiency, and accelerate its transition toward greener, smarter, and more sustainable development.

Despite these pressures, exhibitors remained optimistic and buyers said the fair provided a comprehensive platform and were immensely benefited from the technical sessions and seminars which provided early insights into emerging trends and risks shaping the industry's future. Amid global economic crisis and growing geopolitical uncertainty, ACLE 2025 promoted collaboration across the supply chain, encouraged the adoption of eco-friendly processes and smart equipment, and solidified its position as a key hub that connects resources, energizes the industry, and defines its future competitiveness.

The next edition will take place from 1-3 September, 2026.

Back-to-School Column

Dr. N K Chandra Babu

Chrome Tanning – Part I

Tanning is the important unit operation in leather making as it imparts permanent preservation of hides and skins against bacterial degradation and only after this process skin/pelt becomes leather. Plant based polyphenolic materials (vegetable tannins) have been used for the purpose since time immemorial. Alum tanning is also one of the oldest tanning systems recorded in the history of leather. Though many materials and chemicals have been screened and used for tanning, chrome and vegetable tannins are the most popular among them. Even today, vegetable tanning is the most sought after tanning for heavy and industrial leathers on account of its ability to produce fuller, compact and firmer leathers with high degree of abrasion resistance and least stretch required for many of these leathers.

For example, sole leather requires high degree of abrasion resistance which is linked to its durability whereas the harness and belting leathers require high degree of tensile strength with least stretch. These are two of few leathers, which are subjected to linear tensile stress during their usage. Though use of leather for many of these end uses is on the decline, vegetable tanning reigns supreme as the main tanning system for these types of leathers wherever they are produced. Aldehyde in combination with fish oil is the best tanning system and is the only tanning system followed for chamois leather even today on commercial scale. High degree of water absorption and ability to clean very sensitive surfaces/materials like glass and diamond without leaving scratches, and washability are the most important properties enjoyed by chamois leather.

The important uses of chamois leather include aviation fuel filtration, diamond and other precious jewellery polishing and glass window cleaning (the brushes made out of chamois leather trimmings are used in automatic car washing machines).

The mechanism by which various tanning systems imparts resistance against bacterial degradation is not well understood though many theories have been put forward by researchers to explain this. The most logical explanation is that the tanning materials bring about changes in the substrate either at molecular level or at microstructure or macro levels such that bacteria or the enzymes secreted by them do not recognise the substrate any more but the method through which they achieve this may be unique to each one of them. Some of the mechanisms proposed include cross linking, deposition and fibre coating with effective blocking of active sites in the collagen supramolecule prone for attack by bacteria, reduced availability/accessibility of hydrophilic functional groups due to reaction with tanning materials, even tanning materials acting as biocides against bacteria. Cross linking leading to high hydrothermal stability is considered important but this cannot explain bacterial resistance in oil tanning with which there is no increase in hydrothermal stability. Some researchers talk about minimum shrinkage temperature of 62^{o} C being necessary for imparting bacterial resistance.

Apart from the ability to confer resistance against bacterial and enzymatic activity, drying out soft, reduced swelling characteristics, increased hydrothermal resistance and increased hydrolytic resistance are also considered important hallmarks of good tanning and the degree to which this is achieved varies from one material to another.

Chrome tanning was discovered in the middle of 19th century and introduced in commercial practice only in last decade in 19th century but went from strength to strength to completely replace plant based tanning materials as main tanning system for many end uses.

Currently, chrome tanning is the most popular tanning method followed word over, and more than 90% of the leathers produced globally go through chrome tanning. The advantages enjoyed by chrome tanning over other tanning systems such as ease of doing, faster process compared to vegetable tanning, high hydrothermal stability, excellent dyeing characteristics, high affinity for fatliquors etc., make it a versatile tanning system for the production of leathers suitable for many end uses. Chrome tanning offers itself the most suitable for the production of soft and very soft leathers like garment and glove leathers. Currently, even upper leathers are increasingly expected to be extremely soft, and the softy and nappa upper leathers and newly christened 'floaters' are in great demand in International market. It is technologically challenging to produce soft leathers without going through chrome tanning.

The advantages enjoyed by chrome tanning over other tanning methods may be better understood by its chemistry. Among the metal ions, Aluminium (III), Zirconium (IV) are used in small way for tanning mostly in combination with other tanning systems. Titanium (IV) complexes have also been screened for tanning but it has not received any serious attention commercially. Iron (III) tanning was also discovered at the same time as Chromium (III) but was never commercially accepted as it suffers from many disadvantages. Among the organic systems, use of formaldehyde has been phased out; other aldehydes such as gluteraldehyde and glyoxal and aldehyde derivatives like oxazolidine and phosphonium tanning agents are recommended for use in combination vegetable tannins for the production of full organic tanned leathers.

Chromium chemistry relevant to leather technologists

Chromium is a transition metal belonging to group 6(VIB) in periodic table. The most common source of chromium is chromite ore in which chromium is present as chromium (III) ion. In ore dressing, Chromium in the chromite ore is converted to soluble hexavalent chromium (chromate/dichromate) by thermal treatment at high

temperature from which many chromium (III) compounds including basic chromium (III) sulfate used in tanning are produced. The process flow diagram for the preparation of dichromate starting from chromite ore is summarized in the following figure.

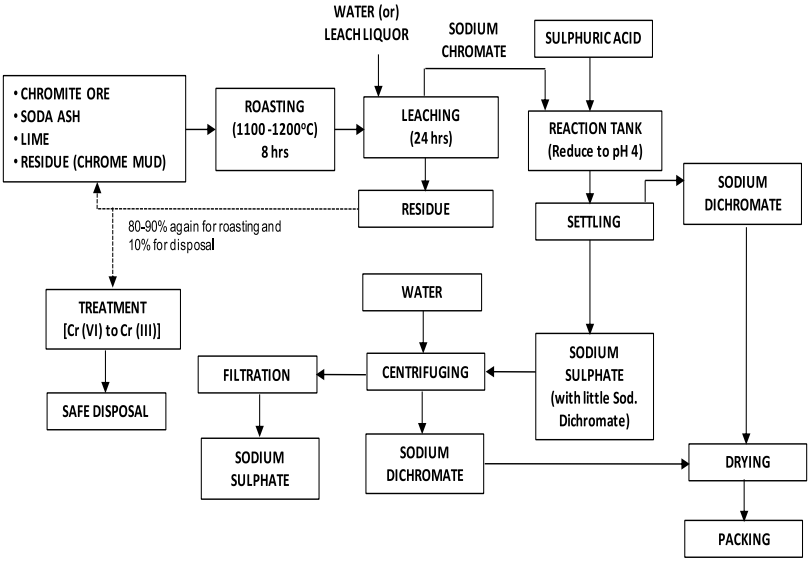
Manufacture of Sodium Dichromate

$$2(Cr_2O_3) + 4Na_2CO_3 + 3O_2 \xrightarrow{1200^oC} 4Na_2CrO_4 + 4CO_2$$

$$2Na_2CrO_4 + H_2SO_4 \rightarrow Na_2Cr_2O_7 + Na_2SO_4 + H_2O$$

(b) Process description:

Process scheme for the manufacture of sodium dichromate is shown in Figure.



Chromium (III) is characterized by its d orbital electronic configurations like any other transition metal ion, and it has d^3 configuration. The metal ion undergoes d^2sp^3 hybridization with the formation of octahedral complexes in aqueous solution. Thousands

of such complexes have been prepared, many of which are kinetically inert. The chromium (III) owes its kinetic inertness to its $3d^3$ electron distribution. Such distribution of charge in d orbitals (one unpaired electron in each of three d orbitals leaving the other two orbitals free) makes substitution reactions in chromium complexes very slow. The substitution reactions with many of chromium complexes have half times in the range of several hours.

Chromium (III) like many transition metal ions tends to form polynuclear complexes in aqueous solutions due to hydrolysis with dimer, trimer and tetrameric species being common. The extent of hydrolysis and polymerization increases with addition of bases and ultimately culminate in the precipitation of chromium as $Cr(OH)_3$. The polynuclear complexes are many time hydroxo bridged (referred to asolated complexes). When these hydroxo bridged complexes are heated, oxygen bridged polynuclear complexes are also formed and are referred to as oxalated complexes. Bridging by anions such as sulfate happens quite often by replacement of aqua and OH in the complex by penetration of ionic sulfate into complex. Many such anions capable of forming complexes with chromium penetrate into basic chromium complexes. The extent to which anion can penetrate into basic chromium complexes depends on the ease with which the anions can contribute a pair of electrons needed for complexation reaction. The complexing tendency of many anionic ligands decreases in the following order.

Oxalate > glycinate > tartarate > citrate > glucolate > acetate > formate > sulfate > chloride > Nitrate > perchlorate.

Consequently, the use of highly coordinating anions can considerably reduce the extent of olation in basic chromium (III) aqueous solutions and polymerization and can considerably increase the precipitation pH as well as reducing the reactivity of chromium. The anionic ligands such as acetate and formate are used in chrome tanning for increasing the precipitation pH and reactivity of Cr(III) to get quicker penetration and uniform distribution of chrome in tanning.

This is called masking in tanners' parlance. The anions with the higher degree of coordinating capacity and chelating tendency such as oxalate and citrate are used for producing anionic chromium complexes which can find use in pickle-less chrome tanning carried out at high PH.

Due to partial filling of d orbitals, there is a split up of energy levels between these 5 supposedly equal energy orbitals under the influence of ligand field and the extent of split up of energy levels vary from one ligand to another. This gives rise to possible d-d transition with the absorption of light energy in the visible range, and this is the reason for many of the chromium complexes being intensely colored.

Chromium (III) ion due to its d^3 electronic configuration is basically considered inert a mentioned earlier, which means that it is very sluggish in entering into complexation reaction with side chain carboxyl groups of aspartic and glutamic acid in collagen. These carboxyl groups in ionized form can donate a pair of electrons for the formation of coordinate covalent (called complexation reaction in transition metal chemistry). To speed up the reaction with collagen molecule in skin matrix, basic chromium sulfate is used for tanning. The basic chromium sulfate tanning salt (33% basicity is commonly used) is simply called as 'chrome' in tanners' parlance. 33% basic chromium sulfate has one hydroxyl group per chromium atom in the molecule. The reactivity of chromium (III) is many times enhanced in 33% basic chrome compared to 0% basic salt.

In the old two bath chrome tanning method, the delimed pelt is treated with a mixture containing dichromate (hexavalent chromium), sulfuric acid and common salt and in the second bath, Cr(VI) is reduced to Cr(III) using reducing agents such as molasses/sugars/glucose. Today, nowhere, two bath chrome tanning is done in commercial practice and has been completely replaced by single bath chrome tanning wherein ready to use 33% Basic chromium sulfate tanning salt is directly used. Some tanneries used

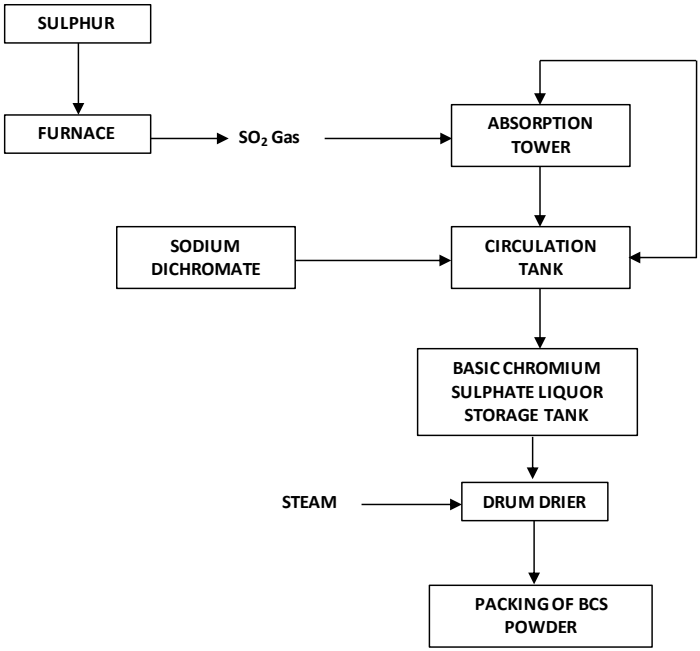
to prepare their chrome tan liquors in their premises and this author has witnessed one large tannery in Jalandhar preparing their own chrome liquor till 1995 but it has been completely stopped now by the order of Pollution Control Authorities.

The methods of preparation of chrome extract starting from sodium dichromate as being carried out by BCS manufacturers are summarized in the following process flow diagrams. Either sulfur dioxide or cane sugar/molasses is used as reducing agent.

1. **Manufacture of Basic Chromium Sulphate (BCS) using** SO_2 as reducing agent

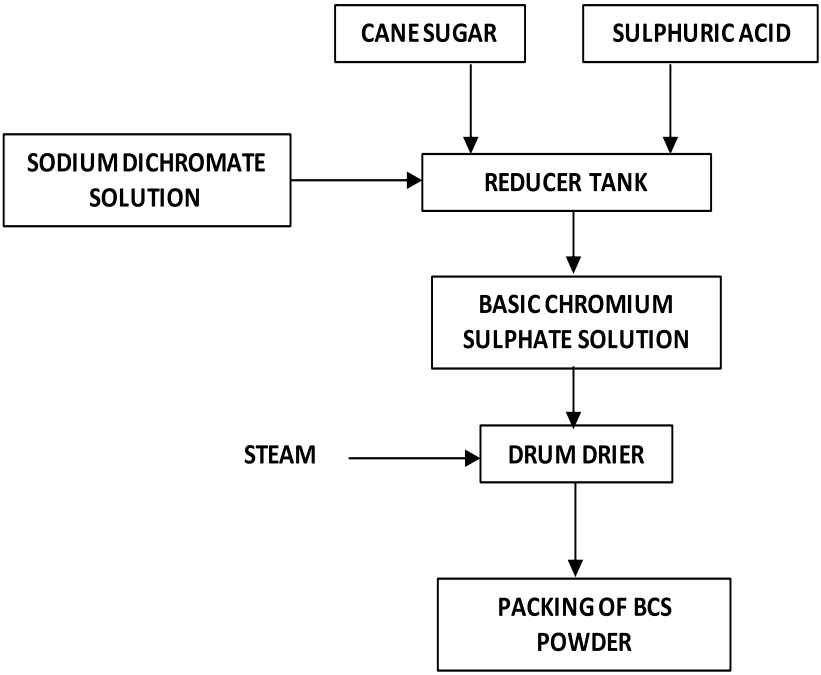
$$2Na_2Cr_2O_7 + 3SO_2 + H_2O \rightarrow 2Cr(OH)SO_4 + Na_2SO_4$$

Process scheme for the manufacture of basic chromium sulphate by sulphur dioxide method is shown in the following figure.



2. **Manufacture of Basic Chromium Sulphate (BCS) using cane sugar** as reducing agent

$$8Na_2Cr_2O_7 + 24H_2SO_4 + C_{12}H_{22}O_{11} \rightarrow 16Cr(OH)SO_4 + 8Na_2SO_4 + 12CO_2 + 27H_2O$$



Introduction to mechanism of chrome tanning

One of the main reasons cited by many researchers for the superiority of Cr (III) over other transition metal ions for tanning is that it forms polynuclear complexes of intermediate size and stability. Size of the complexes should be sufficient enough to enter into interfibrillar space in order to bring about crosslinks but it should not be too big so that complexes are not able to diffuse well and distribute uniformly to effect sufficient stability. With many metal ions, the size becomes so large even in acidic pH condition, there is a

problem with water solubility leading to precipitation and surface fixation. Even with Cr (III) tanning complexes, the pH becomes critical to get good diffusion and uniform distribution throughout cross section to effect good tanning.

The ideal pH range for chrome tanning has to be carefully chosen taking into consideration the hydrolytic behaviour of Cr (III) in aqueous solution as well as the pK of the side chain carboxyl groups (from aspartic and glutamic acids) in collagen in skin matrix, which are involved in reaction with chromium. Considering these factors, conventionally chrome tanning is started at pH below 3.0 and finished at 3.8-4.0 and hence obviously there is a need for pickling prior to tanning. The mechanistic aspect related to chrome tanning including the stability aspect will be dealt in detail as Part II in next column.

For any feedback, mail to babunkc@yahoo.com

Leather Auxiliaries – A Review PART – II

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(Contd. from August issue)

27. Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 A

1. ZEOLOGY, THE SUSTAINABLE TANNING CONCEPT

Objective: Creating a sustainable tanning concept and superior leather performance

Zeology is a truly sustainable alternative to existing tanning agents. It is zeolite based and therefore chrome-free, heavy metal-free, and aldehyde-free.

It delivers both sustainability benefits and superior leather performance. Zeo White, the Zeology-tanned leather intermediate, is unsurpassed in characteristics such as grain tightness, physical leather properties, lightfastness, and heat resistance. In addition, its bright white color enables white leather, as well as lighter and brighter colors than were ever possible before.

2. PROVIDING BIO-BASED SOLUTIONS

Objective: Valorisation of bio-based side streams

Through bio-based solutions, implementing a substantial component of the concept of the circular economy around leather chemicals and to support leather manufacturers in reducing their footprint. The current focus is on replacing petroleum-based ingredients with bio-based alternatives. These alternatives should deliver on-par or even better results and help make the leather chemical sector more sustainable, reducingCO_2 emissions from production and reducing non-degradable and toxic substances

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 B

3. LIFE BIOPOL

Objective: Synthesis of a new class of products

LIFE Biopol's main target was the synthesis of a new class of products, named biopolymers, which represent innovative and eco-friendly alternatives to traditional petrochemical products used in the leather production process. These biopolymers are produced using industrial low or no value side streams as raw materials, in order to enhance the circularity across different industrial sectors. These products appeared on the market in 2020 (Biopol range) supporting leather manufacturers to create leathers with a high degree of renewable ingredients.

4. LIGNIN MODIFIED RE-TANNING AGENTS

Objective: Improving the biodegradability

Since 2019 Smit & Zoon has a patent-pending novel process to use lignins to modify re-tanning agents. The aim is to increase the renewable content and improve the biodegradability of phenolic syntans through (partial) replacement of phenol with industrial lignins by modifications of traditional phenolic syntan chemistry.

The first prototypes with this sustainable technology, made in 2020, achieved to be free from phenol and formaldehyde, increased renewability, improved biodegradability, and yielded good leather properties in comparison to traditional fossil-based phenolic syntans.

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 C

5. BIOPOLYMERS BASED ON SUGAR BEET PECTINS

Objective: Creating bio-based ingredients

Working with Wageningen Food & Biobased Research, and with Royal Cosun, a processor of beet pulp, Smit & Zoon has found that pectins from sugar beet pulp are suitable as bio-based ingredients in the production of leather.

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 C

These pectins serve as substitutes for non-biodegradable polymers in chemicals for the wet-end production process. They can also influence the characteristics of finished leather, for example, its color intensity. As a direct result of our own research, Smit & Zoon has a patent application on the usage of pectin for leather processing in general.

6. OPTITAN

Objective: Minimizing the environmental impact, while optimizing leather performance

Optitan is a premium range of (re-)tanning products with the highest achievable active matter contents with no diluents. Optitan has minimalized free formaldehyde and phenol

contents in the product due to upgraded chemistry

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 D

7. PFC-FREE WATER REPELLENT LEATHER COATING

Objective: Eliminating hazardous substances from our product range

In line with our program to eliminate hazardous substances from our product range, we developed and introduced Aguastop W200, the new generation for water repellent finishing products. An interaction between material science technology and special functionalized polysiloxanes allowed us to engineer a completely PFC-free product. This improved, water-based product gives anti-soiling and protection against water in a more sustainable way.

8. RESTRICTED SUBSTANCES

Objective: All products to comply with (M)RSL

Since 2016, Smit & Zoon has its own Restricted Substances List (RSL). This is a list of substances not present in any of our products. A steering group reviews and updates the Smit & Zoon RSL annually, taking into account the

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 D

following sources and criteria: Candidate List of Substances of Very High Concern (ECHA); Authorization List (Appendix XIV of REACh); List of Restrictions (Appendix XVIII of REACh); Manufacturing Restricted Substances List (MRSL of ZDHC).

The Smit & Zoon RSL remained unchanged, apart from changes in the official EU lists, which were, of course, included.

Additionally, we are proactively eliminating unwanted substances that are not (yet) on the list of restricted substances. Substances to be eliminated are selected based on their hazard and on information from the market.

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 E

9. OPERATIONAL EFFICIENCIES

Objective: No negative impact from Smit & Zoon production processes

In 2020 we finalized a 3-year project on “aging”. Like many chemical companies in The Netherlands, we have parts in our plants in Weesp and Amersfoort that are relatively old. The Dutch safety authorities require chemical companies to have a clear approach to controlling risks that are related to aging equipment and installations. We have made an extensive assessment of the safety, environment, and business continuity for all storage and process units. Based on this, we have set up multi-year plans for the upgrading of the maintenance programs and the replacements. The execution of the plans started in 2020. With this approach, we are confident that we can keep guaranteeing safe, compliant, and reliable operations in the interest of all stakeholders.

Projects were started to finalize that all global production plants are certified for ISO 9001 (quality management), 14001 (environmental management), and 45001 (safety management) in 2021.

Smit & Zoon - Milestones 2020- Reducing the Footprint & TOWARDS CIRCULARITY Table – 27 F

10. PRODUCT PASSPORT

Objective: Reducing waste in the leather value chain

In 2020, we continued to inform customers about the use of the Product Passport. Even though every leather manufacturer represents a unique production process, the Product Passport continues to get positive feedback in optimizing the Wet-End production for the whole industry. Providing these detailed data to a leather manufacturer is crucial in making the right decisions around the most sustainable production, reducing waste while using most suitable chemical products.

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28. CLRI – Technology - Leather Processing, Leather Chemicals, Enzymatic Products, Environmental Technology, Health care products

Figure – 28 A

Contents

S.NO	NAME OF THE TECHNOLOGY	CODE NO.
	CATEGORY I - LEATHER PROCESSING TECHNOLOGIES	
1.	WATERLESS CHROME TANNING TECHNOLOGY (WCTT)[C]	LMT01
2.	PRESERVATION-CUM-UNHAIRING (PCU) PROCESS[H]	LMT02
3.	ODOR ABATEMENT SYSTEM FOR TANNERIES[H]	LMT03
4.	EO BASED ZERO WASTEWATER DISCHARGE PROCESS[C]	LMT04
5.	DRY TANNING (DISPERSING AGENT)[C]	LMT05
6.	RAPID FIBRE OPENING BY COCKTAIL OF ENZYMES[H]	LMT06
7.	CHICKEN FEET LEATHER AND LEATHER PRODUCTS[C]	LMT07
	CATEGORY II - LEATHER CHEMICALS	
8.	RETANNING CUM LUBRICANT AGENT - RELUB-17[H]	LCT01
9.	RETANNING AGENT PROTAN KH[H]	LCT02
10.	PROTEIN BASED RETANNING AGENT CROSTAN EA[H]	LCT03
11.	PROTEIN BASED RETANNING AGENT DERMATAN RT[H]	LCT04
12.	CHROME –MELAMINE SYNTAN[C]	LCT05
13.	RETANNING AGENT NANOTAN NP[H]	LCT06
14.	LIGNIN BASED RETANNING AGENT[H]	LCT07
	CATEGORY III – WASTE MANAGEMENT TECHNOLOGIES	
15.	IMMOBILIZED OXIDATION REACTORS (IOR) FOR WASTEWATER TREATMENT[C]	TWM01
16.	SOLE FROM FLESHING'S WASTE[H]	TWM02
17.	SEQUENTIAL OXIC-ANOXIC BIO REACTOR (SOABR) TECHNOLOGY FOR REDUCTION OF PRIMARY CHEMICAL SLUDGE IN WASTEWATER TREATMENT[R]	TWM03
18.	SECURE LANDFILL (SLF)[C]	TWM04
19.	PREPARATION OF COMPOST FROM ANIMAL HAIR WASTE (PROCESS BASED TECHNOLOGY)[C]	TWM05
20.	CO-DIGESTION OF TANNERY SOLID WASTE FOR BIOGAS GENERATION[C]	TWM06
	CATEGORY IV - LEATHER PRODUCT TECHNOLOGIES	
21.	SMART LEATHERS RESPONSIVE TO ELECTRICAL AND MAGNETIC FIELDS[R]	LPT01
22.	SIZING SYSTEM FOR CHILDREN SHOES[H]	LPT02
23.	DIABETIC FOOTWEAR[C]	LPT03
	CATEGORY V - HEALTH CARE PRODUCTS	
24.	HIGH VALUE PRODUCTS FROM TRIMMING WASTE (HVP-T)[C]	HCP01
25.	COLLAGEN SHEET(WOUND CARE)[C]	HCP02
26.	AMIPROJIL-PASTE/POWDER[H]	HCP03

[C] represents already commercialised, [R] represents ready for commercialisation

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CONTACT@CSCB. ORG. BR, : https://cicb. org. br/cscb/en

support@zdhc. org https://www. roadmaptozero. com/?locale=en

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28. Figure -28 A. CLRI – Technology - Leather Processing, Leather Chemicals, Enzymatic Products, Environmental Technology, Health care products ppbd@clri. res. in clriinfo@clri. res. in

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Leather Auxiliaries – A Review PART – III

Leather Auxiliaries – A Review PART – I, II & III	
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Green Technologies for the Leather Production – Clariant, Product Range - KEMIA TAU, Italy, Smit & Zoon – Leather Solutions,	**Benefits of Standards, Certifications of Manufacturers of Leather Auxiliaries, TFL, Colourtex, Quimser, Stahl, Archroma, Trumpler, DyStar,**

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Leather Panel- Links, leatherpanel.org References.	CLRI – Technology - Leather Processing, Leather Chemicals, Enzymatic Products, Environmental Technology, Health care products, References.

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Part- III
Responsible chemistry and Life Cycle Assessment (LCA), Vision, Twelve Principles, The 9 LCA impact categories explained,
Cleaner production, CLEANER TECHNOLOGIES, Green Chemistry, The 10 Green Chemistry Principles Applied,
Responsible Care, Sustainable Chemistry, ESG, ESG Landscape - Environment, social & governance report-2019, Stahl Group, Dystar's New Materiality Matrix, Economic, Social, Environment and Governance – Dystar,
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Services – DyStar, The ZDHC Programme, ZDHC V2.0 MRSL, From RSL to MRSL, Input Stream Management,
Chemical Management System, ZDHC- What does ZDHC's Manufacturing Restricted Substances List (MRSL) mean for leather makers
The ZDHC Toolbox, Zero Discharge of Hazardous Chemicals (ZDHC) Certification and Testing Programs, Worldwide Responsible Accredited Production (WRAP), Going Forward, References

1. Responsible chemistry and Life Cycle Assessment (LCA)[1]

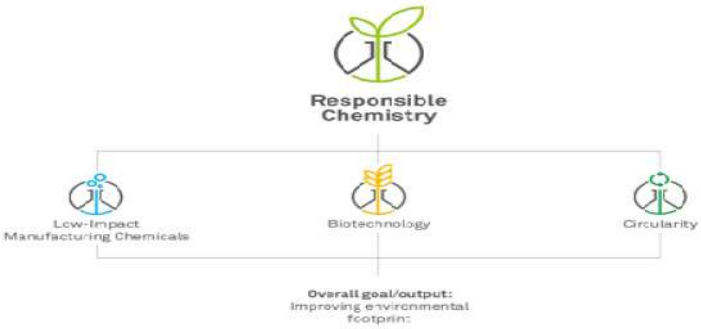
Focus is on three priorities to improve the environmental footprint of Leather Auxiliary Manufacturers and customers:

- Using low-impact manufacturing chemicals
- Using biotechnology to replace non-renewable resources
- Using waste and recycled content contributing to circularity

1.1 Vision on Responsible Chemistry - Stahl Table – 1 A

From a sustainability viewpoint, it is equally important to look at what happens when the products we help to make reach the end of their respective roads. We actively try to replace petrochemicals with renewable resources.

1.2 Responsible Chemistry Figure – 1B



Using the Life Cycle Assessment methodology, we measure the impact of a product on the environment over the course of its life.

1.3 Twelve Principles of Responsible Chemistry - Stahl [1]

Green Chemistry Principles	Explanation Table – 1C
Resource efficiency	We take care of the resources we use. Where possible, we avoid using limited, finite feedstock. Renewable/CO2/Waste2Chemicals and recycled feedstock
Atom efficiency	We focus on creating chemical solutions with a high atom efficiency.
Decarbonization of energy	We support energy decarbonization by using energy efficient operations and renewable energy where possible.
Water management	We focus on responsible water usage and effluent outflow by us and our customers, so reducing the global pressure on water demand.

Green Chemistry Principles	Explanation Table – 1C
Waste management	We understand the economic, social and environmental benefits of reducing waste, and the possibilities to assign value to waste as a resource for energy and new materials.
Best available technology	We strive to use the best available technology in respect to sustainability/circularity.
Support innovation	We love innovation because we love to change and make our world better, step by step. We are flexible and open minded.
Share knowledge (educate) and work together	We are a knowledge-based company. We work together, share knowledge and celebrate our successes.
Safety, health and the environment	Our chemical solutions and processes ensure that the risks of exposure to hazardous and non-hazardous chemicals and emissions are kept to a minimum for our employees, customers and the environment
Matching chemistry	We focus on understanding the whole value chain of our products – including recycling, composting – and so matching usage with end-of-life.
Product stewardship	We promote services over the full life cycle of a product rather than products alone, drive chemical leasing, and promote efficiency over production rate.
Measure and assess	We make smart decisions by using standardized methodologies to measure the impact of our products and processes on health, safety and the environment (LCA, ISO, ASTM 6866, EPD, VDA, etc.).

1.4 What is Life Cycle Assessment (LCA)? [1]

LCA is a methodology that measures the impact of any product on the environment over the course of its life. The LCA methodology can provide quantitative data in a format that permits comparisons to be made.LCA will be an important value-added service for our customers in the supply chain in the future.

1.5 The 9 LCA impact categories explained

LCA Indicators Figure – 1 D

1.6 LCA defines nine impact categories

LCA defines nine impact categories Table - 1E
• Climate change: Climate change occurs when new lasting weather patterns emerge as a result of changes in the earth's climate system. Global warming is a critical factor within this impact categories. • Abiotic depletion: Abiotic depletion is the use of non-renewable material resources like earth minerals, metal ores and fossil fuels, beyond their rate of replacement. • Land use: Land use is a pervasive driver of global environmental change. It

LCA defines nine impact categories Table - 1E
includes all human activities and arrangements that harnesses terrestrial ecosystem services.
• Water consumption: Water consumption is an important indicator for the environmental footprint of products and services. • Eutrophication: Eutrophication refers to the potential of water to become overly enriched with minerals and nutrients which can lead to the excessive growth of algae (algal bloom) and reduced or insufficient oxygen (hypoxia). This ultimately can lead to a decrease in biodiversity. • Acidification: An increase in the concentration of acidic elements can lead to a change in the natural chemical balance. This is called acidification. The major cause for acidification is the deposition of sulfur, nitrogen oxides and ammonia in the air. Acidification can lead to a decrease in biodiversity, damages to forests, corrosion and human health issues.
• Toxicity: Toxicity refers to the ability of a substance to produce an unwanted effect when it has reached a sufficient concentration within the body. If a product has a higher toxicity, a smaller concentration is necessary to cause harmful effects. • Photochemical ozone formation: The formation of ozone at the ground level of the troposphere. This is caused by photochemical oxidation of Volatile Organic Compounds (VOCs) and sunlight. High concentrations can damage vegetation, human respiratory tracts and manmade materials through reaction with organic materials. • Ozone depletion: The release of chemical compounds containing gaseous chlorin or bromine gradually thins the earth's ozone layer in the upper atmosphere.

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Reference : Table - 1 A. Chemicals for Sustainable Leather Manufacture 53rd LERIG Prasanna Maduri, Campus Manager, 29 January 2020

The approval of the Leather Product Category Rules (known as PCR or PEFCR) by the Environmental Footprint Committee of the EU is a major milestone for the leather industry.

It defines how LCA can be used to calculate the impact of leather manufacturing on the environment. It includes all aspects of leather manufacturing in tanneries; input data on hides, chemicals, water, energy, plus output data of water, air and waste.

2. Cleaner production [2]

The terms Cleaner Production, Pollution Prevention and Responsible Care are often used interchangeably.

Cleaner production Table – 2 A
Cleaner Production stands for a proactive and preventive approach to industrial environmental management and aims for process- and/or product-integrated solutions that are both environmentally and economically efficient ('eco-efficiency'). Cleaner Production (CP) and Pollution Prevention (P2) focus on a strategy of continuously reducing pollution and environmental impact through source reduction -- that is eliminating waste within the process rather than at the end-of pipe. Waste treatment does not fall under the definition of CP or P2 because it does not prevent the creation of waste. Cleaner production (CP) is a general term used to describe a preventative approach to industrial activity It encompasses: waste minimization, waste avoidance, and pollution prevention.

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(To be Contd.)

High Quality Syntans for Fulfilling All Your Needs

Our Products
Lunatan PS2
Lunatan PTS
Lunatan S
Lunatan CX
Lunatan ART Liquid
Lunatan NSP

Our Pretanning and Tanning Syntans are free of BISPHENOL A, BISPHENOL F, BISPHENOL S, BISPHENOL AF, BISPHENOL B

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