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9th Edition
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The 15th edition of Meet at Agra, the Leather Footwear Components & Technology Fair, organised by the Agra Foowear Manufacturers & Exporters Chamber (AFMEC) will be held at the Agra Trade Centre, Singhna Village, NH-2 Agra from 27 to 29 October, 2023.

The fair venue Agra Trade Center is located about 20 km from Sanjay Place. Bus will be provided to ferry exhibitors from Fatehabat Road, Sanjay Place Hotels and other hotels along the route. Travelling time is about 30 to 40 minutes.

Around 200 companies from overseas and across the country will be presenting the finest leather, a wide variety of latest footwear components / accessories, adhesives and shoe finishers and state of the Art Machinery / Technology the organizers have planned to organize technical sessions / panel discussions on 20th Oct.

Agra, the city of Taj is the biggest Footwear Manufacturing Hub of India and caters for 60% of the total domestic requirements. It has a 30% share in total exports of leather footwear from the country. Most of the world's top brands are sourced from Agra. Hence Agra offers tremendous business opportunity to the exhibiters of "Meet at Agra".

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All China Leather Exhibition 2023 – A good beginning

The All China Leather Exhibition (ACLE), popularly known as Shanghai Leather Fair organized after a hiatus of four years closed with positive results. This mega event served as a positive force in promoting trade and imports for the Chinese leather industry during the period of economic recovery. The participation at this edition exceeded all expectations with over 1000 exhibitors from across the globe welcoming more than 28,000 visitors from the trade and the industry. This premier leather event provided a good meeting place for international participants seeking business contacts in China's huge market. ACLE stands as a beacon of industry resilience and international participation.

This year's ACLE has really generated more expectations from the global leather industry, as this event is set to be the barometer of the leather industry. ACLE is considered as the ideal platform to bridge international suppliers with around 23 thousand Chinese buyers of whom 19 thousand come from the main manufacturing provinces of the country. As the global economy is gradually recovering strength after the impact of pandemic effect, the outcome of ACLE, we hope, will reveal a new prosperous beginning for the leather sector.

Back home, the value of India's exports Leather, Leather products and shoes for the period April - June 2023 - 2024 stands at US$ 1200.93 million as against the value of US$ 1388.56 million recorded during the period April-June 2022 2023,showing a decline of -13.5%. According to Shri Sanjay Leekha, Chairman, Council for Leather Exports, the persisting global market slowdown is a cause of concern, but he is optimistic that country's exports would return to the growth trajectory soon. He said, going by the current trends, exports from the sector during 2023-2024 are expected to be in the range of US$ 5.4 to US$ 5.6 billion as against the export performance of US$ 5.2 billion during 2022 – 2023. He said USA is now the largest importing country for footwear and leather sector. Removal of US GSP for leather products has affected our exports to the tune of US$ 450 million per annum. As the US Congress is now reviewing the reinstatement of the US GSP programe (which expired in December 2020). The CLE has taken up the issue with Government for re-instatement of US GSP for India.

DPIIT gives Maharashtra go-ahead for mega leather footwear and accessories park

- Maharashtra is currently the 8th largest producer and exporter of leather goods in the country.

- Maharashtra industrial development corporation has submitted a proposal to develop the project. The Govt. of India will provide financial grants up to Rs.125 crores for the project.

The Department for Promotion of Industry and Internal Trade has given the state of Maharashtra an in-principal approval to launch a Mega Leather Footwear and Accessories Cluster Park. The development will be located in Ratwad, Raigad district and will be designed to boost its leather industry.

DPIIT aims to boost India's leather footwear and accessories exports through industry initiatives.

DPIIT aims to develop the leather goods industry in India to boost employment opportunities, especially for women and young people. By choosing Maharashtra for its next major development project, DPIIT has confidence that the state can take a leading position in leather goods exports, ET Bureau reported.

“Leather sector holds immense potential for empowering women and engaging the youth,” read a release by DPIIT, TNN reported. “The establishment of the Mega Leather Footwear and Accessories Cluster Park in Raigad will mark a milestone in Maharashtra’s economic growth trajectory. This ambitious project will unleash a tremendous employment opportunity, strengthen the leather sector ecosystem, and foster the state’s overall economic prosperity.”

The Mega Leather Footwear and Accessories Cluster Park will be setup over 151 acres and will be designed to encourage collaboration across the industry. The facility aims to bring together leather manufacturers, designers, suppliers, and artisans and give them access to modern technology.

“The establishment of the Mega Leather Footwear and Accessories Cluster Park in proximity to Mumbai will provide a major boost to the sustainable leather industry in the state,” announced DPIIT. “This initiative reflects Maharashtra’s commitment to fostering economic growth, driving employment opportunities, and propelling the leather sector to new heights.”

Solidaridad

Solidaridad supporting

'Women Entrepreneurs in Leather Industry'

to create *Wealth out of Waste.*

The woman entrepreneur and team who has been trained and capacitated on making sustainable value-added products from solid waste of the tanned leathers with the support of Solidaridad has participated in the event of "Aadi Thiruvizha" (Exhibition cum sale of products made by Women Entrepreneurs) in Chennai on August 11, 2023 for supporting the women empowerment, which has been organized by the CSR team of Equitas bank.

The European Union (EU) - Switch Asia funded Tamil Nadu project team in Solidaridad has facilitated in creating the market linkages for the participation and also assessed the market demand for the sustainable value-added lifestyle products from leather waste. The value-added products from leather waste which were completely manufactured by women artisans supported by the EU project were displayed.

There was a good footfall of more than 350 visitors at the stall and were highly appreciative of the leather goods produced by the woman artisans. The event helped in promoting the concept of creating wealth from leather waste, sustainability, green marketing strategies and the necessity to move towards circular economy, also increasing the visibility of the project.

The entrepreneur sold a good amount of leather goods and has got new orders at the event, aiding in creating more green jobs, especially for women workers, eventually improving the livelihood. She was very much delighted for the opportunity created by Solidaridad to be part of the event and for establishing the connections with potential buyers, retailers, and distributors for ensuring a sustainable market for value-added products from the leather waste.

Please visit our website:

www.indianleathermagazine.com

73rd Foundation Day Celebrations & Prof B M Das Memorial Lecture

The Indian Leather Technologists' Association (ILTA), Kolkata, celebrated its 73rd Foundation Day and also held Prof B M Das Memorial Lecture on 14 August, 2023 at the Seminar Hall, Science City in Kolkata.

Shri Arnab Jha, President, ILTA delivered the welcome address. Senior members of ILTA, Representatives of GCELT, Alumni members of GCELT, Representatives from CFTC and award winners, paid floral tributes to the portrait of Prof B M Das. This was followed by presentation of Prof B M Das Memorial Medals and Certificates to the toppers of B.Tech and M Tech examinations held in Moulana Abul Kalam Azad University of Technology, West Bengal and Anna University in Chennai.

Shri Arjun Verma received the J Sinha Roy Memorial Award for his article, titled **"Design & Development of Low-Cost LDR Shoes"** published in August 2022 issue of JILTA, adjudged the Best of all articles published in JILTA in the calendar year 2022.

Prof Subhamoy Moitra, Professor at the Applied Statistics Unit, Indian Statistical Institute, Kolkata, delivered the Prof B M Das Memorial Lecture, titled, **"Application of Computation Methods in the MSME Sectors related in Leather Industry".** The award winners, Ms Sarika Kumari, Mr H Manikandan, Mr T Venkatachalam and Ms Kritika Vagmi were invited to deliver few short speeches on their projects and achievements. Shri Supriyo Sinha, Executive Director, Peerless Group gave an interesting and informative speech on the subject **"Entrepreneurship and How Digital can help in Labour Productivity"**

There were around 200 participants at the event. Finally Shri Susanta Mallick, General Secretary, ILTA, proposed the vote of thanks. Many cultural events were organised in the evening which was followed by a gala dinner.

ACLE 2023 CAME TO A SUCCESSFUL CLOSE

RECOVERY OF THE LEATHER INDUSTRY SENDS POSITIVE SIGNALS

- **More than 1,000 exhibitors from 29 countries and regions**
- **Recorded attendance of 28,000 professional visitors**

After a four-year hiatus, the 2023 All China Leather Exhibition (ACLE) was held in an optimistic atmosphere at the Shanghai New International Expo Centre in Halls E1-E7 on August 29-31, 2023. The exhibition covered an area of 80,500 square meters with more than 1,000 exhibitors from 29 countries and regions, including 14 international and domestic pavilions. The pavilions represented came from Australia, Brazil, France, Italy, the United States, Thailand, Pakistan, China Taiwan, as well as Guanghua County, Pingyu County, Ou Hai County, Wuji County, and Xinji City of China.

This year's 23rd edition of ACLE attracted more than 28,000 professional visitors, such as traders of raw hides and skins, as well as footwear, luggage, clothing, furniture, and automotive interior manufacturers and designers. Buyers attending included retailers from related industries, and the total number of visitors was an all-time record for the event and 20% more than the last pre-pandemic edition in 2019.

The three-day trade fair was complemented by a series of onsite events of topical, commercial and educational interest. These included conferences and seminars featuring topics such as the 2024 Spring/Summer Leather Trends, the International Tanning Industry Executive Summit, and the Changing Landscape of the Leather Industry. Other innovative subjects covered were the New Product and New Technology Launching Event, OEKO-TEX Leather You can Trust, and the 2024 S/S Leather Industry Insights, gathering experts from home and abroad to discuss sustainability, new technologies, innovations, and industry trends.

As China's premier leather trading platform, ACLE 2023 brought together industry leaders, innovators, and enthusiasts around the world, to showcase the latest breakthroughs in the leather industry, and provided new opportunities for expanding networks, sharing industry knowledge, and promoting business growth. In the post-pandemic era characterised by a weak consumption, the Chinese leather industry is suffering setbacks caused by an oversupply of raw hides and changing consumer awareness. Nevertheless, opportunities and challenges always coexist. ACLE 2023 has shown the flexibility and innovation of the leather companies and, on that basis, provided a refreshing direction for the industry.

Ms. Jane Li, Vice President of the Leather and Hide Council of America (LHCA) said that last year, the proportion of wet blue leather exported from the US to China had slightly decreased but is expected to soon return to normal as the economy recovers. Mr. Gabriel Doria of Gobba Leather from Brazil was very happy to re-establish contact with the Chinese market after four years and that more Chinese customers are showing interest in Brazilian leather. The representatives from Fenice and Tannerie Arnal Sas also stated that despite the global economic downturn, the Chinese market remains

vibrant since the rise of China's auto manufacturing led to more demand for quality leather.

As consumption habits and concepts change, some of the functionality, practicality, and aesthetics of leather have now become necessities. As the first ACLE after the pandemic, the event went beyond the expectations of the exhibitors. China has a buoyant market as the largest raw hides importer and leather product processor. Although impacted by international situations and visa restrictions, the number of overseas buyers has slightly decreased, while domestic buyers are more active. All these signs point to positive signals and trends for the future development of China's leather industry.

After four years, thousands of, buyers gathered once again at the All China Leather Exhibition, with those from Zhejiang, Guangdong and Shanghai in evidence. New and old friends joined the grand event and for leather product purchasing merchants who are almost a fixture of the exhibition, there were big gains in establishing contacts with old and new suppliers. For industry newcomers who came for the first time, it was an excellent learning opportunity, and future visits to the ACLE will also be added to the annual schedule. Overseas buyers were moved by the lively atmosphere and the crowd in the exhibition halls. Four years on, ACLE provided refreshing surprises and has proved itself to be a vital catalyst in the reinvigoration of China's leather industry.

Looking ahead, the 2024 ACLE will be held at the Shanghai New International Expo Centre on September 3-5, 2024. See you next year!

Source www.aclechina.com

Brazilian Leather at the All China Leather Exhibition (ACLE)

It was a great comeback. One of the most important world fairs in the leather sector, the All China Leather Exhibition (ACLE), in Shanghai, had been held for the last time in 2019 and its 2023 edition brought huge expectations. With the massive participation of the Chinese buyer market in the three days of the event – between August 29th and 31st – the return of ACLE brings good prospects for the more than 1 thousand exhibiting companies.

The Brazilian leather sector was represented at ACLE with 13 individual stands, with the support of the Brazilian Leather project, an initiative to encourage exports carried out in partnership by the Centre for the Brazilian Tanning Industry (CICB) and the Brazilian Trade and Investment Promotion Agency (ApexBrasil).

Brazilian exhibitors at the ACLE expressed satisfaction over their participation. To mention a few: “This edition of ACLE, in person in Shanghai, after four years, brings encouragement to the sector. Being able to meet traditional customers and meet new people is important. There was a demand from the audience for this proximity, converging to this moment in which we have a tendency to organize the market.” Guilherme Motta, CEO of JBS Couros.

“It was a very positive fair from the very first day on, with visits from our main customers. ACLE 2023 had a professional, direct audience, dealing with business. There were four years of absence and, as a result, the market had a great desire for an in person reunion.” Volnei Roberto Durli, president at Durlicouros.

“In a market that is becoming increasingly concentrated, we can see the importance of fairs. ACLE 2023 was very busy.” Nikolas Fuga, director at Fuga Couros.

“It was a very well visited fair. All important traditional clients were here, with key professionals representing each company.” Rafael Mariño, commercial director Coming.

“With the return of ACLE, we had the opportunity to meet customers in person, which is very important for the leather industry.” Gabriel Doria, Gobba Leather trade manager.

Global Footwear Industry News

Brazilian Footwear exports fell 6.6% through August

Data prepared by the Brazilian Footwear Industries Association (Abicalçados) indicates that, between January and August, shoe exports totaled 82.28 million pairs, which generated US$ 823.15 million, drops of 15.7% in volume and 6.6% in revenue related to the same period last year. Considering only the month of August, exports were 9.34 million pairs and US$ 95.6 million, drops of 12.8% and 18.6% compared to the same month of 2022. Before the pre-pandemic, between January and August 2019, the sector still registers positive indices, of 9.2% in volume and 26.7% in revenue.

The CEO of Abicalçados, Haroldo Ferreira, points out that the slowdown in the international economy, coupled with high interest rates and cooling demand in important countries for Brazilian footwear, such as the United States, has a direct impact on the indices. “We expect some improvement in the last months of the year, but even so we should close 2023 with indices between 6.7% and 9.1% lower than those registered in 2022 (in pairs)”, projects the leader, stressing that, even with the result, the indices will be above those registered in the pre-pandemic, in 2019.

Mexico will end 2023 with a rebound in production - Head of the CICEG

Mauricio Battaglia Vázquez estimated that, after the great fall due to the pandemic and the appreciation of the peso, the sector is in recovery and will close 2023 with a 30% growth in its GDP. According to the president of the Guanajuato Footwear Industry Chamber, CICEG, the health crisis resulting from the Covid-19 pandemic caused a reduction in the sector's GDP of around that figure, so the sector will be approaching its previous level.

“We have been recovering constantly, so at the end of this year it is expected to be less than 5% compared to 2019,” Battaglia reported.

Despite this positive data, the sector has expressed concern about the growth in footwear imports, especially from China. According to data provided by CICEG, during the first half of this year, imports increased by 14.43% and describes China, India, Vietnam and Indonesia as “the great monster of shoe manufacturing worldwide” due to low prices. of their products.

The Chamber also referred to another “threat” that the Guanajuato footwear industry has to face, among which it mentioned electronic commerce, pointing out that it is very poorly regulated and they pay very low taxes, and oligopolies are the ones who set market prices. .

Source: Herald of Mexico / CueroAmérica

Argentina's footwear production rose 14.5% in July and maintained growth

The production of footwear and parts in Argentina grew year-on-year during the month of July, according to the most recent Industrial Manufacturing Production Index prepared by Indec and published by the Chamber of the Footwear Industry (CIC).

On the other hand, in the accumulated period between January and July 2023, the production of footwear and parts also showed growth, but in this case it was 3%. At a general level, manufacturing production in the country contracted in the seventh month of the year by 3.9% year-on-year, but showed a growth of 0.5% in the accumulated of the first seven months of the year.

For its part, retail sales within the footwear and leather goods sector reached a small growth of 0.8% year-on-year in August, according to the latest report from the Argentine Chamber of Medium Enterprises (CAME) and remain stable in the accumulated of the year compared to the same months of 2022.

“There were few deliveries of merchandise by suppliers and businesses went out to liquidate products early to gain liquidity. "This allowed the item to end with a slight annual increase." From the CAME they highlighted that the sale was oriented almost exclusively to Argentine products due to the drop in the entry of imported footwear. Source: CIC / CAME / CueroAmérica

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Bangladeshi leather exports decline

From July to August, Bangladesh posted a 12.73% decline in leather exports, as compared to the same period of last fiscal year. Only the leather goods segment grew in the period.

According to the Export Promotion Bureau of the Government of Bangladesh, in the first two months of fiscal 2023-2024, total leather exports amounted to 194.8 million US dollars, which represents a decline of 12.73%, on a comparable basis to the same period of the previous year. The figure recorded was also down by 4.32% from the strategic target set for the period of 203.6 million US dollars.

By segment. Between July and August, leather footwear exports generated 112.1 million US dollars, declining by 23.52%, as compared to the same period of fiscal 2022-2023; they also missed the strategic target set for the period by 0.66%. In addition, finished leather exports totalled 20.3 million US dollars, down by 12.57% from a similar period

of last fiscal year and by 0.25% from the strategic target set for these two months.

As for leather goods exports. In the first two months of the current fiscal year, exports in this segment reached 62.5 million US dollars, up by 16.79%, on a comparable basis to a similar period of the prior year, but were down by 11.33% from the strategic target set for the period of 70.4 million US dollars.

The data also shows that other footwear exports increased by 6.52% to 79.9 million US dollars but fell short of the strategic target set for the period by 3.7%.

Bangladeshi Footwear Industry

The World Footwear 2023 Yearbook (more information available HERE) shows that the country is now one of the top 10 producers of footwear globally. Over the past decades, its exports, mainly to the US and European markets, have experienced rapid growth with another 20% increase recorded in 2022. (worldfootwear)

Today's leather tanneries not only have to deliver high-quality durable products – they must also deliver them with minimal environmental impact and without compromising on the health and safety of people. At Stahl, we see this as an opportunity to support our customers and the wider leather industry in driving responsible products and sustainable living. In close cooperation with our partners, we recently launched Stahl Ympact®, a family of leather chemical solutions made with renewable feedstocks. Stahl Ympact® will help tanneries to reduce their environmental footprint without compromising on the quality and performance of their products since these ZDHC-compliant solutions deliver the same or improved function performance to conventional alternatives.

After the introduction of 7 product solutions of renewable carbon polyurethanes for base- and topcoats in leather finishing, we've now also introduced 15 specific solutions of renewable carbon wet-end products for leather processing.

If you would like more information about Stahl Ympact® or how we can support you to embrace the opportunities of an evolving leather industry, visit **stahl.com** or get in touch with us at **communications@stahl.com.**

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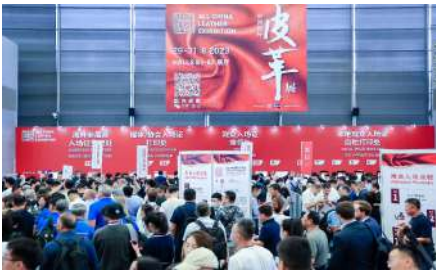


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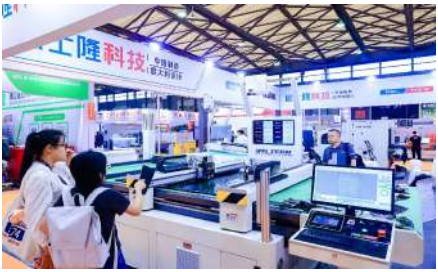

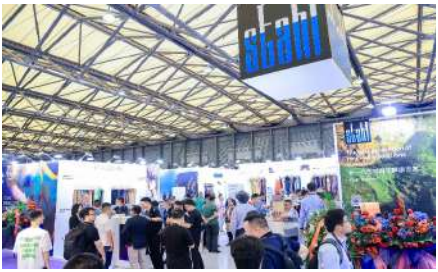

Source : www.aclechina.com

Mohamed Sadiq receives "Lifetime Achievement Award"

- **ISF & IFLMEA jointly bestowed the Honour on the CSIR-CLRI Scientist for service par excellence.**

At the 31st Annual General Body Meeting of the Indian Shoe Federation (ISF) and the 40th Annual General Body Meeting of Indian Finished Leather manufacturers Association (IFLMEA) held on 8th September 2023 at Hotel TAJ Coromandel, Chennai; both ISF and IFLMEA jointly presented a "Lifetime Achievement Award" to Mr Mohamed Sadiq of CSIR-CLRI Design and Fashion Studio.

In picture: (Mr Habib Hussain, Past-President ISF is reading the Award contents in the august presence of Dr M Rafeeque Ahmed, Chairman, FARIDA Group; Shri R Selvam, IAS, Executive Director, Council for Leather Exports; Mr PR Aqeel Ahmed, President, ISF; Mr KR Vijayan, Chairman, IFLMEA and Mr Atiqur Rahman, IFLMEA

"Lifetime Achievement Award" for service par excellence to the Leather Industry presented to Mohamed Sadiq, CSIR-CLRI Design & Fashion Studio in recognition of and for his

contributions to the Leather Sector with particular reference to his work in CSIR-CLRI on Footwear Styling and Design; R & D in Trend Forecasting, Colours and Texture Development, Shoe Design Education and Training. He has also excelled in Planning for the Indian Leather sector in the area of design, trends and global competitiveness. His signature contribution has been in enabling the 'Travel of India in fashion forecasting for LEATHER' - an R&D initiative for garnering global leadership. Signed by Mr Habib Hussain in his capacity as President, ISF and Mr KR Vijayan in his capacity as Chairman, IFLMEA.

The Award was handed over to Mohamed Sadiq by Dr M Rafeeque Ahmed, Chairman, FARIDA Group.

CITATION

"Lifetime Achievement Award"

for service par excellence to the Leather Industry

The achievements of Mr Mohamed Sadiq and the leadership through the 38 years (June 1986 to date) & beyond have inspired the Members of the Indian Leather& Leather Products Industry to excel in the areas of trends, colours, fashion and forecasts. He has always been alive to the dynamic needs of the industry and expeditious in his actions to ensure the growth of the sector.

It is indeed heartening to note that Mohamed Sadiq found strong support not only from the leather sector as a whole but also from the apex leather institutions and associations who are galvanising the leather sector to greater heights. Md Sadiq brought about synergy amongst Government, Trade, Institutions, Associations and the International Leather/ Leather Products associations to the discerning and this is indeed laudable!

At all times, Mohamed Sadiq is constantly matching, diluting, digressing, trespassing boundaries, inventing, experimenting and feeling to come up with a winning formula for a successful and growth-oriented Indian Leather Industry resulting in a flow of technology led innovation that is born out of a new wave of optimism.

The Industry has taken rapid strides and Md Sadiq, through CSIR-CLRI has provided the leadership for successful implementation of programmes that have helped to secure the pace of balanced growth, changes in fashion, quality and trends in the international market.

In the world scenario, India ranks among the leading Finished Leather and Leather Product producers. New Development has always contributed in building an enviable technically sound work-force and CSIR-CLRI and Team Design and Fashion Studio is proud to have played a pivotal role.

Mohamed Sadiq has acquired respect and admiration in the leather sector, both national and international through his service and the Industry together: Indian Finished Leather manufacturers and Exporters Association (IFLMEA) and the Indian Shoe Federation (ISF) wish to express their sincere appreciation for his valuable contributions with a Lifetime Achievement Award for helping the industry stay ahead of competition by bringing in 'ideas ahead of time'.

In picture: Mohamed Sadiq of CSIR-CLRI Design and Fashion Studio stands in gratitude to the Members of ISF & IFLMEA who lauded the presentation of 'Lifetime Achievement Award.'

In his acceptance speech, Mr Md Sadiq, spoke on the lessons he had learnt in his life time. He said we need to change with the changing times and constantly upgrade and modernize. He

emphasized on seizing opportunity at the right time and converting it to a lasting success. He concluded his address saying "Life has been full of experiences" but, there were also the joys and opportunities".

In picture: Team CSIR-CLRI Design & Fashion Studio (L to R): Mr R Sathiyaraj, Dr D Suresh Kumar, Mr P Vinoth Kumar and Mr K Dayalan joined Mohamed Sadiq on the dais and expressed their gratitude to the Members of ISF & IFLMEA.

Mr. Mohamed Sadiq profoundly thanked one and all including his parents, family members, teachers, mentors, the Directors of CSIR-CLRI under whom he had worked and especially the present Director Dr. K.J. Sreeram, and the members of the leather fraternity.

Indian Leather congratulates Mr. Mohamed Sadiq on receiving this great honour.

Small skin manufacture for footwear leathers

Part 2 of 2: Wool-bearing sheep skins

Richard P. Daniels, Greentech, UK

This is the second of a two-part series concerning small skin manufacture. It is not a detailed technical study, but a broad summary of a valuable sector of leather manufacture.

Part 1: *Concerns the manufacture of hair-sheep and goat skins for shoe upper leathers. The series starts with the logistics of this sector - differences in structure, preservation, supply and gradings and collection. Hair-burn and hair-save choices are presented, the various pickling options, then manufacture to the finished state.*

Part 2: *Presents the conversion of wool-bearing sheep skins into mainly footwear leathers. It considers the logistics of manufacture that combine aspects of both leather and wool processing.*

The focus is double-face (or two-face) manufacture, but also draws attention to shearling manufacture and the creation of rugs. The overview carries a general review of the needs of both hair-sheep/goat and wool-bearing sheep manufacture too, and how they differ from processing bovine hides.

Synopsis: Wool-bearing sheep skins

The following study concerns the manufacture of wool-bearing sheep skins into double-face (two face) leathers for use in footwear. It also gives reference to the manufacture of shearlings for some types of clothing and industrial uses, and rugs as sub-divisions of this technology.

Wool-bearing sheep are an important part of livestock management that extend into temperate and colder climates. They are an important source of food but in particular are husbanded for their wool as a high value natural product.

In woolskin manufacture, there is a particularly high natural grease content to address, a high focus on wool management, and a need for techniques other than liming (and deliming) for softening as high alkali treatments are detrimental to wool quality. The focus is on the quality and appearance of the wool - often quite different to the objectives of grain leather manufacture.

The manufacture of two-face or double face leathers is central to this study. However, the manufacture of shearlings is a major industry, and is often performed in the same tannery as double-face. This manufacture is not as complex as double face and the skins are usually of lesser value. These variations are made clear within this study. Rug manufacture is loosely based on these procedures, but with considerable variations according to full-scale or cottage-scale manufacture.

1.0 WOOL-SKINS: A HYBRID TECHNOLOGY

Wool skin processing is a specialised area of small skin manufacture where the focus is on the quality and appearance of the wool as opposed to the grain structure. There are significant differences when compared to bovine leather technologies, but many practicalities and logistics are close to hair-sheep and goat skins manufacture, where the plant and equipment is dedicated to handing small skins. It is strongly recommended that Part 1 *(Hair sheep and goat skins for shoe upper leathers)* be studied for a general background to issues concerning these matters.

However, the prime objective is to achieve the maximum value from the wool, and this requires quite different techniques than found in general leather manufacture. In reality, manufacture is a hybrid of wool and leather making technologies.

With close focus on wool quality, a clean, compact and consistent flesh substrate is essential for either a high-quality sueded surface, or for the support of a light finish. This is quite different when compared to leathers with a focus on the grain surface.

1.1. Structural differences:

Wool-bearing sheep are bred for wool and meat production, and the fleeces are considerably greater in weight and volume than the shorter coarse hair found on hair sheep and goat. Accordingly, the skin structure is different too. It is thick, but relatively delicate, and may have a fat content of around 20% on the raw skin weight. This influences the way that these leathers are made, as the skins are weaker and can be more easily torn in processing. There are more voids too within the fibre structure, especially after the removal of fat.

Fig 1: Typical wool-bearing sheep from temperate climate.

Fig 2: Mixed flock of hair-sheep and goat in Eritrea.

Fig 3: Shows the more open structure wool-bearing sheepskin with delamination.

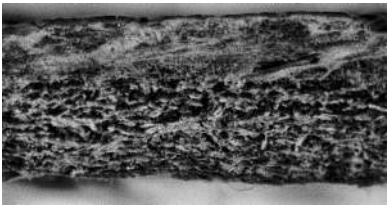

Fig 4: Shows a dense and compact structure of a hair-sheep skin.

Over and above the importance of the skin structure, the predominant factor is the considerable quantity of wool when leather processing compared to the skin weight. This wool is of high value, and can easily become matted or felted.

1.2. Skin supply, collection and preservation

Wool sheep originate mainly from large scale enterprise, with more centralised slaughter and preservation than hair sheep and goat. Slaughter is not influenced by tradition to the same degree as hair sheep and goat, nevertheless, there are times of surplus and shortage, and this affects availability and supply. The methods of preservation are mostly wet salting or dry salting, with global sales and movement. There are frequently long storage times before manufacture.

1.3. Technical issues:

In manufacture, it is important to minimise the stress on the skins and to reduce the problems of felting. To meet these needs, it is essential to use very high floats when compared to other types of leather manufacture. These floats are typically around 500% as opposed to 50 – 150% for most other leather types.

The unhairing process is omitted too, with an absence of any high alkali treatment to avoid coarsening of the wool texture. As a consequence, there is no alkali swelling of the skin, or solubilisation of unstructured proteins as achieved in liming. For this reason, alternative techniques are needed to soften and extend the collagen structure. In addition, the release of natural fats is hindered as the fat cells remain more intact, and degreasing techniques have to be used as the natural fat content can be considerable.

The machinery employed is similar to small skin grain manufacture, but there is a need for specialised equipment to address the wool component. Similarly, paddles and small skin processors operating at high float levels are required in the place of conventional drums.

It is noted that there are strong similarities between the manufacture of double-face, shearlings and rugs in the initial stages, but with variations after pickle and tannage to the final state according the end use. Success is dependent upon the detail of processing, and in particular, care is needed to avoid wool tangling/matting at all stages.

1.4. Value

The major issue is to retain the quality of the wool, and avoid any wool slip. The value of the recovered wool after sheared to a specific length is very significant.

2.0 OVERVIEW: PRODUCING DOUBLE-FACE/TWO-FACE LEATHERS

2.1. Structure

A typical wool-bearing breed of sheep has been bred and reared with focus on the value of the wool, the weight of this wool having a significant effect on the skin structure. This is comparatively weak when compared with other skins of similar size, especially at the junction between the grain layer and the corium. Too much stress in manufacture, or over-opening of the structure can readily cause delamination.

2.2. Raw materials

To off-set fluctuations in annual supply, large raw stocks are commonly held by tanners. The different species and environments produce different wool types and skin size. According, there are considerably differences in wool length, quality and texture according

to location, breed and husbandry. Knowledge of the sources of supply, sorting and grading are key for end-use to specification.

Careful inspections and gradings are needed, with particular attention to an absence of wool slip across the whole skin area. At the time of preparation for soaking, trimming is essential to avoid skin tangling and any resultant wool matting.

2.3. Processing vessels

To avoid wool matting, and to minimise stress on the skin, mechanical action throughout wet chemical processing is minimal, with major reliance on paddle use. These operate at very high float levels when compared to drums, and rely on the gentle action of rotating paddles blades to maintain skins in suspension. Processors of various construction are used too, where different loadings of skins and high floats can be managed safely.

2.4. Soaking and first-time fleshing:

Salted skins are first lightly tumbled, brushed or shaken to remove surplus salt. In the first soak, the objective is to remove dirt from the wool and partially rehydrate the skin structure.

Fig 5: Typical wool-sheep piled after wet salting.

Fig 6: Tumbling dry salted sheep skins to remove surplus salt before trimming and inspection.

This is a paddle-based operation, and the soaking time varies according to the preservation method.

It is noted that the paddles are often designed for rapid removal of the used floats and fast delivery of water. Doors fitted to the paddle ends are designed for easy discharge of skins into containers, or are constructed with tippable interior sections to assist manual handling.

The skins do not need to be fully soaked at this stage, as some firmness is needed to improve the cutting action on first time fleshing. A considerable amount of fat can be removed during this operation.

2.5. Wool washing (scouring) and shearing:

After first-time fleshing, the skins are lightly scoured to remove dirt and grease from the wool. The process uses a blend of wetting agents and sodium carbonate to adjust the pH to mildly alkali conditions, and it may be that enzymes are used within this processing. After unloading, stacking and allowing to drain, spin drying is mainly used to de-water and to avoid any compression of the skin and wool or tearing of the structure. A mechanical combing may be used at this stage free tangles and debris from the wool.

Fig 7: Offer to wool shearing by band-knife after spin dry and mechanical combing.

Fig 8: Shows wool skin part-sheared to length.

The wool is then mechanically sheared to a uniform length, being slightly longer than the final length, as accuracy is only possible when dry. On machine offer, the skin is held firmly to a mesh conveyor belt by vacuum, and within the machine at the time of cutting by a band-knife, the wool is raised and extended by suction.

However, the wool around the skin edge is held flat to the belt by the vacuum during shearing, and therefore remains as a surplus. This is removed to length by hand shearing. With the wool at a uniform length, a very effective second time fleshing is now possible to provide a very clean flesh part and more grease removal.

2.5 Fleshing, pickling, degreasing and tannage:

The heavy mechanical action also extends the skin, as an important part of softening as the normal opening and softening created by liming/unhairing is absent.

A sulfuric/formic/salt pickle is generally used, but other organic acids may replace formic acid. Once complete, the skins are stacked down for several days to drain, to avoid compression of the wool and structure that would result from samming. This laying period allows some acid breakdown *(hydrolysis)* of the collagen structure too. The resultant softening is influenced by temperature, time and choice of organic acid, and part-compensates for the lack of a liming process.

A degreasing process is normally performed after pickle and before tanning, and there are several options according to grease content. For skins with low grease content, a de-acidification to neutral pH, followed by emulsification with wetting agent may suffice.

A more usual technique is to employ a light pre-tan, mainly using a modified form of glutaraldehyde raise the shrinkage temperature. The temperature within the paddle or processor can then be raised

sufficiently to soften/melt the grease, coupled with emulsification by use of wetting agent. This grease removal is enhanced by the extended laying period after pickle.

Fig 9: In the absence of liming, the extension in 2nd- time fleshing is very important in the softening process.

Fig 10: A laying period after an acid/salt pickle creates a further softening of the fibre structure.

Fig 11: The wheeling machine. Extensively used for cleaning the flesh side and extendion for softening.

Fig 12: Wheeling after chrome tannage. The operation is highly dependent upon the skill of the operative.

Tannage is usually based on chrome tannage modified according to the high float levels involved with paddle use, although both wet white and vegetable tannages are possible. Once tanned, the skins are dewatered by stacking an allowing to drain, or by a very light samm/setting. This is followed by a wet wheeling of the flesh side to

abrade flesh residues from the shank and belly parts, and clean the flesh side. It also causes a stretching action, as part of the continuous softening of the structure, being very reliant upon grit size and pressure applied by the operative.

This operation has an important role in making a uniform surface across the flesh part. In the case of two-face production, the focus is to develop a fine and consistent flesh structure to produce the most uniform and level dyeing.

2.6. Retannage and preparations for dyeing:

After retanning and fatliquoring using either paddles or specialised processing vessels, the skins are washed and stacked to drain. It is noted that for the final part of grease removal dry cleaning operations are performed. Accordingly, the choice of fatliquors must favour a retention within the structure throughout this operation.

Fig 13: Setting/extending drained sheepskins in preparation for tension free drying.

Fig 14: Hang drying wool sheepskins for a soft and relaxed leather structure.

After drainage, centrifuging may be used to part dewater the wool and pelt, before being lightly set on the flesh side to extend the skin in preparation for tension free suspension drying.

	
Fig 15: Polished cylinder with combing teeth for combined polishing and combing..action.	***Fig 16: Typical dry cleaning equipment for degreasing operations.***

This normally by using a conventional horizontal pole system, but alternatively, cabinets with the advantage of controlled temperature and RH can be found. After a laying period, the skins are lightly conditioned by water spray in preparation for softening by staking action. There are several different machine configurations for staking, but actions for woolskins are mainly based on cylinder arrangements that on rotation extend and apply a setting action to the flesh parts.

The wool may then be sheared to a more precise length using a band knife in a similar manner to shearing after first time fleshing. This is in preparation for combing, straightening, and ironing.

These three operations may be combined actions on a single machine fitted with a polishing cylinder fitted with combing teeth, or as separate machine actions. These events can include a wool straightening stage that commences with an acid/alcohol spray to soften the wool, followed by extension by hot ironing. The spray may also be incorporated within this ironing action.

The wool may then be re-sheared to create a very precise length.

The degreasing may then be completed by dry cleaning using perchlorethylene to remove residual natural grease. As a broad

generality, around half of the grease can be removed in wet processing and machine operations, but for high removal and prevention of odour in the final article this operation is difficult to avoid. Solvents are recovered at the end of processing for reuse, with the recovered grease either sold or used as boiler fuel.

It is important that the skins are below 12% moisture at this stage as the degreasing is performed at raised temperature, and a low moisture content is essential to avoid shrinkage.

Once the degreasing procedures are complete, the skins are lightly conditioned with water spray before buffing. This is a particularly important operations to develop a clean and uniform nap in preparation for dyeing.

2.7. Wool and leather dyeings

Dyeing is performed in paddles or processors as the high floats are needed to avoid felting, and provide uniform distribution and uptake of dyestuffs. Over and above well open and free-flowing wool sheep skins, the uptake and development of colour is strongly influenced by previous wet chemical operations, good grease removal, and a clean and uniform flash substrate.

Fig 17: Paddle dyeing double face woolskins. Wool and leather technologies combined.

Fig 18: Classic double face (two face) sheared to length and with sueded flesh side.

This can be a very complex procedure where the wool is dyed first, using dyestuffs that favours wool fixation instead of the suede side. The leather is then dyed to shade, but may also be dyed in colour combinations.

These dyeing's are more complex than either wool dyeing or leather dyeing alone. It is also possible to dye the leather with the wool remaining undyed, but throughout these procedures there are always risks of cross-uptake of the dyestuffs, and these events need taking into close account.

Dependent upon the degree of softness required, after draining, the skins may be set, then toggle dried. For the softest result, they may be drained (or centrifuged) then hang or suspension dried. These operations are followed by conditioning, and restaking. The wool may receive a final iron, shear, and re-polish. If the skins have been suspension dried then a light re-toggling to shape may be needed. Many combinations are possible.

This may complete processing for double face - a high quality wool skin, combined with a fine suede leather. However, the suede side may be finished, that can involve sealing the surface then creating a light aniline type finish. It may be that transfers or ultra-fine laminations are used to create effects.

2.9 Shearlings and rugs

Manufacture follows the same basic processing as double face to the pickled and degreasing stage. However, at the time of tannage there may be high additions of stable fatliquor. A clean flesh side is needed, but there is not the high emphasis as required for a fine suede surface. As this class of wool-bearing leathers require a natural appearance, preparations as used for the most pristine dyeing's are not needed. Accordingly, these wool skins are not wet back after drying or subject to further chemical processing. Post drying operations vary according to end use.

The manufacture of sheepskins for rugs follows similar procedures to shearlings, mainly dependent upon wool length. If there are issues with hair slip as determined in initial sorting procedures, the skins may be designated to procedures similar to the conversion of hair sheep and goat skins into grain leathers. In these events, soaking is performed in paddles to avoid wool felting, but then, after wool release by painting and pushing, manufacture can continue within drums or processors at lower float levels.

2.10. Improved use of water and chemicals:

High water use is required throughout processing and within washing operations, and care and attention is needed to maintain the wool in the optimum state. In tannage, retan and fatliquoring these high floats are coupled with chemically inefficiency due to high dilution factors when compared to drum processing in conventional grain leather making.

In tannage, retannage and fatliquoring these high floats are coupled with chemically inefficiency due to high dilution factors when compared to drum processing in conventional grain leather making.

Fig 19: High water use where paddles employed. Careful consideration for recycling is required.

Fig 20: Typical overflow wedge wire screen used for removal of coarse solids within recycling operations.

However, there is considerable scope for chemical and water savings, when using standardised pickling, tanning processes - especially natural *(undyed)* processing. It is noted that the chemical offers are based on float concentration instead of percentage offers based on weight as used when floats are comparatively low. This offers very close control where used floats discharged from vessels and drainings after pickling, tanning, retanning and fatliquoring can be recovered, separated, screened, and made up to concentration for reuse. For washing sequences, used final wash floats can be reused for first time washes saving water and energy, and lowering the capacity required for waste water treatment. Recycling can be very viable as there are many options to save chemicals, water, and energy.

2.11. The value of wool

Attention to the quality and value of wool is central to success in wool skin manufacture. And the requirements for fine wool processing are not always the best for leather manufacture. Also, the properties of the raw skin are a consequence of a requirement for wool. These factors create limitations for making these often-conflicting combinations work. In addition, wool recovery at all stages is an essential component in the viability of wool-bearing sheep skin manufacture at both cottage and major scale

6.0 General review

Although the most basic leather-making stages are comparable, the manufacturing finesse required by small skins differs strongly from the needs of bovine hides. The equipment required for skins is smaller and lighter, often with very specialised purpose. Moreover, a higher level of labour content is required, with an emphasis of individual attention as demanded by the smaller pieces.

Mechanical actions, chemical processes and handling reflect the differences in structure and end-use, together with variation in raw material supplies in terms of volume and quality that is not experienced in bovine manufacture.

In addition, there are quite different objectives within small skin manufacture too. For example, for grain leather manufacture – footwear, clothing and leather goods - the aesthetic value of the grain layer is of main concern. Especially the tightness and break characteristics, a defect free grain, and levelness of appearance and colour.

But with wool skins the focus is to develop the wool characteristics to specification. The leather needs to be soft and tactile too, but the emphasis is on the flesh part, as opposed to the grain. The appearance and handle of the flesh part – either suede or supporting a finish - must complement the appearance and texture of the wool.

Issues:

There are five issues in particular when comparing the processing of wool-bearing sheep skins to grain leathers from hair sheep and goat skins:

- The structure may be of higher substance, but is comparatively weak. This needs taking into account during processing to avoid further weakening, even delamination.
- There is a high grease content, and this needs removal, but leaves a weakened and more open structure.
- The wool must be retained intact.
- High alkali treatment – such as liming – must be avoided to prevent a coarsening of the wool. The leather must be soft, and

that is very dependent upon mechanical actions that provide a stretching or extension of the structure.

- The requirements for wool processing are often detrimental to good leather making.

To address these needs:

- Use of paddles and skin processors operating at a high float, with minimal mechanical action throughout chemical processes.

- Often intense fleshing and aqueous degreasing processes are needed to remove grease from the skin structure, and this often requires coupling with solvent degreasing.

- A heavy focus on the wool component throughout all operations. All wool shearings and trimmings need close attention as these are of high commercial value.

- A softening of the structure via an extended pickle based on selected organic acids. Heavy application of force in machine operations – fleshing, wheeling, setting and buffing - to extend the structure as part of the softening process.

- Very specialised dyeing's, with different requirements for both the wool and skin.

Credits:

- *Part 1, Figures 1 – 4 created by A. Mitchel.*
- *Part 3, Figures 3 – 4: created by A. Mitchel.*
- *Other images by R.P. Daniels at various locations.*

Concluded.

APLF
Serving the global leather & fashion industries

APLF ASEAN 2023 offers huge and growing market

APLF ASEAN, a highly anticipated trade fair in the leather and fashion industry, will hold its second special edition from October 25 to 27 in Bangkok, Thailand at the state-of-the-art Queen Sirikit National Convention Center (QSNCC).

Under the theme “ASEAN in Action”, the edition of the APLF will be held in the context of the 10-country ASEAN bloc that is now part of the Regional Comprehensive Economic Partnership (RCEP).

ASEAN in Action: Embracing RCEP

Following the recent signing of the Regional Comprehensive Economic Partnership (RCEP), the world's largest free trade agreement, ASEAN has certainly solidified its position as a dynamic economic power.

ASEAN, made up of ten Southeast Asian member states including Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam, is part of an RCEP, which allows them to trade under preferential tax treaties with Australia. , China, Japan, Korea and New Zealand.

Uniting the industry

Under the theme "ASEAN in action", APLF ASEAN 2023will bring together different stakeholders from the leather and fashion industry to explore new business opportunities, foster beneficial collaborations and showcase the latest trends and innovations.

In the previous edition of the event, APLF ASEAN featured around 250 local and international companies supplying leather (from raw to finished), chemicals, footwear components, fashion accessories and finished products.

The Queen Sirikit National Convention Center (QSNCC) is the venue chosen for this prestigious event, occupying pavilions 1 and 2 and covering an area of approximately 11,500 square meters.

Why ASEAN?

ASEAN is the third largest economy in Asia and the fifth largest in the world after the United States, China, Japan and Germany.

Countries such as Thailand, Vietnam, Cambodia, Malaysia, Philippines and Indonesia together create a strong manufacturing and trading center for leather and leather manufactures.

The world-class leather community imports more than $3.4 billion worth of hides, skins and raw hides, a figure very much on par with China. And more than $1 billion worth of leather goods, including footwear, bags and travel goods, are exported from the ASEAN region each year.

Supporting Partners and the ASEAN Market Advantage

APLF ASEAN 2023 has gained support from major tanning and footwear associations of ASEAN countries, including Thai Tanning Industry Association (TTIA), Vietnam Leather, Footwear and Bags Association (LEFASO), Tanners Association Indonesia (APKI) and ASEAN fashion accessories manufacturers. Philippines (FamPH). These partnerships help shed light on the exceptional sourcing opportunities available for leathers and materials in the region.

As Asia's third largest economy, ASEAN offers a dynamic market with a huge population of 660 million people and steady GDP growth, estimated at 4.6% by 2023. The region's strategic location and strong manufacturing industries. They undoubtedly make ASEAN a region with a good economic level, an excellent destination for global suppliers and buyers to do business.

MEET: a unique exhibition concept

APLF ASEAN 2023will present a unique trade show concept, known as

MEET: Matching, Education, Experience, and Tradeshow. This concept aims to offer a comprehensive and immersive experience for both buyers and exhibitors, ensuring valuable interactions and knowledge exchange. Under the MEET concept there are three prominent programs as shown below.

The Thai Leather Goods Designer Competition

Aiming to inspire and encourage design students in Thailand to explore the potential of working with leather. This competition serves as a platform for young talents to showcase their creativity and craftsmanship, while fostering a strong relationship between the design community and the Thai tanning industry.

ASEAN's top designers will showcase their iconic bag collections during the show and will be invited to collaborate with APLF exhibitors to create an exclusive APLF Edition collection . This collaboration will create unique and innovative leather goods that will be exhibited at APLF Hong Kong in 2024.

The Tanning Masterclass

This half-day workshop will take place on the first day and is designed specifically for local tanning professionals, chemists and technicians. This workshop aims to provide valuable ideas and knowledge to professionals and they will be offered the opportunity to learn from industry leaders, exchange ideas and improve their skills in tanning techniques, chemical processes and technical aspects. It serves as a platform to network and foster collaboration between local tanning industry professionals, ultimately contributing to the growth and development of the leather sector.

APLF ASEAN looks forward to welcoming participants from Southeast Asia and around the world to explore the vast potential of the regional market, forge new partnerships and drive the industry forward.

New interim CEO for TFL

TFL Group in press release has announced that 'the TFL Supervisory Board did not prolong the current contract of Dr. Wolfgang Schütt – CEO TFL Group - effective July 2023. Dr. Schütt has been with TFL for the past 2,5 years and we would like to thank him for his numerous contributions during the strategically and operationally important integration of Lanxess' Organic Leather Chemicals business as well as tactical projects and wish him the very best for the future.

With this change, we are announcing the appointment of Russell Taylor as interim CEO. Russell Taylor is currently on the TFL Board and is also the Executive Chairman of Bakelite Synthetics, a Specialty manufacturer of Industrial Chemicals and has been associated with Black Diamond Capital Mgmt. for several years. Prior to that, Russell Taylor has held leadership positions at several public and privately owned companies"

TFL is restructuring its production in Central Europe

Because of the ongoing weak development of the leather- and leather chemicals market in 2023 TFL is looking at its competitive framework and is reorganizing its production in central Europe. Consequently, TFL is planning to cease production at the plant (syntan plant) in Leverkusen, Germany, by end of 2023.

The chemical market in Europe and especially in Germany is facing serious profitability issues due to inflation and continued high energy costs (main impact on Germany because of the dependency on gas from Russia until 2022). In this context, TFL is taking measures to counter the weak performance of the specialty chemicals market for leather/the leather market in general.

"With the current market conditions, we have to review all our operations carefully and become more cost conscious", The TFL Interim-CEO Russell Taylor states, "we have to further streamline TFL in order to stay successful in the market and focus on the right segments to respond to altered market requirements and thus a shift of customer demand. We will continuously focus on sustainable solutions and bio-based products such as our TFL PURE range and we want to further strengthen our position and leading role in offering great chemicals to meet all possible bisphenol regulations in the EU."

The reorganization and optimized utilization of production sites is a consequence. TFL is precisely planning this step in order to conduct execution with always keeping customer requirements in mind.

LANXESS study proves: Biocides in leather harmless to consumers

- **No migration of biocide residues from leather detectable**
- **Leather contact safe for end users**

Biocides required for the preservation of leather intermediates do not migrate out of the finished leather articles. This has now been proven in a study by the renowned FILK Institute in Freiberg, Germany. Thus, there is no risk for end consumers when wearing or getting in contact with leather products. To clarify this issue, specialty chemicals company LANXESS commissioned a study by the independent Institute for Material Testing.

The results of the migration study are critical for assessing the potential risks associated with biocide residues in leather articles. By measuring the amounts of biocide migrated, experts can assess the likelihood of human exposure and any associated risk.

In order to represent a wide range of applications, different types of leather were produced and tested: Automotive leather, shoe upper leather, garment leather and furniture leather. The samples were treated with the fungicides OPP, CMK, OIT and TCMTB, which are most commonly used in leather production. They prevent the growth of mold in leather intermediates and thereby inhibit the decomposition of the leather intermediates. The substances play an important role in the quality of the leather. All four fungicides achieved the expected results in all types of leather. Migration of biocide residues was not detectable.

Biocides in the leather manufacturing process

Leather production is a complex process that involves several steps to transform raw animal hides into high-quality leather. A crucial aspect of this is the use of biocides, which protect intermediate leather products from microbial growth and spoilage.

Biocides such as PCMC (4-chloro-3-methylphenol), OPP (orthophenylphenol) (2-phenylphenol), OIT (octylisothiazolinone) and TCMTB (2-(thiocyanomethylthio) benzothiazole) are widely used in

the leather tanning process. They prevent microbial attack, decay and spoilage in leather intermediates, including Wet Blue and Wet White. Their antimicrobial properties provide effective preservation of leather intermediates during production and storage.

Despite a thorough and state-of-the-art processing and treatment, finished leather products may contain biocide residues. This can raise concerns about potential risks to consumers who wear leather items such as shoes, bags and garments and thus have direct skin contact. “Our current migration study is therefore critical in providing insights into the migration of biocides from leather products. The study simulated the conditions to which leather products may be exposed during their life cycle,” says Andreas Weckmann, Technical Application Manager Leather at LANXESS.

Satisfactory results

The migration test investigated whether the four biocides migrated into a cotton fabric soaked with artificial sweat solution. All measured values were below the detection limit.

“The fact that there were no detectable biocide residues in the cotton fabrics soaked in sweat solution means an additional level of safety for the consumer. The results of the study prove that the unwanted biocide residues from the unavoidable preservation in the leather manufacturing process do not migrate out of the finished leather article,” emphasizes Weckmann.

LANXESS is one of the leading manufacturers of biocides and biocide-containing formulations. The product portfolio includes the important preservatives OPP and PCMC. Both are known to be safe biocides and are therefore used for a wide range of applications. The phenolic active ingredients are degradable at low concentrations in biological wastewater treatment plants and in the aquatic environment.

One of the most important LANXESS products for leather preservation is Preventol U-Tec G, which consists of more than 90 percent pure active ingredients and combines the strengths of phenolic biocides (PCMC and OPP) and the electrophilic-active OIT. It is applicable to all tanned hides, i.e. wet blue, chrome-free leather and vegetable tanned leather.

DyStar Releases 2022-2023 Integrated Sustainability Report

DyStar, a leading specialty chemical company with a heritage of more than a century in product development and innovation is pleased to announce the release of its thirteenth annual Integrated Sustainability Report. The report is prepared in accordance with the updated GRI Standards 2021: Core Options. Despite the challenging business landscape and economic situations, DyStar remains committed to delivering tangible values that the Group has strategically created through the six major capitals, using the Integrated Reporting <IR> framework.

Mr. Xu Yalin, Managing Director and President of DyStar Group said, "The report clearly showcases DyStar's unwavering dedication to sustainability, reaffirming its role as both a manufacturer and supplier of innovative solutions in this field.

DyStar's value-creation model will continue to support our stakeholders, including brands and retailers, direct customers, and producers in their pursuit for a sustainable quality product that can help them save valuable resources as well as being climate-impact compliant."

DyStar's business strategies have proven their effectiveness and delivered significant progress toward its 2025 targets. As a leading global manufacturer and supplier, the company has successfully reduced its **environmental footprint in Greenhouse Gas Emission intensity and Wastewater production intensity by more than30%**, compared to the baseline year 2011.

More specifically, DyStar's Scope 1 and Scope 2 Greenhouse Gas(GHG) Emissions intensity was **45% lower**(tCO_2e per ton production) than the baseline year 2011, with a totaled GHG emission of **56.91 thousand tCO_2e**. This is also **9% lower** when compared to FY2021.

Similarly, for Wastewater production intensity, DyStar **achieved a 52% reduction** compared to baseline year 2011, and a**24% reductionfromFY2021**.

Some other key highlights and value-adds include (when compared to FY2021):

- Financial Capital: The results of production efficiency and streamlining manufacturing indirectly contributed to the reduction of 5.8% in operating cost
- Manufactured Capital: Apart from ensuring quality suppliers through DyStar's internal audit, DyStar's effort on environmental performance and climate impacts with the Institute of Public & Environmental Affairs (IPE) was recognized and ranked second by industry on IPE's Green Supply Chain Corporate Information Transparency Index (CITI)
- Intellectual Capital: The innovative Cadira® modules continue to support the supply chain with a lower carbon footprint
- Human Capital: The full launch of DyStar University (DSU), a proprietary LMS, supports the learning and development of employees globally
- Social Capital: DyStar's culturally diverse workforce organized a variety of activities and events in support of its global community and made a total contribution of USD 128,946 to various corporate social responsibility ("CSR") program.

Despite the harsh economic headwinds, these figures further demonstrated the effectiveness of DyStar's initiatives that were installed throughout the reporting year.

DyStar maintains a cautious yet optimistic outlook on its global performance. As we confront the challenges that lie ahead, DyStar firmly believes that maintaining resilience is paramount to successfully navigating the forthcoming turbulence.

The report communicates DyStar's progress towards its sustainability agenda and material topics. In line with the Group's environmental sustainability commitment, only an e-magazine and a PDF version will be made available for download from www.dystar.com/sustainability-reports/

5th Sustainable Leather Forum

The Sustainable Leather Forum (SLF) is the first international event dedicated to CSR (Corporate Social Responsibility) in the leather industries. Held in the heart of Paris, France on 11th September, it gathers more than 400 international participants – businesses operating in the sector, major fashion and design corporations, SMEs, micro-businesses, mid-sized companies, institutional bodies, opinion leaders and consultancies – to focus on social, environmental and economic issues.

The conference, which turned into an international organization, took place in 4 sessions. Frank Boehly, president of the French international leather council, made the opening speech and included the solutions and sustainability of the problems under the guest speakers and the determined main headings on their agenda. He also said that when the Sustainable Leather Forum launched in 2019, he would not have guessed that the event would have run for five years, but he said the high levels of loyalty that companies and individuals have displayed for the event and their desire to keep learning about advances in sustainability had made it possible to keep holding the conference.

As a unique platform for sharing the CSR best practices of the leather industries sector and its ecosystem, the SLF is an invaluable source of key information to help shape the CSR strategy of companies and support them in their transformation. Over the course of an exceptional day, international experts and companies had the opportunity to speak during keynotes, round tables and debates punctuated by networking sessions.

94th Annual Meet: ICHSLTA's New Board

The International Council of Hides, Skins, and Leather Traders Association (ICHSLTA) held its 94th Annual General Meeting at the ACLE fair in Shanghai on August 29th. At the meeting, ICHSLTA members reviewed a number of issues related to the trade of hides and skins globally, and more particularly the misuse of the word leather to describe non animal sourced material.

The Council also held its election for officer positions. The Council re-elected Toni Baltes from German Wirtschaftsverband Häute/Leder e.V. as their President as well as Dennis King from Australian Hides Skins and Leather Exporters Association and Nick Winters from French Hides Association as their Vice Presidents. Lénaïg Manéat of the French Hides Association – Federation Française des Cuirs et Peaux in France continues managing the organisation.

Toni Baltes is also the current President of the German Hides Association and Managing Director of A+B HIDES GmbH & Co. KG. He began working in the raw hide trade with an apprenticeship in his parents' business. After that he completed further training at both national and international raw hide processing facilities and leather factories. He has gained more than 40 years of experience in the trade.

Toni Baltes commented that, "It was a pleasure to be able to hold our AGM in Shanghai and shake hands with our friends and colleagues from around the world. Our industry has changed in the aftermaths of the pandemic and the final consumers' expectations, often driven by "so-called" more ethical, sustainable consumption choices. One of our objectives over the next couple of years will be to restore the good reputation of leather that it deserves. Leather is among the most natural, sustainable and beautiful materials available to manufacturers of all kinds of products. As President of ICHSLTA I look forward to working towards our common goal and would like to thank my colleagues for their renewed trust."

Leather Innovations PART – II

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Leather Innovations Part - I, II & III	
PART – I	**PART – II**
Introduction, What is Innovation? Importance & Application of Different Types of Innovation, The Doblin Innovation Framework,	Reasons Why Innovation is Important, Challenges encountered by Leather Industry, Innovation Trends,
Innovation Management, Innovation cycle with activities at each stage, Factors influencing an organization's ability to manage innovation,	Innovations in Strategy, Innovative Action Plans for reversing the Declining Indian Exports, Changing Use of Leather, History Lessons, The Future of Leather,
Innovation funnel, Why innovation matters, The Innovation Matrix,	Cluster Development - Leather and Footwear Clusters in India, Product & Process Innovation,
Innovation Models | Innovation Process Models | Examples, Innovation in Manufacturing,	Cleaner Technologies at a Glance, Waste to Wealth, A Rationalized Leather Process for Wet-end,
Transforming India into a global manufacturing player, Key trends in Manufacturing Innovation, Innovation Activities in Manufacturing,	Green Technologies for the Leather Production, Eco-leather portfolio Current situation - Types of tanning,
The $ 100 Trillion World Economy, India on course to become $30 trillion economy in 30 years, The Emergence of China and India as new innovation power houses,	Innovation – Highlights – Leather Colourants Eco-benign Management Options for Cleaner Chrome Tanning

Leather Innovations Part - I, II & III	
PART – I	**PART – II**
A World Class Indian Innovation Ecosystem, Categories of Winning Leap solutions, Innovation Council, GLOBAL INNOVATION INDEX, Few quotes which endorse sprit of innovation,	Vegetable Tanned Leather - 100% Vegetable Leather, Customer Support & Application Research,
What is a startup? A startup ecosystem, Jugaad Innovation, Do it yourself (DIY), References.	Responsible Manufacturing, Traceability, References.

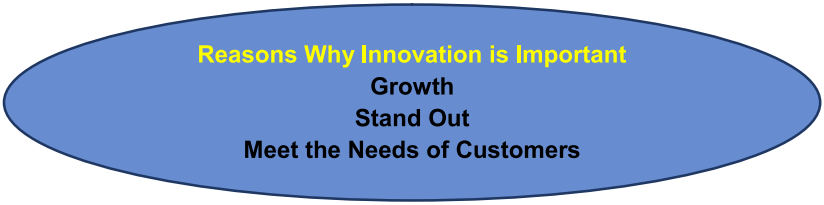
Leather Innovations PART – I, II & III
PART – III
What Will The Tannery in 2030 be like ?, The future imagined,
"What is the future of (chrome) tanning? Leather manufacture in the new millennium", Negative Publicity About Leather, A particular contradiction (contradicio in adjecto) is the term "vegan leather", Higgs Index & Leather Industry - Leather Industry Calls For Higg Index Review,
Responsible chemistry and Life Cycle Assessment, Cleaner production, Green Chemistry Principles, Best Available Techniques & BAT reference documents (BREF), Leather- example of circular Economy,
Regenerated Leather (RGL) & Regenerated Leather Composites (RLCs), Up cycling of Leather Waste to Create Up cycled Products and Accessories,

Leather Innovations PART – I, II & III
PART – III
Recycled Leather and Leather Alternatives, Type of Waste and Reuse /Recycling/Recovery and Treatment, Bonded leather fibres material, Comparison of the recycled leather fibres materials producers,
Synthetic, Recycled and Bio Leathers, Additional Information for Harmonious Coexistence - Leather and Leather Alternatives,
A general consensus in the industry not to use the word 'leather' for synthetic, polyurethane or polyvinyl chloride sheets or any sheets not originating from animal skins or hides,
Leather & Sustainability, Industry 4.0, Leather 4.0 and Industry 4.0 to 5.0 & Industry 5.0, Going Forward, References

1. Introducing Innovation can help

Introducing Innovation can help Table – 1 A
• improve productivity • reduce costs • be more competitive • build the value of your brand • establish new partnerships and relationships • increase turnover and improve profitability

1.1 Reasons Why Innovation is Important Figure – 1 B



1.2 Challenges encountered by Leather Industry

Challenges encountered by Leather Industry Table – 1 C
• Challenges to leather from Leather Alternatives – Synthetic Leather & Lesser extent from Recycled Leather, Bio Leather & Bio Fabricated Leather.• Environmental and economic issues – Responsible Manufacturing • Social pressures – Traceability • Technological changes – Safe Products & Processes
• Challenges to nations with natural abundance of raw materials: • Factors driving the future of global leather sector • Macro changes impacting leather sector • Review of process chemistry and tanning technologies in leather sector: a demand of the hour • NEGATIVE PUBLICITY ABOUT LEATHER DONE • Higgs Index & Leather Industry - LEATHER INDUSTRY CALLS FOR HIGG INDEX REVIEW
• "What is the future of (chrome) tanning? Leather manufacture in the new millennium". • Leather Sustainability • Recycling of Leather • Leather 4.0 and Industry 4.0 to 5.0 • Harmonious Living – Leather and Synthetics

Source : Table – 1 C .WHAT IS THE FUTURE OF (CHROME) TANNING? LEATHER MANUFACTURE IN THE NEW MILLENNIUMMEET IN AFRICA Casablanca, Morocco28 September, 2000.The framework for sustainable leather manufacture, Second edition. Jakov Buljan, Ivan Kraľ. 2019 by the United Nations Industrial Development Organization. Leather Innovation Challenges 2025SSIP – Italian Leather Research Institute

2. Innovation Trends Figure – 2 A

Three powerful innovation trends that will impact the industry in the coming years are

1. Digitization of products, their design, manufacturing, distribution and retail processes, consumer/end-user interaction, factories, workplaces and supply chains

2. Sustainability, circularity and resource efficiency of materials, processes and overall business operations; this trend requires transparent supply chains meeting the environmental, health and social legislation standards

3. New business and consumption models based on the sharing of productive resources and final products, servitisation, pay-per-use or subscription models, all moving us towards collaborative or sharing economy

Source – Figure – 2 A. CIRCULAR ECONOMY — CHALLENGES FOR THE TEXTILE AND CLOTHING INDUSTRY Małgorzata Koszewska Lodz University of Technology, Faculty of Management and Production Engineering, Department of Production Management and Logistics, Wolczanska 215, 90-924 Lodz, Poland malgorzata.koszewska@p.lodz.pl

3. Innovations in Strategy Figure – 3 A

Key Strategies adopted by these players include

- product launch, joint venture,
- acquisition, partnership,
- expansion, and investment.

Leading players in the global industry including Leather Industry, have adopted various strategies to achieve additional market share.

Source: Figure - 3 A. Pigments Market by Type (Azo, Phthalocyanine, Quinacridone, Titanium dioxide, Iron Oxide, Cadmium, Carbon Black, Chromium Oxide, Complex Inorganic, Classic organic, Metallic, High Performance, Light Interference, Fluorescent, Luminescent, Thermo-chromic) - Global Opportunity Analysis and Industry Forecast, 2014 – 2022 Allied Market Research, 2020. alliedmarketresearch.com

3.1 Purpose-led strategy - Clariant's purpose: "Greater chemistry – between people Figure – 3 B

Source : Figure 3B. Greater Chemistry–between people and planet January 2022 Conference Presentation. Clariant . investor-relations@clariant.com

3.2 Innovation Strategies Followed for Growth & Development

Innovation Strategies Followed for Growth & Development Table – 3C
• Merger & Acquisition Strategies – Strategic Innovation - Stahl completing acquisition of BASF Leather Chemicals, TFL buying LANXESS Organic Leather Chemicals business.
• New Product Launch – For Various Conventional and Non-conventional Applications.
• Cooperation and Support for Effective & Customer Oriented Marketing by suitable sourcing and Product Modification & Formulation Strategies.
• Forward & Backward integration in manufacturing for Market Share, Environmental Advantage & Cost Advantage. Also having activities in allied industries for better survival, growth development and sustainability.
• Product modification and formulation for the Customized Requirements of Customers.

4. Innovative Action Plans for reversing the Declining Indian Exports

The root cause analysis of this declining performance and strategy for remedial measures including innovations and action plans in the value chain are the need of the hour for growth and development.

4.1 INDIA'S EXPORT OF LEATHER & LEATHER PRODUCTS Value in US$ Mn [4]

INDIA'S EXPORT OF LEATHER & LEATHER PRODUCTS Value in US$ Mn Table – 4A							
Product	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Finished Leather	1329.05	1046.45	888.39	874.24	721.73	524.15	378.23
Leather Footwear	2278.18	2147.98	2128.87	2193.86	2195.47	2081.64	1485.55
Footwear Components	361.29	284.34	298.69	335.24	319.1	261.67	197.59
Leather Garments	604.35	553.11	518.96	518.96	468.48	429.11	295.56
Leather Goods	1452.83	1370.04	1365.22	1365.79	1434.24	1340.56	944.31
Saddlery & Harness	162.7	146.38	155.88	155.97	159.35	151.44	186.18
Non-Leather Footwear	306.44	306.74	296.68	296.91	392.63	281.97	194.16
Total	6494.84	5855.06	5646.79	5740.97	5691	5070.55	3681.58
% Growth	9.37%	-9.85%	-3.56%	1.67%	-0.87%	-10.90%	-27.39%

- As per officially notified DGCI&S monthly export data, the export of Leather and Leather products for the period April 2020 – March 2021 touched US $ 3681.58 Mn as against the performance of US $ 5070.55 Mn in April 2019 – March 2020, recording a decline of 27.39%.

- The root cause analysis of this declining performance and strategy for remedial measures including innovations and action plans in the value chain are the need of the hour for growth and development.

Reference: 4. & Table – 4A.COUNCIL FOR LEATHER EXPORTS (CLE), Highlights of Product Segments of Indian Leather and Footwear Industry https://leatherindia.org/indian-leather-industry/

4.2 Some action plans suggested

Some action plans suggested are presented below.

- Investing in R&D, Building enough scale and skill development of workers.
- Providing value to the product with good branding and differentiator.
- Effective control and implementing action-based strategies for effluent management, non-tariff barriers, quality specifications and cost of compliance to various standards for growth of the Indian leather industry.
- Productive efforts by Industry, Support by Government and Effective Cooperation by related agencies and organizations.
- The global leather industry is in the process of shifting its manufacturing base from developed to developing nations. This provides an opportunity for increased flow of foreign direct investment (FDI) into India.

5. Changing Use of Leather HISTORY LESSONS, THE FUTURE OF LEATHER

Changing Use of Leather HISTORY LESSONS, THE FUTURE OF LEATHER Table – 5 A
• The uses of leather have changed and continue to change. In some cases, leather has lost its prime position as it could not compete with new materials developed during recent decades. At the same time the use of alternative materials was called for in many areas due to limited availability of leather. • One of the main threats for leather are new materials and substitutes with superior properties. Ski boots offer a good example. • The variety of requirements and combination of properties such as waterproofness, stability (softer or harder skeleton), warmth, support (foams hold the foot firmly in the boot without compromising on comfort) is impossible to achieve with leather, and that it is why it is no longer used in ski boots. Other examples are leather (protective) headgears, used in contact sports, by pilots, and in the mining industry.
• The case of sport shoes is also quite illuminating. In the 1970's- 80's white leather was used almost exclusively for sport shoes. However, with the increase in the production of athletic shoes there • was a shortage of leather for this growing market. At the same time, it became quite difficult to achieve some high-performance parameters required for sport shoes. Furthermore, the price comparison was in favour of synthetic materials. Now athletic shoes are mostly fully synthetic.

5.1 The following are some examples illustrating dramatic changes that took place in the last few decades. Figure – 5 B &5 C&5 D

Some entirely new uses of collagen:

However, the reversal to leather in the automotive industry seems more than to balance it off:

1 set of car upholstery = 40 – 70 pairs of shoe uppers

Source : Table – 5 A & Figures – 5 B & 5 C. & 5 D. The framework for sustainable leather manufacture, Second edition. Jakov Buljan, Ivan Kraľ. 2019 by the United Nations Industrial Development Organization.

6. Cluster Development - Leather and Footwear Clusters in India

6.1 Industrial Clusters[6]

Industrial clusters are groups of firms in a defined geographic area that share common markets, technologies and skill requirements. An important aspect of clusters is the nature of inter-firm networks and interactions.

Clusters where firms specialize in one stage of the production process and supply inputs or absorb the output of another firm in the cluster is critical to the efficiency and competitiveness of the cluster.

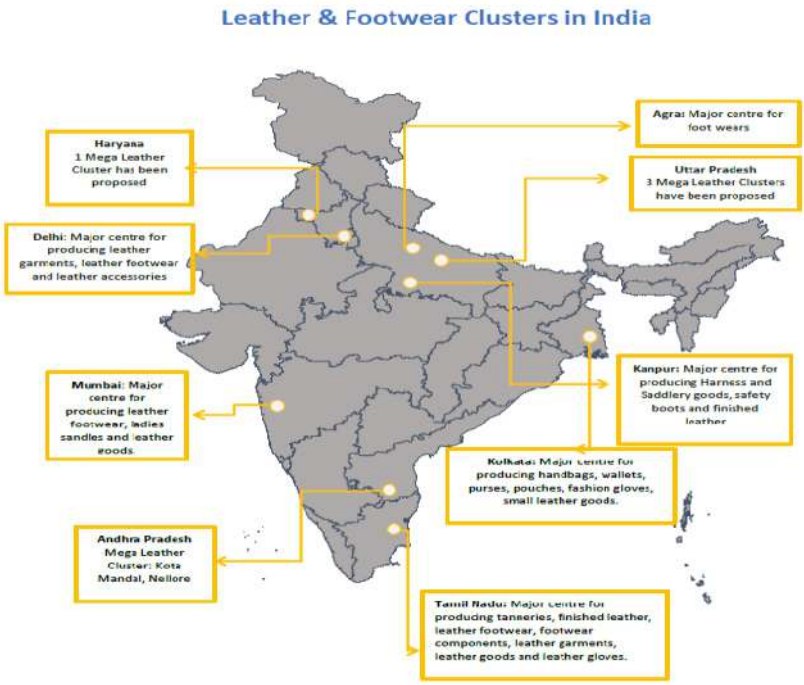
6.2 The chief characteristics of a successful cluster Figure – 6 A

The following are the chief characteristics of a successful cluster.

- **geographical proximity of small and medium enterprises (SMEs). sectoral specialization.**
- **close inter-firm collaboration. inter-firm competition based on innovation. a socio-cultural identity, which facilitates trust.**
- **multi-skilled workforce. active self-help organizations, and supportive regional and municipal governments.**

Source : 6 & Figure –6 A . Industrial Clusters in Tamil Nadu, August 2021

6 .2 Leather & Footwear Clusters in India Figure – 6 B



Source : 6 B. Invest India. National Investment Promotion & Facility Agency

7. Product & Process Innovation[7]

New materials, molecules and technologies and the production of innovative leather families, both in relation to the manufacturing processes used and to the ability of simultaneously satisfying a series of innovation and sustainability needs.

Some Potential Innovations in Leather Table –7 A

The following is an almost random selection of some more recent ideas and methods at various stages of research and development.

• Application of ultrasound in chrome tanning and retanning

A combination of wringing and ultrasound in a two-step process (penetration and basification tank) is used to accelerate the chrome tanning process based on the mechanical extrusion formation of the micro-vacuum and ultrasonic cavitation effect.

Similarly, the effect of ultrasound (US) has been investigated in improving the penetration and uptake rate of different syntans (phenolic based, melamin resin, acrylic compound) in leather retanning and compared with magnetic stirring (MS). Favourable influence of pre-sonification of both the substrate (leather) and the syntan solution result in a considerable improvement of the diffusion rate, a shorter processing time and better leather quality.

• Inverse chrome tanning with wet-white pretanning

The proposed process sequence is: bating, washing, white pretanning, sammying, shaving, weighing, re-wetting with acidification with formic acid, retanning (synthetic fatliquor/ dispersing syntan/acrylic resin/mimosa, phenolic syntan, melamine resin/formic acid), fatliquoring (synthetic fatliquor, formic acid), drain, followed by the usual chrome tanning with basification (100% fresh float, 14% chrome powder). The main gains should be chrome emissions limited to one process only and reduced by about 50% plus chrome-free shavings. There is no information about other pollutants (BOD,COD, salts etc.).

• Collagen modification and nano technologies

Some R&D establishments, in particular in Xian, China, have been searching for ways to depart from using traditional, chemical- based leather making methods. Instead, they are looking into various options for modifying collagen fibers by nano-size emulsions, clay minerals, nano silicon dioxide or nano silver and nano technologies in general.

• A fresh attempt with Fe tannage

One among many attempts in searching for alternatives to the prevailing tanning methods is tanning with Fe2+-gluconic acid compound, apparently still at the laboratory scale.

• Elimination of free formaldehyde with essential oil

The conclusion of one study is that the release of free formalaldehyde from tetrakis (hydroxymethyl) phosphonium (THP) salts and various syntan leather products can be supressed by using Origanum onites essential oil.

Some Potential Innovations in Leather Table -7 B

• Bio resistance by application of nanosilver

A combination of the colloidal silver solution (CSS) and poly hydroxiurethanes is used to interact with collagen or keratin from medical leather and sheepskins to induce bio resistance properties against fungi as well as a good antibacterial action.

• The ISO 17075 method for Cr6+ detection

The ISO 17075 method for Cr6+ detection (at pH 8) systematically gives false positive values. Moreover, Solid Phase Extraction (SPE) cartridges absorb about 10% of chromate; thus, the calibration curves should be obtained after filtering each standard with the SPE employed.

• Chromogenic leather

There are already reports on tests with chromogenic leather, i.e., leather that changes colour in response to optical/thermal changes.

• Biochemical degradation and closed cycle dechroming of chrome shavings

There are new investigations into the scope of combined chemical and enzymatic degradation of chrome shavings and protein extraction. Also, Ethylene Diamine Tetraacetic Acid (EDTA) is used

for dechroming chrome shavings during extended processes involving heating, UV light (photocatalysis), chrome precipitation with NaOH and acidification with sulphuric acid. High chrome removal efficiency and preservation of the collagen triple helix are claimed in these mini-lab scale tests.

Some Potential Innovations in Leather Table - 7 C

• Highly biodegradable leather

A success is claimed in developing an aldehyde based tanning system resulting in leather showing biodegradability four times higher than chrome tanned and two times higher than wet-white based leather. Full disintegration of leather under composting conditions according to ISO 20200:2004 was reportedly achieved within 11-14 days as well as of footwear made of biodegradable components and with uppers and linings of leather tanned by the new system within 21 days.

• Composting

A new attempt in composting tannery waste at the industrial scale is underway: dewatered sludge with dry matter content of 20-25%, fleshing and grease residues are mixed with shavings from vegetable tanning, grass and green farm residues. From time to time some quantities of cow and horse dung are added. Composting takes place in two-months cycles in windrows in a roofed area. It is reported that the Cr content is about 1500 mg/kg calculated on dry weight, which is, after mixing with other organics, reduced to about 1000 mg/kg to be used as a nutrient and soil conditioning agent.

• Probiotics

Some biotech products, marketed as fully biodegradable and non-hazardous probiotics, claim to offer a viable alternative to and ability of replacing some conventional chemicals for most leather manufacturing stages. At the moment it does not appear to be widely implemented.

Some Potential Innovations in Leather Table - 7 D

• Application of nanotechnology

There is apparently no confirmation of successful industrial scale application of nanotechnology that can strengthen sheep skins to be converted into leather for use in shoes and other products reported in 2014 with the potential of applying the same process with deerskins and cattle hides.

• Ionic Liquids as chemicals for leather processing

Ionic liquids (ILs) such as imidazolium, choline and some others have been found to have both stabilising and destabilising effects on collagen - at the molecular level, thermal and dimensional stability at the interfibrillar level and at the fibre structure level. Their properties can be garnered and fine-tuned for various applications in leather processing. ILs, the greener solvent media, are seen as potential advanced “designer” chemicals for making leather processing cleaner and greener

• Analysis of odour compounds in leather by GC-MS and GC-Olfactometry

The volatile compounds in leather are extracted using a solid-phase micro extraction fiber and subsequently identified using a gas chromatography-mass spectrometry (GC-MS) and

gas chromatography olfactometry (GC-O), i.e., human assessors. More than 20 volatile compounds have been identified by GC-MS, the main among them being hexanal, heptanal, octanal, nonanal, heptanol, octanol, 2-ethoxyethanol, and 2-buthoxyethanol. Aldehyde such as octanal and alcohol such as octanol were characterized by GC-O.

• Bio-based polyurethanes for leather finishing

Until recently, coating technology for the finishing step of the leather process has largely been based on petroleum feedstock chemicals, like ethylene and propylene. Recent advances in biotechnology have made it possible to develop an entirely new class of aqueous polyurethanes. This class of polyurethanes are bio-based, derived from renewable raw materials and reportedly show superior film performance. Certain polyols (bio-based polyols), the main building blocks in making polyurethane finishes, can be made using different plant oils such as canola(rapeseed), soy, palm or linseed. The bio-content level achieved so far can range from 10-35%.

Source : Tables - 7 A & 7 B & 7 C & 7 D. The framework for sustainable leather manufacture, Second edition. Jakov Buljan, Ivan Kraľ. 2019 by the United Nations Industrial Development Organization.

to be continued…

"Making Leather : An overview of Manufacture"

Mr Richard P Daniels, one of the renowned leather technologists, has recently come out with a study **"Making Leather: an overview of manufacture"** intended for people entering the leather sector who aspire to become technicians. This study is based on his rich technical experience from training (basic to MSc level and counterpart both directly also distance learning modules that he has authored plus numerous profiles/reports and field works etc.etc).. This was released at the IULTCS Congress in Ethiopia and is recommended by UNIDO, IULTCS and SLTC (going on their websites).

It contains information for those who need more than the most basic understanding of commercial leather manufacture. It follows the processes and operations used, and their purposes for making leather from bovine hides, sheep and goat skins. This study is intended for self-training and distance learning within the global leather sector. This great work is divided into 10 parts comprising 30,000 words in a condensed format and 300 integrated technical images/diagrams. It is essentially a self learning package and designed for use by smart phone, tablet and computer. It suits display and use by suitably qualified staff within formal education for discussion and expansion.

The author has gracefully made this comprehensive study available to readers at free of cost in our website. It is about making leather!

Please visit our website:

www.indianleathermagazine.com

and click "Articles Tab" to view this great work.

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