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Synopsis of Objectives

- An Association with over 550 members from India and abroad working since last 72 years for the growth and development of Leather and its allied industries.
- Organize seminars, symposiums, workshops in order to share information, knowledge & latest development and interactions for the benefit of all concerned.
 - Organize Human Resource Development programmes on regular basis.
 - Publish for over 72 years, a technical monthly journal namely "Journal of Indian Leather Technologists' Association" (JILTA), widely circulated through out the World.
 - Publish books for the benefit of the students at various levels of study, for the Research Scholar and the Industry.
 - Work as interface between Industry and the Government.
 - Assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies for the growth of the Industry.
- Assist small and tiny leather goods manufacturers in marketing their products by organizing LEXPOs in Kolkata and different parts of India.



Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies]

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Portfolio_____

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

Indian Leather Technologists' Association is a premier organisation of its kind in India was established in 1950 by Late Prof. B.M.Das. It is a Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS).

The Journal of Indian Leather Technologists' Association (JILTA) is a monthly publication which encapsulates latest state of the art in processing technology of leather and its products, commerce and economics, research & development, news & views of the industry etc. It reaches to the Leather / Footwear Technologists and the decision makers all over the country and overseas.

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(Member Society of International Union of Leather Technologists and Chemists Societies)

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Stahl Corner

Tell me and I forget, teach me and I may remember, involve me and I learn

Stahl Campus[®]



As an active proponent of responsible chemistry, Stahl has established the Stahl Campus[®] training institute in its Center of Excellence for sustainable leather technologies in Kanpur. With our Stahl Campus[®] Leather Modules, we can offer training and information, such as responsible chemistry and sustainability in leather production. We believe that in this way, we facilitate transparency that inevitably will lead to a better supply chain with responsible chemistry.

Our approach is modular, making it easy to tailor learning programs to specific needs. Stahl Campus[®] has at its core the drive to unlock human potential and make that new competitive advantage. By providing the possibility of sharing knowledge, we embrace our role in the dynamic leather and chemical industry. Stahl Campus[®] is a great opportunity to strengthen skills and capabilities in order to make working methods more efficient by sharing experiences and studying products and procedures.

If you're interested to receive more information on Stahl Campus®, please contact Prasanna Maduri (Prasanna.maduri@stahl.com).

If it can be imagined, it can be created.





Stahl Corner







STAHL TAKES NEXT STEP IN STRATEGIC JOURNEY WITH REFRESHED VISUAL BRAND IDENTITY



Stahl, the world leader in speciality coatings and treatments for flexible substrates, proudly announces the launch of its new visual brand identity, marking an important step in Stahl's strategic journey.

This transformative initiative marks the next step in Stahl's strategic journey, aligning the company's visual brand identity with its purpose and strategic direction. In recent years, Stahl has been evolving its positioning and offering to meet the changing needs of its customers and markets and to drive the next phase of its growth. In particular, the rebranding project follows the recent acquisition of Stahl Packaging Coatings (formerly ICP Industrial Solutions Group) as well as the launch of Stahl's new purpose:fl *Touching lives, for a better world.* The purpose encapsulates the company's commitment to making a positive impact on the world, reflecting not only Stahl's proud heritage, but also its future influence as the world leader in speciality coatings and treatments for flexible substrates.

Maarten Heijbroek, CEO of Stahl, stated, 'Launching our new visual brand identity is an important milestone in our strategic journey. Building on our proud heritage, it offers a visual representation of our vision for the future, capturing our commitment to leading in innovation and sustainability and supporting the changing needs of our customers and markets. This will ensure that the world sees Stahl as it is today: a purpose-driven business built on three distinct pillars – Leather, Performance Coatings and Packaging Coatings – and a company leading in sustainable, high-value-added solutions. Meanwhile, our products continue to be touched by consumers far and wide, as they are applied to essential everyday materials in countless industries and markets. With our dynamic new look and feel, we can now tell our story in a way that resonates with our stakeholders around the world.'

Stahl's new logo is at the heart of Stahl's refreshed visual identity, symbolising the unique 'touch' of Stahl and the transformative qualities of its coatings and finishes. Stahl has also introduced a new colour palette to help visualise and differentiate its activities and its approach to sustainability and other strategic topics.

(Stahl News - 03/01/2024)





CUSTOMIZED LEATHER FINISHING



Stahl offers versatile leather finishing solutions that help manufacturers ensure safety and reduce their environmental impact. Our chemicals support a variety of needs – from leather upgrading to color finishing. And with our technicians close at hand, we can formulate custom finishing systems to your requirements.

Stahl's leather finishing portfolio helps leather manufacturers achieve a range of high-quality finishes in a safe and responsible way. Our chemicals meet international safety and environmental requirements, including the Zero Discharge of Hazardous Chemicals (ZDHC) Manufacturing Restricted Substances List (MRSL). Many of our leather finishing solutions are included in our low-impact Stahl Neo® portfolio.

LEATHER FINISHING PROCESS:

After the wet-end leather production process, the leather is treated with coatings and upgrading solutions to change, improve, or develop its appearance or characteristics. This process is called leather finishing. The first step is to apply upgrading solutions that cover grain defects, using stucco. Next, the basecoat – which forms the base for the leather design – is applied. Finally, the leathers are finished with a topcoat to support the manufacturer's visual and physical specifications. The final coloring is also applied to the topcoat, which levels the color of the leather. With specific topcoats, you can also create matt or gloss surfaces.

LEATHER FINISHING SOLUTIONS:

We offer a variety of finishing solutions that support the production of multiple types of leather.

LEATHER PREPARATION:

Create high-performance bases, sealers, and topcoats with our leather preparation portfolio, which includes oils and waxes, auxiliaries, protein binders, dullers, fillers, or hand modifiers.



LEATHER ENHANCEMENT:

Produce premium-quality leathers efficiently with our leather-enhancement solutions. Our portfolio supports a wide range of requirements – from solvent-borne lacquers and waterborne emulsion lacquers to upgrading solutions and penetrators.

LEATHER PROTECTION:

Protect and enhance leathers with our protection solutions. Our acrylic resins, butadiene and hybrid resins, compact resins, impregnation resins, polyurethane resins, solvent polyurethanes, velour finishes, water repellents, water-based topcoats, and crosslinkers support a variety of applications.

COLOR FINISHING:

Stahl's color finishing solutions allow manufacturers to access new design possibilities. Our portfolio includes organic, inorganic, and iron oxide pigment types that produce a full spectrum of color grades, including metallics.

SYSTEM SOLUTIONS:

Add value to leather with our system solutions. Manufacturers can select from a diverse portfolio of systems including upgrading solutions, impregnations, casein finishes, easy-KATs and beauty makers, finishing resins, and patent systems.

Stahl has a complete portfolio of leather finishing chemicals, which enables leather manufacturers to achieve a wide variety of leather finishes. Browse the links *https://www.stahl.com/leather/finishing* to find the products you need.

Leather Preparation	Oils & Waxes			Acrylic Resins
	Auxiliaries			Butadiene & Hybrid Resins
	Protein Binders			Compact Resins
	Dullers			Impregnation Resins
	Fillers & Filler Oils Hand Modifiers Casein Selection Guide		Leather protection	Polyurethane Resins
				Solvent Polyurethanes
System solutions				Velour finish & Water Repellent
	Easy-KAT & Beauty Maker			Water-based Top Coats
	Resins Performances			Crosslinkers
	Patent Systems			Aqueous Pigments
Leather enhancement	Solventborne Lacquers		Color finishing	Liquid Dyes
	Waterborne Emulsion Lacquers			Lacquer Pigments
	Miscellaneous & Upgrading			
	Penetrators		(Source: https://www.stahl.com/leather/finishing)	





PIELCOLOR: INNOVATIVE LEATHER-FINISHING SOLUTIONS THAT FUSE SUSTAINABILITY WITH STYLE



PielColor is a distinctive brand within the Stahl Group. Its focus is on innovative leather-finishing solutions that meet the needs of today's evolving and environmentally conscious leather sector.

With a well-established reputation in the high-end fashion segment, the PielColor name is synonymous with style as well as sustainability. PielColor solutions are used by many of the world's leading fashion brands and leather manufacturers to produce attractive, forward-looking applications that don't cost the earth.

A PROVEN TRACK RECORD OF INNOVATION

Over the past 35 years, PielColor has delivered a steady stream of quality leather-finishing innovations. They include Magic Line, PielColor's proven and highly popular family of leather upgrading products. In 2021, PielColor introduced a new generation of high-performance water-based topcoats that enable a lower environmental impact. All PielColor products are designed with sustainability in mind and are 100% compliant with REACH legislation.

EXPERT TECHNICAL SUPPORT

Alongside its high-end product range, the PielColor team is well known for its deep expertise and for the unrivaled technical assistance that it provides to customers. These qualities have seen PielColor become a trusted advisor to leather manufacturers and fashion brands all over the world.

(Source : https://www.stahl.com/pielcolor)



A Look at Latin American & Indian Economic Trend



Latin America currencies had an eventful 2023. Some, such as Argentina's peso and Venezuela's bolívar, crumbled amid hyperinflation and elevated money printing, while others, such as the Mexican and Colombian pesos, strengthened significantly. Economic panelists' forecasts suggest that 2024 will maintain this pattern of extreme divergence between currencies. Economic panelists expect virtually all Latin American currencies to depreciate this year compared to the U.S. dollar. This is because interest rates in the region are forecast to fall far more quickly than in the U.S., narrowing the positive interest rate differential that Latin America currently enjoys visà-vis the U.S. and thus weighing on currencies. For instance, Consensus goes for the central bank's policy rate to fall by around 200 basis points in Mexico and close to 500 basis points in Colombia in 2024, compared to our expectations of around 100 basis points of cuts by the U.S. Fed. At the meeting ending on 13 December, the Federal Open Market Committee (FOMC) left the target range for the federal funds rate at 5.25%–5.50% for the third straight meeting. The decision was driven by the Fed's desire to assess the impact of past rate hikes, which total 525 basis points since early 2022. Price pressures have come down sharply so far this year, meaning there was no need to continue hiking. On the flipside, with both headline and core inflation still both above the Fed's 2.0% target range, it was premature to begin monetary easing. Looking ahead, the Fed's own projections are for the midpoint of its federal funds rate range to end 2024 at 4.6%, compared to 5.1% in its previous forecasts made back in September. This is broadly in line with the forecasts of our panelists, which are for the upper bound of the federal funds rate range to be around 4.6% by end-2024. That said, the discrepancy among panelists is wide: the spread between the minimum and maximum policy rate forecasts for end-2024 is 275 basis points.

On the latest meeting and outlook, DBS' Taimur Baig said: "Unless activities and inflation slow drastically, Fed policy is likely to remain on hold in 1H24, in our view. Although market pricing has shifted the first cut to March 2024, we will hold on to our call for first cut to be in July. We think quantitative tightening will continue at least till then."

United Overseas Bank's Alvin Liew sounded slightly more dovish:

"We keep our projections for the FFTR to remain unchanged and continue to expect the Fed to maintain its current FFTR at 5.25-5.50% through mid-2024 where we price in 75bps of rate cuts for 2024 (i.e., three 25-bps cuts, one each in Jun 2024, 3Q24 and 4Q24 respectively."



Argentina's peso and Venezuela's bolívar are projected to continue their sharp descent in 2024. Our Consensus is for both currencies to lose over half their value over the course of the year, due to limited investor confidence, informal dollarization and triple-digit inflation. Economic panelists expect the Argentinian peso to end 2024 at ARS 1,700 per USD, compared to just ARS 808 per USD at the end of 2023, and for Venezuela's bolívar to slip from VEF 36 per USD to VEF 93 per USD.

Editorial ____



Chile is the only major Latin American economy whose currency is projected to gain ground this year—albeit marginally. The apparent end of the drawn-out process to reform the country's constitution following December's referendum should boost investor confidence and support demand for the peso, which will also benefit from foreign interest in the country's renewable energy and mining sectors.

Beyond 2024, Economic Consensus is for Latin American currencies to depreciate on the whole against the U.S. dollar. A similar combination of factors to past years will be at play: Persistent current account deficits, political uncertainty, soft growth prospects and higher inflation than in the U.S.



On Argentina's peso depreciation and its impact on other variables, Itaú Unibanco analysts said: "We now expect a nominal exchange rate of ARS2000/USD by YE24, from ARS1,550/USD in our previous scenario mostly due to a higher-than expected devaluation of the currency in December 2023. We revised our inflation forecast for 2024 up to 200%, from 150% before (with a likely peak in the first half of 2024), reflecting the pass-through effect of the recent devaluation of the currency and the correction of energy, transport, and fuel tariffs, among others. We estimate a GDP contraction of 2.5% in 2024, unchanged from our previous scenario."

On prospects for Chile's peso, EIU analysts said : "The Chilean peso has appreciated in recent weeks after the BCCh stopped its reserves accumulation programme prematurely and as disinflation in the US is easing uncertainty surrounding US monetary policy. The Ministry of Finance's programme to purchase US\$2bn every month between August and December to support the peso also appears to be working. We expect the currency to rally in early 2024 after the end of the constitutional reform process. The currency is then likely to strengthen gradually in real exchange-rate terms over the medium term, assuming that policy uncertainty abates. Firm copper and lithium prices (driven by high demand for base metals related to global investments in battery production) will also prove supportive."

India's economy has gone from strength to strength in recent years, with the country's GDP nearly doubling in nominal terms in the past decade to become the fifth largest in the world. Over the same period, real GDP growth has averaged around 6%, one of the best rates in Asia. However, despite substantial economic progress since the turn of the millennium, India remains a poor country in per capita GDP terms. India's economy is a complex mix of agriculture, manufacturing, and a rapidly growing service sector.

Agriculture employs a significant portion of the workforce, with major crops including rice, wheat, and cotton. Despite its significant role, the sector faces challenges like low productivity and inadequate infrastructure and is vulnerable to climatic conditions. Manufacturing varies from traditional village industries to modern industries like pharmaceuticals, automobiles, and textiles. The service sector, including IT and financial services, has seen rapid expansion, becoming a major GDP contributor in recent years; cities like Bangalore and Hyderabad are now known as IT hubs.

In 2014, the government launched a 'Make in India' initiative, which aims to turn India into a global manufacturing hub through courting FDI, improving infrastructure, offering financial incentives to firms and improving the ease of doing business. The country has had some success; for instance, Apple produced over USD 7 billion in iPhones from India in the 12 months ending March 2023.

India's trade policy has evolved from protectionism to liberalization in recent decades. That said, the country has steered clear of recently created trading blocs in the Asia-Pacific region, such as the CPTPP or the RCEP, due to concerns over foreign firms undercutting local producers, somewhat limiting access to overseas markets.

Editorial



In early 2023, India overtook China as the world's most populous nation; the demographic gap between the two will widen going forward. India's large and young population presents both challenges and opportunities. While it offers a vast labor pool and a growing consumer market, it also poses challenges in terms of ensuring sufficient job creation and skill development. The Consensus among analysts is for India to remain among Asia's top performers in the coming years, boosted by domestic political stability, a business-friendly reform agenda, strong population growth and increased interest from foreign firms looking to diversify supply chains away from China. Upgrading still-shoddy infrastructure, trimming red tape, improving educational standards, territorial disputes with China and Pakistan, and Modi's creeping authoritarianism are key risks going forward. In 2021, services accounted for 57% of overall GDP, manufacturing 14%, other industrial activity 12%, and agriculture 17%. Looking at GDP by expenditure, private consumption accounted for 59% of GDP in 2021, government consumption 11%, fixed investment 31%, and net exports -1%.

In 2021, manufactured products made up 68% of total merchandise exports, mineral fuels 14%, food 11%, ores and metals 5% and agricultural raw materials 1%, with other categories accounting for 1% of the total. In the same period, manufactured products made up 48% of total merchandise imports, mineral fuels 30%, food 5%, ores and metals 5% and agricultural raw materials 2%, with other goods accounting for 10% of the total. Total exports were worth USD 438 billion in 2022, while total imports were USD 709 billion.

At the end, we find resurgence of India is going to happen in every aspect and the Mahabakya of Swami Vivekananda i.e., **India will shine all over the world**, is going to usher soon.

Goultam Multherjee

Dr. Goutam Mukherjee Hony. Editor, JILTA





ILTA for Green Technology







From the desk of General Secretary





The 22nd Sanjoy Sen Memorial Lecture was organized on Monday, the 15th January, 2024 (as 14th January being a Sunday) at 03.00 PM at the Seminar Hall – 19A, Science City, Kolkata.

The program resumed with the introductory speech from Mr. Susanta Mallick, General Secretary, ILTA who greeted all and requested the following to garland the portrait of late Sanjoy Sen.

- Mr. Arnab Jha, President, ILTA,
- Mr. Sivakumar T. D., Vice President, NaBFID, Mumbai and Speaker of the day,
- Miss Ruksar Bose, niece of Mrs. Ratna Sen,
- Mr. Swapan Kumar Basu, Senior Life Member, ILTA,
- Mr. Prabir Kr. Dasgupta, Senior Life Member, ILTA,
- Mr. Ashim Kr. Mitra, senior Life Member, ILTA
- Prof. (Dr.) Sanjoy Chakraborty, OIC, GCELT,
- Mr. Bibhas Chandra Jana, Joint Secretary, ILTA,
- Miss Himadri Tiwari, Award Winner from MIT, Muzaffarpur,
- Mr. Ramesh Ch. Sahoo, Campus in Charge, FDDI, Kolkata,
- Sk. Gholam Mohammad, from Industry

Mr. Mallick then requested the Speaker along with President, ILTA to take their seats on the dais and requested Mr. Asit

Baran Kanungo to honour Mr. Sivakumar T. D. with a flower bouquet and pshawl.

Mr. Mallick then invited Mr. Jha to deliver the Welcome Address to the gathering.

Mr. Jha welcomed all the dignitaries and participants from different sectors like Mr. Shivakumar, hon'ble speaker of the day, Mrs. Ratna Sen, wife of late Sanjoy Sen, Members of ILTA and other associations, organizations, academic institutions, industry etc. In his speech Mr. Jha elaborated the eventful life of Late Sanjoy Sen and his role as President of ILTA during 3 decades.

Mr. Jha also offered thanks to Mr. Shivakumar for choosing a serious contemporary topic as the subject of his lecture.

Mr. Mallick then declared the name of the following students who secured the topper position in B. Tech, Leather Technology examination from different institutes and awarded with Sanjoy Sen Memorial Medal:-

- a) Miss Himadri Tiwari from Muzaffarpur Institute of Technology, Muzaffarpur, Bihar in 2023 presented by Mr. Sivakumar T. D.
- b) Miss Anushka Pal from Harcourt Butler Technical University, Kanpur, U.P. in 2023 who could not able to attend the program due to her pre-occupancy

Prof. (Dr.) Sanjoy Chakraborty, OIC, GCELT, then announced the name of Miss Ayugma Sengupta who was to receive the Sanjoy Sen Gold Medal for topping B.Tech Leather Technology examination as Composite Topper of 4 years in 2022 from GCELT. But she also could not able to attend the program due to her pre-occupancy.

Prof. Chakraborty then declared the name of the students who were selected for receiving Dr. Prafulla Kumar Basu Memorial Scholarship and invited the following students to receive the same:



- a) Miss Sreeparna Sadhukhan (could not able to attend due to pre-occupancy).
- b) Mr. Saikat Kumar Maji presented by Mr. Arnab Jha.
- c) Miss Sunita Mondal presented by Mr. Sivakumar T. D.

On conclusion of the award presenting session, Mr. Mallick requested Prof. Chakraborty to introduce the Speaker Mr. Sivakumar T. D. to the gathering.

Mr. Mallick then offered thanks to Prof. Chakraborty and requested Mr. Sivakumar to deliver the 22nd Sanjoy Sen Memorial Lecture titled "*India in International Trade – Recent Trends and Possible Solutions*". The lecture which lasted for nearly an hour and was most informative and highly contemporary.

On conclusion of the lecture, Mr. Sivakumar was presented a memento and citation by Mr. Susanta Mallick.

Mr. Mallick then offered Vote of Thanks to all the dignitaries, award winners, guests and members present and the Science City authority for extending their useful support. He extended a most cordial invitation to all to participate in the 5th Prof. S. S. Dutta Memorial Lecture at Chennai on 1st February, 2024 during IILF-2024.

Mr. Mallick concluded with wishing all a happy, peaceful and prosperous New Year, 2024 and requesting them to help themselves to a high tea was being served at the outside of seminar hall.

More than 100 participants joined the program.

The whole program would be available on the YouTube Channel, Facebook Page and website of ILTA soon.

1st MOTIVATIONAL LECTURE AT GCELT, KOLKATA

The Executive Committee of ILTA sincerely felt that there is a need of organizing motivational lectures at various leather institutes for the students and junior technologists on a regular interval to educate and motivate them to be an entrepreneur in future.

On this perspective the above was organized jointly by ILTA and GCELT on Friday, the 19th January, 2024 in the Conference Room of GCELT, Kolkata at 02.30 PM.



The Executive Committee of ILTA sincerely felt that there is a need of organizing motivational lectures at various leather institutes for the students and junior technologists on a regular interval to educate and motivate them to be an entrepreneur in future.

On this perspective the above was organized jointly by ILTA and GCELT on Friday, the 19th January, 2024 in the Conference Room of GCELT, Kolkata at 02.30 PM.

The program resumed with the introductory speech by Mr. Susanta Mallick, General Secretary, ILTA who welcomed all the Dignitaries, Members of ILTA, Professors and students of GCELT.

Mr. Mallick then requested Prof. (Dr.) Sanjoy Chakraborty, OIC, GCELT, to say a few words and after that, Dr. Chakraborty greeted Mr. Aloke Sengupta, Director, M/s ASG Leather Pvt. Ltd., Kolkata, with a flower bouquet and requested Shri Arnab Bhuiyan, student, GCELT, to greet Mr. Tapan Nandi, Partner, Munai's Creation, ex-President, ILPA & ex-Chairman (East), CLE, with flower bouquet.

Mr. Mallick then requested Mr. Aloke Sengupta shared his views and experience on that day's topic *"Entrepreneurship Development"* from very beginning of his career. It was a very elaborative lecture which would definitely motivate the students to be entrepreneurs by growing in confidence and move forward. He also shared different aspects to be a good entrepreneur out of which his advice that *"To be a good entrepreneur, one must have to be a good human being"* was highly appreciated by the audience.

Thereafter, Mr. Tapan Nandi also shared his valuable experience on the said topic which would definitely help the students to



become a good entrepreneur by overcoming all the odds. He also mentioned that this type of motivational lecture should be organized by ILTA in collaboration with ILPA, CLRI also.

After the lectures a Q & A session was done where questions and quarries from GCELT students were clarified and suggested by the both speakers and other faculties of GCELT.

On conclusion, Prof. Chakraborty offered Vote of Thanks to the gathering and praised this initiative of ILTA which would definitely grow the confidence of not only the current entrepreneurs but also the pass out students to help grooming themselves to be a good entrepreneur.

Near about 100 participants joined this program.

5TH S. S. DUTTA MEMORIAL LECTURE



Above is scheduled to be held at the Seminar Hall – 'A' of Convention Center in Chennai Trade Center during IILF – 2024 from 10.00 am onwards.

Mr. M. Abdul Wahab, Managing Director, K. H. Exports India
Private Limited, has kindly consented to deliver the 5th Prof. S.
S. Dutta Memorial Lecture titled *"Global Leather Sector: Revolutionizing Sustainability, Circularity and way forward"*.

Also, Mr. Anto Alan PJ, Head, Business Banking, IDFC First Bank, has kindly consented to deliver a lecture titled *"Banking Options for Start Ups"*.

Formal Invitation has been forwarded to all through email on 20/01/2024.

13[™] MONI BANERJEE MEMORIAL LECTURE



This is scheduled to be held in mid of March, 2024. Details of the program will be intimated in due course.

14TH ASIA INTERNATIONAL CONFERENCE ON LEATHER SCIENCE & TECHNOLOGY (AICLST)

ILTA is on the way to organize the 14th Asia International Conference on Leather Science & Technology (AICLST) in the year 2026 at Kolkata, India as endorsed by the IULTCS Secretariat.

It is proposed that this would be organized during the Platinum Jubilee Celebration year of ILTA from August, 2025 to July, 2026, preferably nearer the time Chennai Trade Fair in February, 2026.

Planning & Details of the program would be shared in due course.

(Susanta Mallick) General Secretary







RECEIVING PRINTED COPY OF JILTA EVERY MONTH

We have started to post Printed copy of JILTA from April' 2022 to members and all concerned as it was before Covid period. Simultaneously we have been sending the e-copy of JILTA through email also to all the concerned receivers.

If you are not receiving JILTA by Post or through email, may please verify your Postal Address and/or Email Id with our office at the earliest.

PUBLISH YOUR TECHNICAL ARTICLE

Faculties, Research Scholars and students of various Leather Institutes may wish to publish their Research / Project papers in an Article form in this monthly technical journal, JILTA.

Interested author may sent their paper (in MS Word format) along with a PP Photograph and Contact details like Email, Mobile etc. to our email IDs : admin@iltaonleather.org / jiltaeditor@gmail.com

Members are requested to :-

- a) Kindly inform us your 'E-Mail ID', 'Mobile No', 'Land Line No', through E-Mail ID: admin@iltaonleather.org or over Telephone Nos. : <u>24413429 / 3459</u>. This will help us to communicate you directly without help of any outsiders like Postal Department / Courier etc.
- b) Kindly mention your **Membership No.** (If any) against your each and every communication, so that we can locate you easily in our record.

YOUTUBE CHANNEL & FACEBOOK PAGE OF ILTA

An official **YouTube Channel** namely **ILTA Online** and a **Face Book Page** namely **Indian Leather Technologists' Association** has been launched for sharing the activities of our Association since November' 2020 and July' 2021 respectively.

You may find all the Lives / Video recordings of different Seminar, Symposiums & Webinars on both of these social medias along with our website **www.iltaonleather.org** time to time.

You are requested to kindly do **Like** & **Subscribe** the YouTube Channel and ''**Follow**' the FaceBook Page to get regular updates on the activities of our Association.

General Secretary and the Members of the Executive Committee are available to interact with members at 18.30 hrs, at our Registered Office on every Thursday







ILTA News_____





Solidaridad Corner

Solidaridad

With over 50 years of experience in developing sustainable solutions to make communities more resilient, Solidaridad has been working on many different issues, from supporting marginalized communities to fostering a more sustainable supply chain.





Solidaridad Corner



www.iltaonleather.org JILTA

FEBRUARY, 2024 | 24



SOLIDARIDAD REGIONAL EXPERTISE CENTRE AND COUNCIL FOR LEATHER EXPORTS SIGN MOU FOR UPSKILLING INDIAN LEATHER SECTOR



Solidaridad Regional Expertise Centrefl(SREC) and theflCouncil for Leather Exportsfl(CLE) have forged a strategic partnership to further strengthen the performance of the Indianfleather industryflin domestic and international markets.

The Memorandum of Understanding (MoU), which was signed in Delhi today, will be effective from 1 January 2024 till 31 December 2028. "TheflMoUflinitiates a pivotal five-year partnership between SREC, a prominent not-for-profit organization established in the year 2008, and CLE, operating under the Ministry of Commerce and Industry, Government of India," a media release stated.

"Through joint efforts, Solidaridad and CLE aim to introduce comprehensive training programmes, facilitate access to cleaner technology, and promote certifications that enrich the skill set and knowledge base of those involved in theflieatherflindustry," said Solidaridad.

It added: "The MoU outlines the collaboration's commitment to train 150,000 workers over five years, conduct capacity-building programmes, and build partnerships with leading leather institutions and leather







businesses in the country. CLE will support trainings, workshops, engagement with stakeholders, and contribute towards the development and promotion of a Leather Portal for green and circular leather practices."

Sanjay Leekha, Chairman, CLE said: "The Council for Leather Exports has set an ambitious target of US\$ 47-billion business by 2030 for thefIIndianfIleather industry. This opens up avenues for leather professionals to innovate. I am happy to share that the MoU between CLE and Solidaridad is an alliance to represent a commitment to steering the Indian leather and footwear industry towards a more sustainable future. We are embarking on the journey of partnership, innovation and commitment to sustainability that will bring about transformative changes in the industry. Being responsible organizations, our endeavour would be to shape a sustainable future for this ever-evolving, labour-intensive manufacturing and exporting sector of India. Such an initiative also aligns very well with the 'Make in India' motto of the Government of India."

Monika Khanna, Country Manager, SREC said, "Together, we're not just aiming for efficiency and growth, but for a complete transformation – a transformation that prioritizes responsible production, empowers our workforce, and propels India's leather sector to a leadership position in global markets. Over the next five years, we will train 150,000 workers, build capacities, and foster partnerships that drive innovation and sustainability. This is more than just a collaboration; it's a catalyst for a greener, more equitable, and thriving future for Indian leather."R. Selvam (IAS), Executive Director, CLE highlighted the significance of this collaboration and said, "This collaboration will provide impetus to our joint vision of unlocking pathways to prosperity in the leather sector through the 7S strategy – sustainability, scale, skill, speed, supply chain, sales, and style." Tatheer Zaidi, Asia Head of Pollution Management in MSMEs at Solidaridad said, "The signing of the MoU signifies a dedicated commitment towards the holistic development and advancement of the leather sector, particularly focusing on empowering the tannery workforce through training and capacity-building initiatives."

This strategic partnership comes on the back of SREC's work in promoting sustainable practices in the Indian leather sector. The organization embarked on this journey in 2017 as an implementing partner for the 'Pollution Prevention and Efficient Water Use in Kanpur-Unnao Leather Cluster' project, funded by the Government of the Netherlands. SREC's groundbreaking efforts led to the introduction of cutting-edge technologies like water flow meters, solenoid valves, and Smart Water Saving System, effectively reducing water usage in tanneries.

(Source : businesstelegraph.co.uk – 26/12/2023)

Solidaridad







Exploring Leather Dying and Colouring Technics: Tradition, Innovation and Sustainability in the Leather Manufacturing Industry

(Concluding Part)

Dibyendu Bikash Datta

Dept. of Fashion Management Studies, National Institute of Fashion Technology, Kolkata

5.5. Ombre Dyeing is a technique that creates a gradual blending of two or more colours for a gradient effect. Various dye application methods can create the effect. The most common technique involves starting with light colour and gradually darkening it with additional layers of dye. Colours can be blended with brushes, sponges, or spray guns. This technique can be used with traditional and synthetic dyes on leather accessories like bags and belts [13].

- Gradient Effect: Ombre dyeing creates a gradient effect on the leather, where the colour gradually changes from light to dark or from one colour to another. The transition can be smooth and subtle or more dramatic, depending on the desired effect.
- Customization : Ombre dyeing allows for customization and unique design possibilities. By selecting different colours or shades, manufacturers can create personalized and eye-catching leather products. This technique offers versatility in creating various ombre effects, such as vertical, horizontal, or diagonal gradients.

5.6. Antiquing is a technique that involves distressing leather to give it an aged or vintage look. There are several ways to accomplish this, including dyeing the leather and then sanding or rubbing it to create a worn appearance [14]. Some popular antiquing methods include hand-rubbing, spraying, sponge or brush application. The choice of materials includes dyes, pigments, glazes, and finishes specifically formulated for antiquing effects.

Highlighting and Darkening : Antiquing involves highlighting certain areas and darkening others to create depth and visual interest. Highlighting is achieved by applying lighter shades of dyes or pigments to specific areas, such as edges, creases, or raised surfaces, to simulate wear. Darkening involves the application of darker dyes or pigments to recessed areas or overall surfaces to make them appear aged or weathered.

- Blending and Patina : Proper colour blending is vital in antiquing to achieve a natural and realistic appearance. Blending techniques like dry brushing or wet blending can be used to seamlessly blend different shades and create a smooth transition between colours. This helps in achieving an authentic patina, which is the natural colour change over time on leather.
- Laser Etching: Laser etching is a more modern technique that involves using lasers to etch designs or patterns into the surface of the leather. High-powered lasers are used to generate a focused beam of light that interacts with the surface of the leather, resulting in controlled ablation or removal of the material. This technique creates intricate designs and can be combined with dyeing techniques to produce unique and eye-catching leather products.
- Design Customization: Laser etching offers a high degree of design customization. Various software programs and computer-aided design tools are used to create or import digital designs or patterns. These designs can be manipulated, scaled, or modified to meet specific requirements, allowing for endless possibilities in leather decoration.
- Durability: Laser-etched designs on leather are highly durable and resistant to fading, peeling, or wearing off.







The laser removes a thin layer of the leather's surface, exposing the underlying layers that retain the design. This ensures that the etched pattern remains intact even with regular use and exposure to environmental factors.

5.7. Foiling is a technique that involves applying metallic foil to the surface of the leather to create a shiny, reflective finish. This technique can be used with a variety of colours and can add a touch of glamour to leather accessories like shoes and handbags [15].

- Foil Selection : Foils used in leather foiling are made of metallic or glossy materials, such as gold, silver, copper, or various vibrant colours. The foils come in rolls or sheets and are available in different finishes, including matte, glossy, holographic, or patterned.
- Adhesive Application : To achieve proper adhesion, a special adhesive or foil transfer layer is applied to the leather surface. The adhesive is typically heat-activated and designed to securely bond the foil to the leather.
- Foil Transfer: The foil is placed over the adhesive-coated leather, with the metallic or glossy side facing up. The foil is then pressed onto the leather using a heat press machine or a hot stamping tool. The heat and pressure cause the foil to adhere to the adhesive layer, allowing the metallic or glossy finish to transfer onto the leather surface.

5.8. Standards, Regulations, and Implications for Leather Manufacturers

There are several standards and regulations governing colourfastness testing in the leather industry, including those established by the International Organization for Standardization (ISO), the American Society for Testing and Materials (ASTM), and the European Committee for Standardization (CEN). These standards ensure that testing procedures are standardized and the results are reliable and reproducible.

Performing colourfastness tests on leather products is essential for manufacturers to ensure that the products comply with quality standards. Tests for colourfastness can help manufacturers identify potential problem early and make adjustments to ensure their products meet standards. Therefore, they can prevent costly recalls and protect their reputation.

6. Colourfastness and the Importance of Testing

Leather must be colourfast to ensure its colour does not fade over time. Colourfastness describes how well a material maintains its colour under various circumstances, such as light, water, and friction. Products without colourfastness can quickly lose their appeal and become unsellable [4]. The following are some reasons why leather products need to be colourfast:

- Maintaining Appearance : Colourfastness enhances the appearance of leather products. Leather is often used in high-end products, and maintaining the colour and quality of the material is essential for longevity. If the leather fades or loses colour quickly, it can significantly reduce the product's aesthetic appeal, making it look old and worn out.
- Durability: Colourfastness ensures that leather products are durable. Leather is a naturally durable material, and with proper care, it can last for years. Fading or losing colour quickly can weaken leather, making it more prone to cracking and tearing. It can result in a shorter lifespan and more frequent replacements.
- Protection Against Environmental Factors: Leather is often exposed to various environmental factors such as sunlight, water, and chemicals. Exposure to these factors can cause the leather to fade or lose its colour quickly. However, colourfast leather can withstand these environmental factors better, keeping its colour vibrant and durable.
- Customer Satisfaction: When customers purchase leather products, they expect the colour to remain vibrant and the product to be durable. Colourfastness is essential for ensuring customer satisfaction. Customer dissatisfaction can result if the colour fades quickly. It can result in negative reviews, decreased sales, and a tarnished reputation for the manufacturer.
- Cost-effectiveness: Excellent colourfastness ensures that the leather products are cost-effective. If leather fades or loses colour quickly, it can significantly reduce product lifespan. The result is more frequent replacements and higher costs for customers. The use of colourfast leather guarantees high-quality, durable products that last for years, which results in better customer satisfaction and lower replacement costs for manufacturers.





6.1. Factors Affecting Colourfastness

Several factors affect leather colourfastness, including light, water, heat, and friction. Exposure to UV light can result in fading, while exposure to water and heat can cause colour bleeding or transfer. Friction can fade or wear away colour over time. To maintain leather colourfastness and prolong the life of leather products, it's essential to take proper care and preventive measures. Here are some tips:

- Keep leather items out of direct sunlight and store them in a cool, dry place.
- Use leather-specific cleaning and conditioning products to maintain the leather's integrity.
- Avoid prolonged exposure to water and moisture. If the leather gets wet, allow it to dry naturally at room temperature.
- Protect leather items from excessive heat and humidity by storing them appropriately.
- Be cautious with chemical exposure, and always test any new cleaning or conditioning products on an inconspicuous area of the leather.
- Rotate the use of leather items to distribute wear and minimize friction in specific areas.

Precautions and practising good leather care ensure that leather items maintain their colour and appearance over time.

6.2. Testing Methods

The colourfastness of leather is determined using a variety of testing methods, including:

- Lightfastness Testing: This method involves exposing the leather to UV light for a specified period and then evaluating the colour change using a grayscale.
- Water Resistance Testing: This method involves immersing the leather in water for a specified period and then evaluating the colour change using a grayscale.

- Rubbing Resistance Testing : This method involves rubbing the leather with a standardized cloth or abrasive paper and evaluating the colour change using a grayscale.
- Perspiration Resistance Testing : This method involves exposing the leather to artificial perspiration for a specified period and then evaluating the colour change using a grayscale.
- Heat Resistance Testing: This method involves exposing the leather to high temperatures for a specified period and then evaluating the colour change using a grayscale.

7. Environmental Impact of Leather Dyeing

The environmental impact of leather dyeing processes is a matter of growing concern due to the chemicals and water usage involved [16]. Leather dyeing can have several adverse environmental effects, including:

- Chemicals Used in Leather Dyeing : Leather dyeing involves various chemicals, including chromium, heavy metals, and formaldehyde. These chemicals can harm the environment and human health, particularly if not disposed of properly. Chromium, for example, is a known carcinogen and can cause serious health problems if ingested or inhaled.
- Water Pollution: Leather dyeing can cause water pollution. Dyeing chemicals may enter the water supply and pollute nearby water bodies, such as rivers and streams. Aquatic life and ecosystems can be seriously affected by this pollution.
- Air Pollution : Leather dyeing can contribute to air pollution. The use of chemicals in the dyeing process can result in the emission of volatile organic compounds, which can contribute to smog and other air quality issues.
- Waste Generation : Leather dyeing can generate significant amounts of waste, including wastewater, solid waste, and hazardous waste. The disposal of this waste can be challenging and expensive, particularly if it contains dangerous chemicals.
- Sustainable Leather Dyeing: Several sustainable dyeing methods are being developed to reduce the environmental





impact of leather dyeing. These methods aim to reduce or eliminate harmful chemicals and minimize waste generation. For example, natural dyes made from plants, fruits, and other organic materials are alternatives to synthetic dyes.

- Closed-loop Systems : Wastewater from the dyeing process is treated and recycled back into the process, reducing water consumption and minimizing wastewater generation.
- Recycling and Upcycling : Leather scraps and waste can be recycled into new products or upcycled into new materials, reducing the need for virgin materials. Recycling and upcycling are becoming popular in the leather industry as a way to reduce waste.
- Government Regulations : Government regulations can reduce the environmental impact of leather dyeing. Regulations can limit chemicals and require sustainable practices. For example, the European Union has established the REACH regulation, which restricts the use of certain chemicals in leather production.

7.1. Water Usage and Management in Leather Dyeing

Water usage and management in leather dyeing are important to the leather production process. The leather industry is one of the most water-intensive industries, and the dyeing process is responsible for a significant portion of this water usage [16].

Water Usage in Leather Dyeing is a major concern due to its potential environmental impact. Leather dyeing requires a lot of water. Leather must be soaked in water to remove any impurities before dyeing begins. Once the leather is ready, it is dyed in large vats, which consumes considerable water. After dyeing, the leather must be rinsed to remove any excess dye, which requires significant water.

Using water management techniques reduces water usage and minimizes environmental impact. Despite diverse techniques, leather dyeing presents specific challenges. Water usage can be managed using several techniques. Many of these techniques require considerable investment, which makes them unaffordable.

- Closed-loop Systems are one of the most effective water management techniques used in leather dyeing. In a closed-loop system, water is treated and recycled back into the dyeing process, reducing the amount of water needed for the procedure. This system minimizes water usage and reduces the amount of wastewater generated.
- Reverse Osmosis is another water management technique used in leather dyeing. Reverse osmosis is a process that removes impurities from water, making it suitable for reuse in the dyeing process. This technique reduces the amount of water needed for the operation and minimizes the amount of wastewater generated.
- Chemical Reduction is a vital step toward improving environmental sustainability in the leather industry. Reducing the amount of chemicals used in dyeing can reduce water usage. The use of synthetic dyes requires more water than natural dyes. Water usage can be minimized by reducing the amount of synthetic dyes used in the process.
- Water Recycling is another technique used in leather dyeing to reduce water usage. The wastewater generated from the dyeing process can be treated and recycled back into the dyeing process, reducing the amount of freshwater needed for the procedure.
- Best Practices Adoption can reduce water usage in leather dyeing. For example, minimizing leather soaking water can decrease water usage. Similarly, using more efficient dyeing equipment can reduce water usage.

8. Energy Consumption in Leather Dyeing

A leather dyeing process requires heating, cooling, and agitation, which can consume significant energy. Energy management techniques are essential in leather dyeing to reduce energy usage and minimize the environmental impact [17]. Several techniques can be used to manage energy consumption in leather dyeing.

Energy Usage in Leather Dyeing requires a significant amount of energy. The process involves heating large vats of water to specific temperatures to facilitate dye absorption by the leather. The drying process requires energy to remove excess water from the leather.



- Heat Recovery is a technique used to reduce energy consumption in leather dyeing. In heat recovery, the heat generated during the dyeing process is captured and reused to heat the next batch of water, reducing the amount of energy needed to heat the water.
- Efficient Dyeing Equipment reduces energy consumption. The use of advanced equipment that heats water more efficiently can reduce the amount of energy needed to heat the water. More energy-efficient equipment can reduce energy consumption during drying.
- Natural Gas and Electricity used in leather dyeing can impact energy consumption. With more efficient burners and generators, energy consumption will be reduced.
- Best Practices adoption can reduce energy consumption in leather dyeing. For example, minimizing the amount of water used for soaking the leather can reduce the amount of energy needed to heat the water. Similarly, optimizing the dyeing process to minimize the amount of time the leather spends in the dyeing vat can reduce energy consumption.
- Challenges in Energy Management persist in leather dyeing, despite the different methods used. A significant challenge is the high cost of energy management techniques, which makes them inaccessible to small and medium-sized manufacturers.

9. Sustainable Leather Dyeing Alternatives

Sustainable leather dyeing alternatives are gaining popularity due to the increasing demand for environmentally friendly and socially responsible products. These alternatives use natural and biodegradable materials that are safe for the environment and human health [18].

- Natural Dyeing is a sustainable alternative to chemical dyeing. Natural dyes are derived from plants, minerals, and insects, and they are biodegradable, non-toxic, and renewable. Natural dyes produce unique and beautiful colours, unlike chemical dyes. The leather industry values the unique character created by these techniques.
- Bio-based Tanning is a sustainable alternative to traditional chrome tanning. It uses natural tannins derived

from plant materials like tree bark, leaves, and fruits to tan leather. Bio-based tanning is eco-friendly, produces highquality leather, and poses no health risks. Bio-based tanning requires less energy, water, and chemicals than chrome tanning.

- Laser Technology is a sustainable alternative to the traditional leather finishing process. Laser machines engrave, etch, and create designs on leather without chemicals or water.
- Waterless Dyeing is a sustainable alternative to traditional dyeing processes that require large amounts of water. It uses dry pigment and wax to colour leather without water. The process is eco-friendly, reduces water consumption, and produces high-quality leather.
- Upcycling and Recycling are sustainable alternatives to traditional leather production processes. Upcycling involves repurposing and transforming leather waste into new products, while recycling involves turning old leather products into new ones. These processes help reduce waste and minimize the environmental impact of leather production.

9.1. Regulations on Leather Dyeing and Colouring Techniques

Regulations on leather dyeing and colouring techniques are essential to ensure the safety of workers, consumers, and the environment. These regulations aim to control hazardous substance use, limit pollutant release, and promote sustainable production practices.

9.1.1. Regulatory Considerations for Leather Dyeing in India

Environment, health, and safety regulations govern leather dyeing in India. Unless properly managed, leather dyeing can have significant environmental and health impacts. Regulatory authorities and agencies that oversee environmental and safety compliance in India include the CPCB, State Pollution Control Boards (SPCBs), and the Ministry of Environment, Forest and Climate Change (MoEFCC). Leather dyeing operations must prioritize compliance and environmental sustainability to avoid fines, shutdowns, or legal action [19]. Here are some key regulatory aspects to consider:



- *Environmental Regulations* for leather industries in India mitigate the environmental impact of leather production and processing.
 - Water Pollution Control. Leather dyeing units must adhere to water pollution control regulations. They are typically required to treat their wastewater to remove contaminants before discharge into water bodies. Compliance with the standards set by the Central Pollution Control Board (CPCB) is mandatory. Leather dyeing units must comply with the Water (Prevention and Control of Pollution) Act, 1974.
 - Air Pollution Control: Emissions from dyeing processes should be within permissible limits. Leather dyeing units need pollution control equipment to mitigate air pollution and must comply with the Air (Prevention and Control of Pollution) Act, 1981.
 - Hazardous Waste Management. Proper disposal and management of hazardous waste generated during the dyeing process are regulated under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Leather dyeing units must follow guidelines for the safe disposal of hazardous waste materials.
- Chemical Safety and Toxicity: Leather dyeing units should ensure the safe handling, storage, and transportation of chemicals used in the dyeing process. Ensure compliance with the Chemicals (Management and Safety) Rules, 1989, and the Chemical Weapons Convention (CWC) if applicable. Safety Data Sheets (SDS) for chemicals must be available and accessible to workers. Leather dyeing chemicals may be toxic or harmful to human health. Regulatory bodies may restrict the use of specific chemicals.
- Occupational Health and Safety : Occupational Health and Safety (OHS), also known as Workplace Health and Safety (WHS) in some regions, is a multidisciplinary field focused on ensuring the well-being, safety, and health of workers in the workplace. The primary goal of OHS is to prevent work-related injuries, illnesses, and fatalities by implementing safety measures, policies, and practices.

Leather dyeing units must comply with the Factories Act, 1948, and other relevant labour laws. They must provide necessary facilities like ventilation, lighting, and protective equipment. Workers' safety is a regulatory requirement. Safety includes providing personal protective equipment, training on chemical handling, and emergency response procedures. Fire safety regulations must apply to flammable chemicals.

Chemical Management : Some chemicals used in leather dyeing may require registration with regulatory authorities, such as the Central Insecticides Board and Registration Committee (CIBRC) or the Registration Committee for Chemicals (RCC).

If leather products are intended for export, exporters should know the requirements of the Importer-Exporter Code (IEC) and other customs and trade-related regulations.

- Documentation and Record-Keeping : Leather dyeing units require 'Environmental Clearance' from relevant authorities. This involves submitting detailed project reports and complying with clearance conditions. Regulatory authorities require comprehensive records of chemical usage, waste disposal, emissions, and other relevant data.
- Compliance with International Standards : Leather dyeing units that export products must adhere to international standards and regulations, set by the EU's Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) regulation.
- Leather Industry Associations represent various stakeholders. The organization promotes a regulatory environment that balances the growth and sustainability of the leather dyeing sector in India. Businesses and consumers benefit from their collaborative efforts to ensure compliance with national and international standards.

9.1.2. European Union Regulations

European Union had regulations and standards in place related to the use of chemicals in leather dyeing and colouring techniques. These regulations were primarily aimed at ensuring



the safety of consumers, workers, and the environment [20]. Here is a general overview of the key aspects of EU regulations related to leather dyeing and colouring techniques:

- Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) regulation covers the production and use of hazardous chemicals in the leather industry in the EU. It requires manufacturers and importers to register chemicals used in leather dyeing, provide information on their properties and risks, and take necessary measures to protect human health and the environment. Chemicals that cause cancer, mutagenesis, or toxic effects are restricted by REACH.
- Classification, Labeling, and Packaging (CLP) regulation aligns with the classification and labelling of chemicals across the EU. Using standardized labelling and safety data sheets, it communicates the hazards associated with chemicals used in leather dyeing.
- Biocidal Products Regulation (BPR) regulates the use of biocidal products, including preservatives and antimicrobial agents used in leather dyeing. It requires authorization or registration of biocidal products before they can be placed on the market. The regulation ensures that these products are effective and safe for human health and the environment.
- European Chemicals Agency (ECHA) maintains a Candidate List of Substances of Very High Concern (SVHC). The list includes substances that may harm the environment or human health. Leather dyeing chemical manufacturers and importers must monitor the Candidate List and comply if any listed substances are present in their products.
- Good Manufacturing Practices (GMP) involve implementing procedures, controls, and measures to ensure product safety and quality. The EU promotes the use of GMP in leather dyeing processes. It includes proper handling, storage, and disposal of chemicals, as well as maintaining hygiene and safety standards in manufacturing facilities.
- Eco-labelling and Certification schemes for leather products that meet specific environmental and safety requirements are encouraged by the EU. These labels

assure consumers that the products are produced using environmentally responsible practices.

The EU has strict regulations concerning the use of certain chemicals in leather products that come into direct contact with the skin. For example, the use of azo dyes that release certain aromatic amines is restricted due to their potential health and environmental risks. The use of substances like chromium VI and formaldehyde at specific concentrations is restricted. These regulations aim to ensure consumers' safety and limit harmful substances in products.

9.1.3. United States Regulations

The use of different chemicals during leather processing produces wastes in solid, liquid, and gaseous form. Exposure to different chemicals is the main cause of soil pollution, atmospheric pollution, water pollution, and air pollution [21]. Here are some key regulations applicable to leather dyeing and colouring techniques in the US:

Environmental Protection Agency (EPA) regulations regulate various aspects of chemical use and environmental protection in the US. The EPA regulates chemicals harmful to health and the environment. The EPA regulates wastewater discharge, air emissions, hazardous waste management, and pollution prevention at leather dyeing facilities.

In addition to federal regulations, individual states and local jurisdictions may have specific regulations and requirements for chemical use and environmental protection. State and local regulations must be adhered to by leather dyeing facilities.

- Toxic Substances Control Act (TSCA) is the primary federal law regulating chemicals in the US. It provides the EPA with the authority to assess and regulate chemical manufacture, import, processing, distribution, and use. Leather dyeing chemicals manufacturers and importers must comply with TSCA requirements, including reporting obligations and restrictions on certain hazardous substances.
- Occupational Safety and Health Administration (OSHA) standards are for workplace safety, including regulations for handling chemicals and protecting workers from



exposure to hazardous substances. OSHA standards must be followed by manufacturers and facilities using leather dyeing and colouring techniques.

- Federal Hazardous Substances Act (FHSA) regulates the labelling and packaging of hazardous substances, including certain chemicals used in leather dyeing. Manufacturers and importers are required to properly label and provide appropriate warnings for hazardous substances, ensuring consumer safety.
- Consumer Product Safety Improvement Act (CPSIA) regulates the safety of consumer products, including leather goods. It sets limits on lead content and restricts the use of certain hazardous substances in children's products. Manufacturers and importers of leather goods must comply with CPSIA requirements to ensure product safety.
- Voluntary Standards and Certifications system exists in the US to ensure responsible and sustainable practices in the leather industry. For example, the Leather Working Group (LWG) offers a certification program to assess and promote environmental compliance and sustainability for leather manufacturers. The protocol covers various aspects of leather production, including chemical management, water management, and waste management.
 - Chemical Management prevents spills and accidents while reducing exposure to hazardous substances. It is important to handle, store, and dispose of chemicals safely. A safe work environment, safety procedures, and sufficient training are all required.
 - Water Management regulations limit pollution releases and promote sustainable water use. The effluent from leather production processes contains pollutants that are harmful to humans and the environment. Manufacturing regulations require the use of water treatment systems, monitoring effluent quality, and recycling water.
 - Waste Management regulations aim to reduce waste generation and promote sustainable disposal practices. Wastes from leather production include leather scraps, chemicals, and wastewater.

Manufacturers must develop waste reduction plans, recycle whenever possible, and dispose of waste responsibly.

10. Trends and Innovations in Leather Dyeing and Colouring

New trends and innovations emerge every year in dyeing and colouring leather. Here are some of the latest developments in leather dyeing and colouring:

- Sustainable Dyeing is a major trend in leather dyeing and colouring. Sustainable and eco-friendly practices are becoming increasingly popular. Natural dyes and reduced water usage are considered alternatives to traditional dyeing methods in tanneries.
- Digital Printing has revolutionized the leather industry by allowing more precise and detailed designs. This technology reduces water and chemicals use, making it more sustainable.
- Metallic Finishes are becoming increasingly popular in the fashion industry. Tanneries are now offering a wide range of metallic finishes, including silver, gold, and bronze.
- Neon Colours are a growing trend in leather dyeing and colouring. These bold, eye-catching colours are often used for fashion accessories, such as handbags and shoes.
- Multi-tone Dyeing creates a gradient effect on leather by using multiple colours. This technique adds depth and texture to leather and is often used in high-end fashion products.
- Water-based Dyes are a sustainable alternative to oil-based dyes. These dyes are less harmful to the environment and reduce waste produced during dyeing.
- Natural Dyes are biodegradable and contain no harmful chemicals, making them sustainable. Many tanneries explore natural dyes derived from plants and other natural sources.
- 3D Printing is an emerging technology in the leather dyeing industry. It allows the creation of intricate designs



and patterns on leather, resulting in unique and customizable products.

- Anti-microbial Finishes help prevent bacteria and other microorganisms from growing. With the increasing concern over hygiene and cleanliness, many tanneries are now offering anti-microbial finishes for their leather products.
- Customized Finishes are the prevalent trend in luxury leather fashion products. Many tanneries offer customized finishes for their leather products, allowing customers to create their unique designs and colour schemes.

11. Conclusion

Leather dyeing and colouring techniques are critical steps in the leather manufacturing process that can significantly impact the final product's quality and appearance. Various techniques developed over the years, ranging from traditional methods to modern techniques that utilize advanced technology for dyeing and colouring. The choice of technique depends on the desired final product and the leather type being used. Manufacturers must ensure that they use high-quality dyes to achieve consistent results and avoid the negative effects of low-quality materials. They must follow best practices and safety protocols to minimize the environmental impact of chemical processes and ensure worker safety.

In recent years, eco-friendly and sustainable leather dyeing and colouring techniques have grown. Manufacturers are exploring new methods that minimize waste, reduce toxic chemicals, and decrease energy consumption. Innovative approaches such as digital printing and laser engraving are gaining popularity, offering unique and customizable leather design options. Finally, it is essential to note that the leather industry is constantly evolving, and new dyeing and colouring techniques are developed regularly. Manufacturers must stay up-to-date with these advancements to remain competitive and provide customers with high-quality, innovative products.

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CLRI Corner

2023 Reflections & 2024 Resolutions













Biological Liquefaction and Anaerobic Digestion of Waste Fleshings Integrated with Sludge and Bio-Energy Generation – A Sustainable Development on Tannery Solid Waste



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1. INTRODUCTION

The safe disposal of large amount of solid wastes from tanneries such as unutilized lime fleshings, chrome tanning shavings, trimmings and sludge from effluent treatment plants are major challenges. The disposal of sludge in the Secure Land Fill (SLF) system is becoming prohibitive and environmentally challenges due to new regulations. The tanneries in India process $1.2 \rightarrow$ 1.5 million (i.e., $12 \rightarrow 15$ lakhs) tons of hides and skins per year and generate about $0.5 \rightarrow 0.6$ million (i.e., $5 \rightarrow 6$ lakhs) tons of solid waste and $0.4 \rightarrow 0.5$ million (i.e., $4 \rightarrow 5$ lakhs) tons/year of dewatered sludge from individual and Common Effluent Treatment Plants (CETPs).

The disposal of sludge and solid waste specifically waste limed fleshing are becoming a major environmental challenge. The tanneries processing raw hides and skins generate $10 \rightarrow 15\%$ of fleshing as wet solid waste. It is estimated annually on an $0.12 \rightarrow 0.15$ million (i.e., $1.20 \rightarrow 1.50$ lakhs) tons of wet fleshings are generated from Indian tanneries. The demand for conversion of fleshing into glue for wood works and other products are reducing due to the replacement by synthetic adhesives. New environmental pollution control norms such as reduction in volatile organic matter in the sludge to less than 5-10% for disposal from the current level of 20-25% with regard to the disposal into Secured Land Fill (SLF) and lack of capacity requirement for establishment of organized units for conversion into useful products, many small-scale unorganized units handling / processing waste fleshing vanished in many tannery clusters. Hence, it is becoming a necessary to develop and establish a viable environmental solution such as biological liquefaction, anaerobic digestion with bio-energy generation and bio-fertilizer to ensure safe disposal of waste fleshing and sludge.

2. METHODOLOGY OF BIOLOGICAL LIQUEFACTION

With a view to reduce the sludge generation from tannery effluent treatment plants and conversion into bio-energy and bio-fertilizer an anaerobic digestion system has been developed and applied on commercial scale under Indo-Dutch Technical Co-operation in the area of Environmental Protection to address the Leather industrial wastes. During the up-scaling of anaerobic digestion, an innovative development of biological liquefaction of waste fleshing by fermentation using part of bio-sludge from Anaerobic Digester was made and the liquefied fleshing successfully converted into bio-energy and bio-fertilizer. This innovation is separation of liquefaction process of the biomass mainly by enzymes and anaerobic digestion mainly by methane producing bacteria in different units. A part of active bio-mass from Anaerobic Digester is collected and slowly mixed with fleshing in serious of tanks for fermentation & liquefaction with a detention time of 7-10 days under atmosphere temperature of 18-35°C. The biologically liquefied fleshing becomes a fine slurry with high concentration of COD in the range of 20000 - 30000mg/l.

The addition of Fermented Supernatant / Bio-mass from Anaerobic Digester, collection of waste fleshing from tanneries, making into small pieces / mincing by mechanical and mixing of fermented supernatant and fleshing in tanks are the main physical activities. Maintenance of detention time of 7-10 days for biological liquefaction by gentle intermittent stirring, collection of liquefied fleshing at the





bottom of tanks and pumping the liquefied fleshing with high COD of 20000-30000 mg/l to the anaerobic reactor are shown in the following diagram.



Fig.1 : Biological Liquefaction of Fleshing

3. CHARACTERISTICS OF BIOLOGICALLY LIQUEFIED FLESHING AND FEED TO ANAEROBIC DIGESTOR

The liquefied fleshing is mixed with bio-sludge from effluent treatment plant with3-6% solids and fed to the Anaerobic Reactor with COD load of 1900-2600kg/day. The characteristics of feed to Anaerobic Reactor are given in the following table.

During Anaerobic Digestion process with detention time of 30 days about 0.5m3 of bio-gas is generated per kg of COD removal. The bio-gas is collected and stored in gas balloon and further converted into electricity using Gas Engine.

The anaerobic reactors are designed with detention time of about 30 - 40 days depending upon the feed temperature. The preferred temperature range is $25 - 35^{\circ}$ C. Suitable feeding and stirring mechanisms are provided in the anaerobic digestor. The bio-gas collected from the anaerobic digestor is stored in a glass balloon and fed to the gas engine for energy generation.

The digested sludge is dewatered to increase the solids concentration to the level of 20-25% and taken for biofertilizer plant by mixing with degradable organic solid wastes such as vegetable market waste, leaves, etc., and converted into bio-fertilizer.

SI. No.	Source of Feed	Volume m3/day	Solids Concentration	COD load in Kg
1.	From Biological Liquefaction System	5-10	3 – 5%	400-600
2.	Sludge from Primary & Secondary Clarifier of Soak Stream	20-25	4-5%	800-1000
3.	Sludge from Primary & Secondary Clarifier of Composite Stream	15-20	4-6%	700-1000
	Total feed / Rated capacity of Anaerobic Reactor	Upto 55	3.5 – 5%	1900-2600

Table 1 : Characteristics of Feed to Anaerobic Reactor/Digester

3.1 Performance of Anaerobic Digestor and Byproducts

The performance of the anaerobic digestor in terms of conversion of biologically liquified fleshing and sludge into bio-energy generation and further conversion of the digested sludge into compositing are given below:

- Conversion into Bio-gas : 0.5m³/ kg of COD removal.
- Bio-gas generation : 800 1200 m³/day Used as Fuel for Boiler & Electrical Energy.

- Digested bio-sludge is dewatered to increase solids concentration and conversion into Bio-fertilizer.
- Locally available solid wastes used for composting.

3.2 Bio-Fertilizer from Bio-Sludge and Degradable Solid Waste

The digested bio-sludge from Anaerobic Reactor is dewatered using Chamber Filter Press to increase the solids concentration to more than 20% and mixed with supplements such as



vegetable market wastes, leaves and other locally available degradable wastes. The mixing of bio-sludge and degradable solid waste would be in the ratio of 1:1 to 1.5 based on the volatile organic content. The detention period of compositing process would be in the range of 10-15 days under atmospheric temperature of 15-35°C. The process flow diagram of the compositing is given below:



Fig.2 : Bio-Fertilizer from Bio-Sludge and Degradable Solid Waste

On completion of the compositing process, the organic matter is subject to further sorting, pulverizing and natural drying. The dried bio-fertilizer is packed and taken for further use.

4. METHODOLOGY FOR REDUCTION OF VOLATILE ORGANIC MATTER IN SLUDGE

The conventional treatment system adopted by the tanneries in most of the countries are for the composited effluent starting from soaking to finishing operations. During the effluent treatment process large amount of sludge is generated from the Primary and Secondary Clarifiers. The sludge contains high amount of volatile organic matter in the range of 20-35% depending upon the type of process and quality of raw hides and skins. The disposal of hazardous category sludge from effluent treatment plants with high volatile organic matter into SLF causes problems in emission of methane and air pollution. Many SLF sites become an another source of pollution and require further remediation measures. Due to this, Environmental Protection authorities introduced new guidelines such as restriction in volatile organic content in the hazardous category sludge for disposal into the SLF.

For reducing the volatile organic matter to the permissible level in the dewatered sludge further addition of inorganic chemicals such as lime, sodium hydroxide, etc. are being added. This results in increase in volume of sludge and the cost of disposal into SLF is becoming costly. In view of this, the following alternative sustainable options were studied and started implementing in individual and Common Effluent Treatment Plants (CETPs) in India and other countries.

The sectional streams mainly soak liquor from the beam house operations prior to chrome tanning contain more percentage of volatile organic content due to the presence of dirt, dung, waste fleshing, etc. In the event of segregation and separate treatment, it is feasible to collect the sludge with high volatile organic matter from the Primary & Secondary Clarifiers and taken for anaerobic digestion. The anaerobic digester performance is improved due to exclusion of effluent from chrome and other chemical process which contains more nondegradable chemical components such as chromium, sulphonated components with low volatile organic matter. The volume of the chemical sludge generation is reduced by 50% and the disposal cost of the hazardous category sludge into the secured land fill is also reduced.

The improved effluent treatment system with anaerobic digestion of segregated sludge and solid waste in CETPs is shown below:



Fig.3 : Segregated Effluent Treatment with Anaerobic Digestion of Sludge & Solid Waste





5. FIELD IMPLEMENTATIONS

The pilot applied R & D units on solid waste management and bio-methanization have been implemented by CSIR-CLRI in cooperation with TNO-The Netherlands. A field demonstration unit had also been implemented by CLRI, Environment Technology Department in the CETP of CLC, Kolkata with financial support from DPIIT, Govt. of India.



Fig.4 : Co-Digestion of Tannery Solid Wastes for Bioenergy Generation



Fig.5 : Anaerobic Reactor for digestion of minced fleshing and sludge

Full-scale anaerobic digester system for biological liquefaction of fleshing with generation of bio-energy and bio-fertilizer have been proposed in the Mega Leather Complex (MLC), Kanpur based on the treatment process flow diagram shown in Fig.3.

6. IMPROVED AEROBIC BIOLOGICAL TREATMENT

It is becoming necessary to convert the chemical treatment to anaerobic / aerobic biological treatment to reduce the sludge generation and to achieve the required treatment standards. These are all the recent developments which are being applied in the upgradation and expansion of effluent treatment plants in India.

- Upgradation of equalization system into first-stage aerobic biological treatment with sulphide oxidation.
- Adoption of improved aeration system such as Jet Aspirator linked with integrated compressors for providing improved mixing, oxygen transfer upto 2.2 kg/kWh and odour control. An improved equalization cum sulphide oxidation system adopted in one of the CETPs is shown in the following figure.



Fig.6 : Improved Equalization-cum-Sulphide Oxidation System

7. PERFORMANCE EVALUATION

The rate of COD load, estimated bio-gas generation per day and the corresponding electricity generation in kWh/day in the proposed full-scale plant (Phase-1) in MLC, Kanpur are given in the following table.



Sludge dry weight in %	Degradable dry weight load in kg/day	COD load in kg/day	Biogas production in m³/day	Electricity generation in kWh/day
1.	1500	1500	450	945
2.	2000	2000	600	1260
3.	2500	2500	750	1575
4.	3000	3000	900	1890

 Table 2 : Bio-gas Production and Potential Electricity Generation from 50-55m³/day

- It is feasible to liquefy the waste fleshing biologically and increase the bio-mass feed to Anaerobic Reactor in terms of COD to more than 20000 mg/l.
- Optimum detention time for biological liquefaction is in the range of 7-10 days depending upon the fat content and atmospheric temperature.
- Optimum detention time for Anaerobic digestion is in the range of 25-30 days depending upon the COD load and atmospheric temperature.
- Bio-gas generation from anaerobic digestion is in the range of 0.4-0.6m3 per kg of COD removal.
- Improved occupational health and safety measures including COVID-19 pandemic situation had also been ensured in the design and development of biological liquefaction of degradable waste material and bio-energy generation system.

8. CONCLUSION

This unique and sustainable technological development of separate treatment of saline soak stream, biological liquefaction of fleshing, anaerobic digestion by mixing with degradable sludge from effluent treatment plant and solid wastes and conversion into bio-fertilizer and energy will reduce the volume of hazardous category sludge generation and minimize the disposal problem into SLF. The environmental issues in the disposal of unutilized fleshing and bio-sludge from effluent treatment plants are also minimized. Based on the pilot scale developments, commercial scale anaerobic digesters and advance oxidation system are planned to be implemented in Effluent Treatment Plants (ETPs) and CETPs in India and other countries.

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Products at a Glance - Wet End Chemicals

Products	PH	Solid%	Brief Description
A. Wetting, Degreasing	(action of the	22.00	
Agents, Dyeing Aids &			
1 SUDEDWET N	75.8	25	AREO & NREO Free Anionic Determent cum Wetting agent
I. SUPERWEI-N	1.3=0	20	APEO & NPEO Fee Annone Detergent cum Wetting agen
2. SUPERWET-OT	6.5 - 7.5	98	APEO & NPEO Free Powertul Anionic Wetting & Rewetting Agent
3. SUPERWET-3X	6.5 - 7.5	30	APEO & NPEO Free Anionic Wetting Agent
4. SUPERWET-100	7.0	100	APEO & NPEO Free Nonionic High Performance Wetting agent
5. SUPERWET-30	6.5	30	APEO & NPEO Free Wetting agent
6. PRODUCT-400	4 - 7.5	98	Humectant
7. DEGREASOL-13	7	98	Solvent Based Degreasing Agent
8 DEGREASOL-15	7-8	30	Solvent free degreasing agent
9 DVE EIX-GI	65		Cationic dve fixing agent
S. DIE FIX-GE	0.0	00	Caluart for increasing ach bills of Dura
IU. SUPERSOLVE-IG	-	90	Solvent for increasing solubility of Dyes
11. CHROMODISPERSE-HOW	7	98	Amphoteric chrome dispersing agent with softening properties
12. SUPER SOFTNER W	10-11	*****	Sequestering & chelating agent and water softner
13. SUPER SBS	9.5-10	96	Self Basifying Agent
B. PRESERVATIVES			
1. SUPER CIDE-BU 30	7	15	TCMTB Based preservative, free from phenol & chlorine
2 SUPER CIDE-BU 301	7	30	Highly effective TCMTB based preservative
3 SUPER CIDE-NP	7	40	PCMC Based Preservative
C SYNTANS		40	r onio cusco i loscituito
1. SUPER TAN AN	7-8	95	Pretanning Syntan
2. SUPER TAN HN	6.0	95	Chrome Syntan
3. SUPER TAN AL	3-4	95	Aluminum Syntan
4. SUPER TAN SKM	7.5	96	Neutralizing agent for all types of leathers
6. SUPER TAN WH	3.5-4	95	Synthetic Bleaching Syntan for white leather
7. SUPER TAN DLW	3-4	95	Synthetic Syntan Based on Phenol Carboxylic Acid Polymeric Condensate
8. SUPER TAN SB 6	7-8	95	Melamine and aliphatic nitrogen compound for re-tranning gives good fullness
9. SUPER TAN R 7	7-8	96	DCDA Based Synthetic Retanning Agent
11 SUPER TAN SRE	0.0 6.6	98	Anionic acodic retanning agent for chrome tanned leather
12. SUPER TAN 540	3.5-4.0	40	Low PH retaining agent for chrome tanned leather
13. SUPER TAN SAM	8.5	30	Styrene maleic polymer retanning Agent
14. UNIFIL B	7	95	Protein filler does selective filling of loose belly portions of leather
D. FAT LIQUORING OILS		1200	
1. LEATHEROL-VB-2	6.5-7.5	60	Vegetable based fatliquor anionic
2. LEATHEROL-VS-2	6.5-7.5	60	Semi Synthetic fattiquor anionic
4 LEATHEROL -F SPI	8.5-7.5	70	Sulphited Fish oil based fatiguor
5. LEATHEROL-SI	6.5.7.5	90	Sulphited Fish oil based fatliquor
6. LEATHEROL - FE	7.8	50	Economical fish oil based faliquor
7. LEATHEROL-LS	7.8	50	Lanolin based fatliquor
8. LEATHEROL-LPS-2	7.8	35	Lecithin based fatliquor
9.LEATHEROL-S	7-7.5	60	Synthetic neatsfoot oil based fatliquor
10. LEATHEROL-SA	7-75	80	Synthetic Sperm oil based fatliquor





11. LEATHEROL-ASN	6-7	70	Light Fast Anionic Synthetic Fatliquor based
12. LEATHEROL-SAN	6-7	50	on aliphatic Hydrocarbons
13. LEATHEROL-SR	77.5	60	Light Fast Synthetic Fatliquor based on Sulphited
14- LEATHEROL - SRS	77.5	55	Synthetic Easter Suitable for upholstry, Gloving.
			Gives Highly Soft Leather without looseness
15. LEATHEROL-SF	6.5-7	50	Anionic Synthetic Fatliquor based on paraffin wax and mineral oil
16. LEATHEROL-WSM	7.5-8.5	60	Highly penetrative Synthetic Fatliquor gives dry fee
17. LEATHEROL-SK	6.5	98	Synthetic substitute for raw neats foot oil
18. LEATHEROL-DSN	6.5		Synthetic Polymeric Fatiquor for high quality soft leather
19. LEATHERSOFT-GSH	3.5-4.5	20	Cationic fatliquor.

Products at a Glance - Finishing Chemicals

Products	PH	Solid%	Brief Description
A-PROTEIN BINDERS	1	14.5	Contraction of the second
1- SUPER BINDER P	8.5	18	Med-Soft protein binder for all type of leather
2- SUPER BINDER H	8.5	16	Hard Binder for topcoats to produce bright, transparent & filled surface reacts well with formaldehyde & improves acetone resistance.
3- SUPER - GLAZE	8.5	20	Med-Soft protein binder mainly used for polishing & glazing finishes
4- SUPER GLAZE A	8.5	18	Mainly used in the glazed & polishing finishes. It forms a clear, high gloss & an elastic film, Good on corrected grain leather for glazing
5- SUPER TOP C	8.5	20	Med-Hard protein binder to give glossy transparent film.
B- SPECIALITY RANGE FOR GLAZE FINISHES		12	Mainly used as a plate releasing binder.
1- SUPER GLAZE TOP 16	8.5	16	Hard top fixing agent for glazed finishes. It reacts well with heat so that glaze develops fully to give high gloss & outstanding handle.
2- SUPER GLAZE BP 16	8.5	10	Suitable for glazed & polished finishes. It has excellent glazing properties. Produces a well sealed surface & the break remains elegant.
3- SUPER MATT HG	8.5	20	An especially malt protein binder for finishing for snuff/full grain burnish leather for upgradation & touch
C- COMPOND BINDERS			and the second second second
1- SUPER COMPOUND 28E	7.5	32	Specifically developed blend of Wax Acrylic & Fillers to produce leather with high investigas & smooth tae). Print relevition properties are excellent.
2- SUPER COMPOUND 80	7.5	35	Specifically developed blend of PU. Acrylic & Fillers to produce leather with biotycoverage & smooth feel. Print retention properties are excellent
3- SUPER COMPOUND 11	7.5	25	Soft, Flexible anionic compound with slight tackiness. Mainly used in the finishing of parment nappa, shoe nappa etc.
4- SUPER COMPOUND 95	7.5	35	It is used in the sealing coat to conceal the grain defects, mainly
5- SUPER COMPOUND MS 36	7.5	30	Soft, Flexible anionic compact with low tackiness. It can be used as a note tratestion & surface brief up
6- SUPER BASE S	8.5	10	Soft Alphatic PU having the particle size mainly used for polishing ground where excellent clocks of the crain in the size without invasion otherize of the is becaused too
7- SUPER BASE S - 2	8.5	16	Soft Compact mainly used for Polishing Ground.
8- SUPER COMPOUND ST -44	7.0	30	Soft flexible anionic compact with very low tack suitable in
9- SUPER COMPOUND APF - 38	7.5	28	Compound for spit upholsery, it provides good covering & softness maintaining the natural feel of the leafter with excellent embousing properties.
10- SUPER BINDER SD	7.5	32	Compact Binder with a very pronounced filling effect on full-grain Leadher & on Splits. Very high fastness & easy to use. Especially recommended for full grain shoe upper leather.



Sterling Corner_____

Products	PH	Solid%	Brief Description
D-ACRYLIC BINDERS			The are walk to
(i) SOFT ACRALIC BINDER		-	Call Eng Circle Distancement in the distance for the animal support in the
I- SUPER DINDER S	4,0	30	improves adhesion without overloading the grain.
2- SUPER BINDER SF	7.0	38	Self-Crosslinking binder used for general plated resin finishes. It has excellent surface build up & surface amoothness.
3- SUPER BINDER ST - 40 - S	7.0	35	Soft, binder with fine particle size used for sealing coat for finishing splits.
4- SUPER BINDER MV	7.0	25	Soft micro fine binder that produces a fine transparent film. In
5- SUPER BINDER APC - 2000	7.0	35	Self-Crosslinking general - purpose med-soft used as a major binder for
(ii) HARD ACRALIC BINDERS	1		bottom as well as for intermediate coats. It has moderate surface build up.
1- SUPER HTB -5	5.5	35	Generally used as a topcoat for resin as well as for glazed finishes. It producess a bright, lustrous & a radiant gloss with a pleasant touch. It can be used as an intermediate binder for plate release.
2- SUPER BINDER AP - 40 S	7.0	38	Mod-Soft Soft-Crosslinking binder used for general resin finishing. It has excellent surface build up & smoothness.
(III) MIDIUM SOFT ACRALIC BINDERS	1	1.1.1	
1- SUPER BINDER SM	7.0	38	Self-Crosslinking binder used for general plated resin finishes.
2- SUPER BINDER MS	7.0	38	is has excellent surface build up a surface smoothness. Self-Crossifinking binder used for general plated resin finishes.
3- SUPER BINDER WE-40-C	7.0	38	Med-Soft Self-Crosslinking binder used for general resin finishing. It has excellent surface build & Smoothness. Particularly suitable
4- SUPER BINDER APC - 8000	7.0	35	for finishing of waterproof leather. Med- Soft binder with excellent coverage good adhesion & excellent fastnoss properties, generally used for plated resin finishes with excellent
5- SUPER BINDER IF	7.5	37	plate & print release properties. Finely divided, flexible and Water resistant. Used in impregnation in adhesion coals and in planmatical coals.
(iv) IMPREGNATING BINDERS	- 1		
1- SUPER BINDER G-1	8.5	16	It is an impregnating binder in the solution form. Provides good buffing properties, scuff resistance & ensures a tight grain.
2- SUPER BINDER G-2	8.5	15	It is softer than SUPER BINDER G-I & can be blended in any proportion to achieve the desired softness.
E- FEEL MODIFIER		10000	BURNERS MARCHART MAR
1- SUPER SLIP G	7	20	Silicon oil, solvent soluble touch modifier based on modified silicone oil it gives slippery feel & contributor notably to the resistance to rubbing.
2- SUPER FEEL SB	7	50	Solvent soluble silicone based touch modifier that can be mixed with lacquer or sprayed alone to get slippery touch along with the candle fee
3- SUPER SB - 50 E	6.5	25	Emulsified version of SUPER FEEL S8 - 50
4- SUPER FINISH SB - 600	7	10	Poly-silicone based feel modifier that can be diluted in solvent as well as in water media, it gives warm waxy & slippery feel
5- SUPER SLIP - 40	7	5	Silicone based emulsion water repellant, conditioner and natural feel improver.
F- TOP COATS NITROCELLULOSE BASED (i) SOLVENT SOLUBLE		1.3	
1- SUPER LAC S	6.5-7	28	High gloss nitro-cellulose lacquer solvent soluble with good handle & excellent fastness proverties
2- SUPER LAC S MATT	6.5-7	24	Matt nitro-cellulose lacquer solvent soluble with good handle & excellent fastness properties.
3- SUPER LAC IM	6.5-7	32	High solid sclvont based lacquer with very high gloss good handle & excellent fastness properties.



= Sterling Corner_____

Products	PH	Solid%	Brief Description
(II) WATER SOLUBLE		12 14 14	
1- SUPER LAC WS	7	26	High gloss nitro-cellulose lacquer water and solvent soluble it provides
2- SUPER LAC WS MATT (iii) TOP COAT EMULSIONS	7	22	Matt nitro-cellulose lacquer water and solvent soluble it provides silky gloss & produces soft & supple handle.
1- SUPER FINISH CHN	7	18	Med-Soft high gloss final fixing agent with excellent fastness properties & touch it can be ambressed & dour downward
2- SUPER FINISH SK -15	7	15	Med-Gloss Med Hard intermediate of final fixing agent with excellent
3- SUPER FINISH SK -16	7	18	fastness & good handle It is a med-gloss, soft final fixing agent. Particularly suitable for garment leather where good touch & fine handle is required.
4- SUPER FINISH SK - 18	7	16	It is a med-hard, matt intermediate or final fixing agont. It has excellent fastness properties & produces a good handle.
5- SUPER FINISH BLACK CHN	7	18	It is the dyed version of SUPERFINISH CHN
6- SUPER FINISH SK -20	7	16	It is a med-hard intormediate or final fixing agent, particularly suitable as plate release lacquer for upholistery leather
7- SUPER FINISH SK - 25	7	18	It is high performance top coat NC lacquer Emulsion with excellent fastness properties & touch it can be embossed & dry drummed.
G- FINISHING AUXILIARIES		145	
(I) SUPER WAX W	8.5	13	General - purpose base cost was used to reduce the stickiness of the base cost & to impart soft handle to the leather.
(ii) SUPER PENETO I	7	98	Penetrator based on solvents & additives.
H- AUXILIARIES FOR PULL-UP EFFECT	1		
1-SUPER OP - 2	7	100	Special oil for oily pull up article. It possesses excellent penetrating power & confers strong darkening with pronounced pull up effect.
2- SUPER OP -18	7	100	Gives excellent pull up effect to the leather. Can be roll coated does not harden the prain does not impair the adhesion of the subsequent finishes.
3- SUPER OP 12	7	100	It is especially suited for oily pull up article where groasy & waxy feel is required.
4- SUPER OP -66	7	100	Fluid Oil used in finishing oily pull up articles. It can also be used in finishing of water good leaflagt
I - TOUCH AGENT	1.1.5		and a get the poor starts.
1- SUPER - 185	7	100	Fluid oil generally use for finishing of oily pull up articles where outstanding touch in required.
J - WATER BASED EMULSION FOR PULLUP AND CRUNCH EFFECT			
1- SUPER OPW - 7	8.5	22	Water dilutable oil mainly used for base coat application for pull-up articles.
2- SUPER OPW -10	8.5	27	gives excellent pull up effect to the leather. Can be roll coaled does not harder the grain's does not impair the adhesion of the subsequent finishes.
3- SUPER OPW - 57	7.5	30	It is a emulalifable oil that produces article having strong Pull up. It has a very good
4- SUPER OPW - 240	8.5	50	touch. It is generally used for the article for Light to Medium Pull effect. It has very fine
K- HARD WAXES			tonus and poet you wamper the laguetator of the appendition coart
1- SUPER WAX 70	7	100	Off while hard wax for oil pull up effect
2- SUPER C WAX	7	100	Pale yellow hard wax for pronounced oil pull up effect
L- SUPER AN PIGMENTS M- SUPER AN PIGMENTS CF N- SUPER CAT PIGMENTS O- SUPER ALENE	7-8 7-8 5-5.5 7		Anionic pigments with casein Anionic casein free pigments Cationic Pigment Anionic Dye solution
P- SUPER CATALENE Q- SUPERSOLVE-HA	5 7	100	Cationic Dye solution Water soluble, slow drying solvent for lacquers, dye solutions in pure aniline finish, all so used as penitrator



IULTCS Corner=



INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES (www.iultcs.org)

Sent on behalf of the Vice Chancellor of the University of Northampton, Professor Anne-Marie Kilday



Dear Michael,

Since September the University has conducted a consultation about the viability of leather education and research, in the context of a severe decline in home and international student demand for this subject, economic downturn, and rising energy prices.

Leather education has been cross subsidised for several years, to allow the Institute for Creative Leather Technologies (ICLT) at the Waterside campus to continue its research and teach courses and professional qualifications in leathercraft.

However, an extensive review with internal consultation and input from external stakeholders has led to the conclusion that this area cannot attract sufficient income to enable the University to continue to support it and with regret the decision has been made to close the subject area.

Teaching delivery will terminate after the 2024/25 academic year with the implementation of a Student Protection Plan to ensure those already enrolled can complete their studies, and the University is in discussion with those whose job roles will be affected.

To reiterate the environment under which this decision has been necessary, the number of UK leather producers has been in decline, and the largest producers are now China, Brazil, Russia, India and Italy. This has severely impacted the number of domestic students, and has not delivered commensurate international students.

In recent years, recruitment has also been heavily impacted by Brexit and the loss of a regular flow of students from Italy.

There are strong and long-lasting associations between Northampton and leathercraft, and our research is world-leading. However, the costs of teaching declining student numbers can no longer justify cross-subsidy from other areas of the University, especially at a time that the whole sector is struggling financially.

Fashion and footwear courses at UON will remain and adapt to any changes in leather provision, and the students currently enrolled on courses specific to leathercraft will be able to complete their studies.



IULTCS Corner _____



INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES (WWW.iultcs.org)

I received a great deal of correspondence on this issue, and I understand many people will – like me - view this decision with regret. Unfortunately, it remains necessary. If you would like to discuss this with me further, please do not hesitate to get in touch.

Kind Regards,

Anne - Marie Kilday.

Professor Anne-Marie Kilday Vice Chancellor

(Source : Email from Julian Osgood - 08/01/2024)

Message from the President and Officers January 2024

Dear IULTCS Members and Associates,

126 years of cooperation and exchange of knowledge for the development of the tanning industry are supporting the fundamental principles of the IULTCS. The Officers of the Union for the period 2024-2025 are proud of this fruitful history that has undoubtedly helped the generation of modern technologies of the leather manufacturing and the development of chemical, physical and fatness test methods. The capabilities of the Union have been always aligned with the high demands on leather quality requirements and within the frame of sustainable and environmentally friendly processes. Leather is made by nature and its incomparable structure of collagen fibers conferring exceptional properties cannot be replicated.

With the focus on the XXXVIII IULTCS Congress to be held in September 2025 in Lyon, France, the purposes of the Union for the next two years are :

- Statues and Internal Regulations review and update: ensuring that the governing documents align with the need of the Union.
- Empowering the role of the IULTCS Commissions: to boost the effectiveness of our existing commissions and to explore the establishment of a new commission for sustainability to address the emerging challenges and to drive positive change within the industry :
 - **Communicating leather as an irreplaceable material:** pushing back against the falsehoods widely shared on social media, with facts and scientific arguments.







INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES (WWW.iultcs.org)

- Global collaboration for Research and Innovation between international research institutions and industry partners to promote continuous innovation in leather technology and measurable impact in processing.
- Education and skill development within the leather sector. Support programs that enhance the knowledge and capabilities of professionals, ensuring a skilled workforce for the future.
- Youth Engagement and Mentorship: cultivating the next generation of leather scientists and professionals by promoting youth engagement initiatives such as the YLSG. Collaboration between our experienced members and the emerging talent to ensure as seamless a transfer of knowledge as possible.
- Environmental stewardship and responsible practices along the leather value chain.

The accomplishment of these commitments could not be possible without the excellent work and dedication our the past IULTCS President, Mr. Jean-Pierre Gualino, during the last two years. The Union recognizes and appreciates his exemplar contribution, that will continue with his support for the organization of the Congress in Lyon.

We take this opportunity to wish all the members of the Leather Chemists and Technologists Associations around the world, a very Happy, Peacefull and Successful 2024!

The IULTCS Officers:

Dr. Joan Carles Castell – President Geoff Holmes – Vice President Mr. Jean-Pierre Gualino – Past President Dr. Luis Zugno – Secretary and Past President



INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES



Dichromate Reduction Without "Reducing Agent"

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Dept. of Leather Technology, Govt. College of Engineering & Leather Technology, Kolkata

Abstract

The chrome-tanning process currently dominates the global leather production industry, accounting for over 90% of the 18 billion square feet produced annually [1]. Chromium salts, particularly Basic Chromium Sulfate (BCS), are extensively utilized as tanning materials due to their desirable attributes, including excellent mechanical resistance, superior dyeing suitability, and improved hydrothermal resistance to the leather by cross linking with the collagen fibers compared to hides treated with vegetable tanning agents.

Chromium tanned leather can contain between 4 and 5% of chromium, which is tightly bound to the protein [2]. Although the form of chromium used for tanning is not the toxic or carcinogenic hexavalent type, there remains interest in chrome management in the tanning industry such as chrome recovery and reuse, direct/indirect recycling, use of low chrome or "chrome-less" tanned leathers are practiced to better manage chromium in tannery.

The disposal of chromium-contaminated sludge, an inevitable by-product of the chrome-tanning process, poses a significant environmental challenge for the leather production industry. Addressing this issue requires the development and implementation of sustainable alternatives that minimize the accumulation of chromium salts in wastewater treatment processes.

Key Words: Green Technology, Chromic Chloride (CrCl₃), Waterless Tanning, Maximum Uptake.

1. Introduction

The leather industry currently relies heavily on the chrometanning process, which accounts for a substantial portion of global leather production. This method employs chromium salts, particularly BCS, due to their favorable properties such as enhanced mechanical strength, exceptional dye absorption capabilities, and superior resistance to hydrothermal conditions. Regrettably, a significant portion of the chromium salts used during tanning reacts with the skins, while the remainder accumulates in the tanning exhaust bath. As a result, the subsequent treatment of wastewater produces sludge containing chromium salts. This disposal issue presents an evolving environmental difficulty that requires urgent attention in the tanning industry. However, a significant drawback is that approximately 70% of the chromium salts used for tanning react with the skins [3], while the remaining salts accumulate in the tanning exhaust bath and eventually find their way into sludge during wastewater treatment. Consequently, the proper disposal of chromium-contaminated sludge has emerged as a critical environmental challenge in the tanning industry.

Tannery effluent ranks as the most significant pollutants among various industrial wastes, primarily due to their substantial contribution to chromium pollution. In India alone, tannery industries discharge approximately 2000–3000 tons of chromium into the environment each year, with chromium concentrations in aqueous effluents ranging between 2000 and 5000 mg/l. This far exceeds the recommended permissible discharge limits of 2 mg/l [4].

Alternatively, when chromium is used for tanning without proper operation, there is a potential risk associated with toxicity linked to hexavalent chrome. Given that leather is incorporated into numerous consumer goods and the unfortunate generation of by-products and waste during the leather manufacturing process, it becomes imperative for the leather industry to effectively manage and exert complete control over this potential risk. To meet present sustainability standards, it is essential to guarantee 100% safety for tannery

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workers, the environment, and the end users of leather products.

Minimum effluent or discharge idea, in belief, should reduce the pollution load in tanning industry totally. Impending the discharge toward zero value is a rational as well as a global challenge. The various alternative approaches have been discussed elsewhere [2]. Development of an eco-benign process requires commercial viability apart from achieving the required product quality. The zero discharge approach would lead to several direct and indirect benefits such as reductions in the use of chemicals, water, energy, and effluent treatment cost [5].Conventional leather processing involves a number of processes and operations.

Tanning hide into leather involves a process which permanently alters the protein structure of skin, making it more durable and less susceptible to decomposition, and also possibly coloring it.

Chrome Tanning is the most popular form of leather tanning worldwide[6].

Sodium dichromate or potassium dichromate has a historical use in tanning industry since the beginning of chrome tanning era. Initially it started usage with double bath chrome tanning process where dichromate is used in an acidic bath with hydrochloric acid. This double bath process is now of historical interest in view of the carcinogenic property of dichromate or chromium (VI).

Since the last few decades of the previous millennium the Tannery reduced Chrome liquor with Molasses has made the inception of single bath chrome tanning process this is further altered with the commercial production of Sulfur dioxide reduced basic chromium sulfate (BCS powder). It has become a monopoly of BCS powder in its global usage for the production of chrome tanned leather which is a very simple and reliable method.

From the fundamental of inorganic chemistry, it is well known that concentrated hydrochloric acid has got a different chemistry from the formal solutions of hydrochloric acid. Concentrated hydrochloric acid is available in the laboratory is mostly 33% pure (W/W, weight by weight). Concentrated hydrochloric acid can act as a REDOX reagent which the formal dilute solutions of hydrochloric acid do not. In our work the dichromate(Na or K) is treated with concentrated hydrochloric acid in a water bath and heated to dryness in different ratio. The dry mass is diluted with distilled water to make different standard solutions. Interestingly during the treatment in water bath, the color transparently changes to a greenish mass. Color change of dichromate from orange to green is a clear indication of the reduction of chrome (VI) to chrome (III). The reaction may be viewed as equation (i)

$$Na_2Cr_2O_7 + 14HCl \xrightarrow{t^0C} 2CrCl_3 + 2KCl + 3Cl_2 + 7H_2O \quad (i)$$

This reaction shows the dichromate is being reduced by concentrated hydrochloric acid and it produced hydrated chromic chloride.

But the same hydrochloric acid in dilute condition does not change the color of dichromate. This fact is taken care of in the double bath chrome tanning process.

Water plays a crucial role in facilitating the hydrolysis, polymerization, and olation of chromium molecules, as well as in the formation of different oligomeric species. However, the conventional chrome tanning process suffers from inadequate absorption of chromium in the hide and skin matrix, leading to a significant amount of chromium molecules remaining in the discharged water effluent. This substantial effluent poses a major problem in the leather industry, as it contains potentially toxic chromium molecules. In order to address this issue, numerous scientists have introduced various chromium management technologies. Some recent advancements in this field include chrome recovery and reuse, direct recycling of chrome liquor, high exhaust chrome tanning and tanning salts, closed-loop aluminum-chrome combination tanning, picklebasification-free chrome tanning, and two-stage tanning.

It is believed that sodium or potassium dichromate reacts with HCl or H_2SO_4 and produces chromic acid which is described as popular double bath chrome tanning process. Chromic acid reduces in 2^{nd} bath with the help of thiosulphate or hypo in presence of HCl and produces BCS.

Besides a new resultant can also be attained if sodium or potassium dichromate reacts with strong (LR Grade)Conc. HCl, then $CrCl_3$, $6H_2O$ can be obtained from this reaction which may be explored for tanning potency.

Chromium, an abundant and relatively cheap transition metal, atomic no. 24, which places it in the VIA group, is widely explored in many industrial applications as well as essential nutritional



requirement including leather industry [7].The relative kinetic inertness of chromium has been reviewed extensively, with wealth of data on their exceptional activity as transition metal photo reactive element. There are two stable oxidation states i.e., Cr(III) and Cr(VI) among several oxidation states (II, III, IV, V and VI). Although Cr (VI) exerts many hazardous effects in humans, trivalent chromium has been enlisted as an essential element for various industrial applications including leather industry.

Chrome tanning is one of the prerequisite to obtain light, inexpensive leathers of high thermal and bacterial resistance. Pickling, an usual procedure for adjusting the solution pH of about 2.5 is required to penetrate Cr³⁺ salts into the hide and skin. This is essential for cross linking of collagen and chromium complexes. Sulphuric acid is used for pickling whereas BCS is used as a tanning material.

Based on this notion, replacement of BCS with reaction mixture of Hydrochloric acid and Potassium dichromate $(K_2Cr_2O_7)$ was

attempted in chrome tanning. This will eliminate pickling procedure, resulting minimization of water usage, chrome recovery and rechroming. This might be a direction towards cleaner leather processing.

2. Experimental Procedure

2.1. Materials.

All the reagents and solvents were of analytical grade. Potassium dichromate $(K_2Cr_2O_7)$ was purchased from Sigma. Technical-grade hydrochloric acid was procured from SRL.

Reduction

In a 50mL beaker equipped with electromagnetic stirrer and a thermometer, solid sodium dichromate $(Na_2Cr_2O_7)$ 1g and Conc. Hydrochloric acid was added into it and stirred up to complete dissolution. The content was heated in water bath at 100°C. The color of solution was changed to dark green.

Sample No	Potassium Dichromate	HCI (in ml)	Colour of the solution	UV VIZ result (Cr-VI)	
1	1 gm	1	Deep Pink	Cr -VI present	
2	1 gm	3	Deep Pink	Cr -VI present	
3	1 gm	5	Deep Pink	Cr -VI present	
4	1 gm	7	Deep Pink	Cr -VI present	
5	1 gm	8	Deep Pink	Cr -VI present	
6	1 gm	9	Deep Pink	Cr -VI present	
7	1 gm	10	Deep Pink	Cr -VI present	
8	1 gm	11	Light brown	0.0061 mg/lit Below detection level (BDL)	
9	1 gm	12	Light brown	0.0098 mg/lit (BDL)	
10	1 gm	13	Light brown	0.0053 mg/lit (BDL)	
11	1 gm	14	Light brown	0.0071 mg/lit (BDL)	

Table -1 (Test Without dilution)

Table -2 (Test With dilution)

Sample no	Potassium dichromate	Potassium HCI dichromate		Result	
1.	1.0 gm	3.0 ml	9.0 ml	Cr -VI present	
2.	1.0 gm	6.0 ml	6.0 ml	Cr -VI present	
3.	1.0 gm	9.0 ml	3.0 ml	No Cr (VI)	
4.	1.0 gm	12.0 ml	0	No Cr (VI)	





(Picture -1)

3. Results and discussion

The resulting aqueous solution of potassium dichromate $(K_2Cr_2O_7)$ is orange. The dichromate ion in aqueous solution is in equilibrium with the chromate ion, and this can be shown with the following equation (ii)

$$Cr_2O_7^{2-} + 2H_2O \leftrightarrow 2CrO_4^- + 2H^+$$
 (ii)
Orange Yellow

This is a dynamic equilibrium and as such is sensitive to the acidity or basicity of the solution [8]. Based on this notion, Conc. Hydrochloric acid was added into the aqueous solution of potassium dichromate. Conc. Hydrochloric acid reacts with potassium dichromate to produce chlorine, chromium(III) chloride, potassium chloride and water (equation (iii)).

$$14 HCl + K_2 Cr_2 O_7 \xrightarrow{t^*C} 3Cl_2 + 2CrCl_3 + 2KCl + 7H_2 O \quad (iii)$$

Chromium may lose 2e⁻ to form chromous compound, 3e⁻ to form Chromic compounds or 6e⁻ to form the chromates. Chromous compounds are very easily oxidized. This is the reason that they are of little practical value in the leather field. Chromic and chromates are used in leather manufacturing process.

4. Conclusion

A comprehensive scientific assessment on the potential risks associated with chromium in leather has been conducted. It contradicts many opinions presented in the public media. Recent REACH Annex XV Report, Kap. B 5.8 (ECHA 2011) states that there are no reasonable concerns regarding Cr(III) in leather. Furthermore, a scientific investigation carried out by the EU's Chrome (VI) less project indicates that the formation of chromium (VI) in the final leather can be effectively prevented. Standard technologies are readily available to all tanners, enabling them to produce leather with a Cr(VI)-free matrix.

Rarely leather with slightly elevated levels of Cr(VI) have been detected in several samples. Model studies clearly demonstrate

that there is no consumer risk in terms of toxicity or cancer. The results from potential exposure scenario indicate that the risk to a consumer wearing a garment made from such leather is well below detectable levels.

It is crucial to produce leather without any detectable amount of Cr(VI), which is entirely achievable by strictly adhering to specific rules and employing appropriate chemicals. These process technology guidelines are not overly complex; in fact, many tanners already implement them as part of their current practices, requiring a certain level of manufacturing discipline.

Several key points have been developed to avoid Cr(VI) formation during the process to create a leather matrix, which has a built-in insurance to avoid the generation of Cr(VI) during storage and use. The key points are :

- a) Use of premium chrome tanning salts
- b) Elimination of oxidation agents (i.e., bleaching) on leather after tanning
- c) Finishing the wet end processing at (low) pH conditions (3.5 - 4)
- d) Carrying out a final washing
- e) Avoiding the use of excess ammonia prior to the dying process
- f) Use of high-performance softening chemicals i.e., elimination of unsaturated lipids or waxes)
- g) Avoiding the use of chromate pigments i.e., yellow and orange inorganic pigments
- h) Use of 1% and 3% vegetable tannin extract as this provides antioxidant protection
- i) Use of synthetic antioxidants wherever vegetable tanning agents could not be applied

Following these principles state-of-the-art leathers are produced by the tanneries, fulfilling all requirements to avoid any issues with hexavalent chromium in leather.

Replacement of chromium tannage by other tanning technologies wouldn't make the world a safer place, but reduces the technical advantages. However, although huge advancement has been made in the last decade, the international leather industry needs to promote best practice technologies, resulting in a reliably chromium (VI)-free leather matrix.





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ANNEXURE - I



ANALYSIS – EXPORT PERFORMANCE OF LEATHER, LEATHER PRODUCTS AND FOOTWEAR DURING APRIL-OCTOBER 2023 VIS-À-VIS APRIL-OCTOBER 2022

As per officially notified DGCI&S monthly export data, the export of Leather, Leather products &Footwear for the period April – October 2023 touched US \$ 2810.99 Million as against the performance of US \$ 3231.78 Million in April-October 2022, recording a decline of -13.02%. In rupee terms, the export touched Rs. 231993.01 Million in April-October 2023 as against Rs. 255296.92 Million in April-October 2022, recording a decline of -9.13%.

	(Value in Million Rs)								
PRODUCT	APR-OCT	APR-OCT	%	% SHARE	% SHARE				
	2022-23	2023-24	VARIATION	2022-23	2023-24				
FINISHED LEATHER	20266.91	21701.89	7.08%	7.94%	9.35%				
LEATHER FOOTWEAR	115120.6	97922.11	-14.94%	45.09%	42.21%				
FOOTWEAR COMPONENTS	13408.26	13186.33	-1.66%	5.25%	5.68%				
LEATHER GARMENTS	17520.62	18712.13	6.80%	6.86%	8.07%				
LEATHER GOODS	63555.58	60453.64	-4.88%	24.89%	26.06%				
SADDLERY AND HARNESS	11694.6	8995.08	-23.08%	4.58%	3.88%				
NON-LEATHER FOOTWEAR	13730.35	11021.83	-19.73%	5.38%	4.75%				
TOTAL	255296.9	231993	-9.13%	100.00%	100.00%				

EXPORT OF LEATHER, LEATHER PRODUCTS & FOOTWEAR FROM INDIA During April-October 2023-24 VIS-À-VIS April-October 2022-23

Source : DGCI &S

(Value in Million US\$)

DRODUCT	APR-OCT	APR-OCT	%	% SHARE	% SHARE
PRODUCI	2022-23	2023-24	VARIATION	2022-23	2023-24
FINISHED LEATHER	256.9	262.93	2.35%	7.95%	9.35%
LEATHER FOOTWEAR	1457.11	1186.72	-18.56%	45.09%	42.22%
FOOTWEAR COMPONENTS	169.63	159.83 -5.78%		5.25%	5.69%
LEATHER GARMENTS	221.46	226.69	2.36%	6.85%	8.06%
LEATHER GOODS	804.85	732.27	-9.02%	24.90%	26.05%
SADDLERY AND HARNESS	148.11	108.97	-26.43%	4.58%	3.88%
NON-LEATHER FOOTWEAR	173.72	133.58	-23.11%	5.38%	4.75%
TOTAL	3231.78	2810.99	-13.02%	100.00%	100.00%

Source : DGCI &S



Footwear (Leather Footwear, Footwear Components & Non-Leather Footwear) holds the major share of 52.66 % in the total export of leather and leather products with an export value of US \$ 1480.13 Mn.

MONTH WISE EXPORT OF LEATHER, LEATHER PRODUCTS & FOOTWEAR FROM INDIA **DURING APRIL-OCTOBER 2023**

				(value in		99) (40		
DRODUCT	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCTOBER	TOTAL
PRODUCT	2023	2023	2023	2023	2023	2023	2023	APR-OCT 23
FINISHED LEATHER	40.53	38.54	38.02	33.39	40.41	36.6	35.44	262.93
LEATHER FOOTWEAR	142.51	180.63	188.3	202.81	192.44	136.73	143.3	1186.72
FOOTWEAR COMPONENTS	23.54	26.63	24.64	24.9	21.98	18.75	19.39	159.83
LEATHER GARMENTS	24.24	30.11	34.27	38.71	39.51	31.47	28.38	226.69
LEATHER GOODS	96.03	92.94	112.61	104.8	113.54	106.85	105.5	732.27
SADDLERY AND HARNESS	13.03	14	16.69	17.56	17.72	14.69	15.28	108.97
NON-LEATHER FOOTWEAR	21.92	22.67	19.08	17.97	19.18	14.74	18.02	133.58
TOTAL	361.8	405.52	433.61	440.14	444.78	359.83	365.31	2810.99

(Volue in Million LICC)

(Value in Million US\$)

Source : DGCI &S



ANNEXURE - II

ANALYSIS - COUNTRY WISE EXPORT PERFORMANCE OF LEATHER, LEATHER PRODUCTS & FOOTWEAR FROM INDIA DURING APRIL-OCTOBER 2023 VIS-A-VIS APRIL-OCTOBER 2022

		TOTAL	SHARE IN TOTAL	SHARE IN TOTAL		
COUNTRY	APR-OCT 2022	APR-OCT 2023	% CHANGE 2023	EXPORT APR-OCT 2022	EXPORT APR-OCT 2023	
U.S.A.	790.52	539.15	-31.80%	24.46%	19.18%	
GERMANY	356.15	322.83	-9.36%	11.02%	11.48%	
U.K.	309.52	241.04	-22.12%	9.58%	8.57%	
ITALY	213.22	194.85	-8.62%	6.60%	6.93%	
FRANCE	156.97	140.17	-10.70%	4.86%	4.99%	
SPAIN	126.45	143.24	13.28%	3.91%	5.10%	
U.A.E.	68.31	64.54	-5.52%	2.11%	2.30%	



		TOTAL	SHARE IN TOTAL	SHARE IN TOTAL	
COUNTRY	APR-OCT 2022	APR-OCT 2023	% CHANGE 2023	EXPORT APR-OCT 2022	EXPORT APR-OCT 2023
NETHERLANDS	134.89	111.48	-17.35%	4.17%	3.97%
HONG KONG	37.08	41.33	11.46%	1.15%	1.47%
CHINA	82.48	80.67	-2.19%	2.55%	2.87%
POLAND	46.89	66.67	42.18%	1.45%	2.37%
BELGIUM	82.96	104.41	25.86%	2.57%	3.71%
SOMALIA	27.7	17.35	-37.36%	0.86%	0.62%
VIETNAM	39	46.69	19.72%	1.21%	1.66%
AUSTRALIA	53.94	46.59	-13.63%	1.67%	1.66%
PORTUGAL	45.35	33.76	-25.56%	1.40%	1.20%
DENMARK	50.92	31.56	-38.02%	1.58%	1.12%
KOREA REP.	28.87	24.2	-16.18%	0.89%	0.86%
JAPAN	45.92	45.77	-0.33%	1.42%	1.63%
RUSSIA	20.51	39.21	91.18%	0.63%	1.39%
S. AFRICA	20.81	20.56	-1.20%	0.64%	0.73%
CHILE	25.26	19.31	-23.56%	0.78%	0.69%
MALAYSIA	16.98	22.71	33.75%	0.53%	0.81%
AUSTRIA	28.8	26.38	-8.40%	0.89%	0.94%
CANADA	46.68	33.01	-29.28%	1.44%	1.17%
SWEDEN	16.78	13.94	-16.92%	0.52%	0.50%
NIGERIA	10.02	7.04	-29.74%	0.31%	0.25%
INDONESIA	13.35	15.06	12.81%	0.41%	0.54%
MEXICO	22.5	24.06	6.93%	0.70%	0.86%
SAUDI ARABIA	21.76	26.63	22.38%	0.67%	0.95%
KENYA	5.44	5.76	5.88%	0.17%	0.20%
SWITZERLAND	16.25	9.22	-43.26%	0.50%	0.33%
SLOVAK REP	13.19	5.83	-55.80%	0.41%	0.21%
HUNGARY	7.44	5.73	-22.98%	0.23%	0.20%

		TOTAL	SHARE IN TOTAL	SHARE IN TOTAL		
COUNTRY	COUNTRY APR-OCT APR-OCT 2022 2023		% CHANGE 2023	EXPORT APR-OCT 2022	EXPORT APR-OCT 2023	
THAILAND	9.5	11.5	21.05%	0.29%	0.41%	
BANGLADESH	10.03	10.4	3.69%	0.31%	0.37%	
FINLAND	9.56	8.18	-14.44%	0.30%	0.29%	
TURKEY	14.7	13.58	-7.62%	0.45%	0.48%	
ISRAEL	9.89	9.94	0.51%	0.31%	0.35%	
CAMBODIA	5.29	6.6	24.76%	0.16%	0.23%	
CZECH REPUBL	6.19	6.77	9.37%	0.19%	0.24%	
GREECE	5.5	7.19	30.73%	0.17%	0.26%	
NEW ZEALAND	5.62	4.26	-24.20%	0.17%	0.15%	
OMAN	5.18	4.8	-7.34%	0.16%	0.17%	
SRI LANKA DES	3.1	5.34	72.26%	0.10%	0.19%	
SINGAPORE	7.19	7.07	-1.67%	0.22%	0.25%	
SUDAN	1.4	0.53	-62.14%	0.04%	0.02%	
TAIWAN	3.46	3.78	9.25%	0.11%	0.13%	
NORWAY	4.14	4.46	7.73%	0.13%	0.16%	
DJIBOUTI	1.17	1.51	29.06%	0.04%	0.05%	
OTHERS	146.85	134.33	-8.53%	4.54%	4.78%	
TOTAL	3231.78	2810.99	-13.02%	100.00%	100.00%	

Source : DGCI &S

The **Top 15 countries** together account about 76% of India's total leather & leather products export during April-October 2023 with export value of US \$ 2189.43 Mn.



ANNEXURE - V

ANALYSIS – INDIA'S IMPORT OF LEATHER, LEATHER PRODUCTS AND FOOTWEAR DURING APRIL-OCTOBER 2023 VIS-À-VIS APRIL-OCTOBER 2022

As per officially notified DGCI&S monthly India's Import Data, the Import of Raw Hides & Skins, Leather and Leather products for the period April-October 2023 touched US \$ 745.29 Million as against the performance of US \$ 918.3 Million in April-October 2022, recording a decline of -18.84%.



INDIA'S IMPORT OF LEATHER, LEATHER PRODUCTS & FOOTWEAR DURING April-Oct 2023-24 VIS-À-VIS April-Oct 2022-23

		-			
PRODUCT	APR-OCT	APR-OCT	%	% SHARE	% SHARE
PRODUCT	2022-23	2023-24	VARIATION	2022-23	2023-24
RAW HIDES AND SKINS	22.38	13.4	-40.13%	2.44%	1.80%
FINISHED LEATHER	299.38	235.28	-21.41%	32.60%	31.57%
LEATHER FOOTWEAR	287.33	267.2	-7.01%	31.29%	35.85%
FOOTWEAR COMPONENTS	24.54	12.17	-50.41%	2.67%	1.63%
LEATHER GARMENTS	0.53	1.08	103.77%	0.06%	0.14%
LEATHER GOODS	33.83	39.8	17.65%	3.68%	5.34%
SADDLERY AND HARNESS	2.01	1.6	-20.40%	0.22%	0.21%
NON-LEATHER FOOTWEAR	248.3	174.76	-29.62%	27.04%	23.45%
TOTAL	918.3	745.29	-18.84%	100.00%	100.00%

(Value in Mn US\$)

Source : DGCI &S

India's Import of different categories of Footwear holds a major share of about 61% in India's total leather & leather product including Non-Leather Footwear with an Import value of US \$ 454.13 Mn. This is followed by Finished Leather with a share of 31.57%, Raw Hides & Skins 1.80%, Leather Goods & Accessories 5.34%, Saddlery & Harness 0.21% and Leather Garments 0.14%.

MONTH WISE INDIA'S IMPORT OF LEATHER, LEATHER PRODUCTS & FOOTWEAR DURING APRIL-OCTOBER 2023

				(Value in	Million US	\$\$)		
DRODUCT	APRIL	MAY	JUNE	JULY	AUGUST	SEPT	OCTOBER	TOTAL
PRODUCI	2023	2023	2023	2023	2023	2023	2023	APR-OCT 23
RAW HIDES & SKINS	2.1	1.63	1.82	2.23	2.01	1.88	1.73	13.4
FINISHED LEATHER	32.28	41.2	25.98	34.02	35.1	34.54	32.16	235.28
LEATHER FOOTWEAR	23.14	46.34	66.28	32.96	26.08	33.89	38.51	267.2
FOOTWEAR COMPONENTS	2.16	2.46	1.24	1.29	1.14	2.01	1.87	12.17
LEATHER GARMENTS	0.05	0.12	0.15	0.11	0.21	0.15	0.29	1.08
LEATHER GOODS	4	4.93	6.45	5.22	6.76	4.45	7.99	39.8
SADDLERY AND HARNESS	0.11	0.26	0.24	0.22	0.37	0.19	0.21	1.6
NON-LEATHER FOOTWEAR	25.48	42.42	41.25	14.75	10.84	17.71	22.31	174.76
TOTAL	89.32	139.36	143.41	90.8	82.51	94.82	105.07	745.29

Source : DGCI &S







PRESS RELEASE

CLE unveils Vision Document 2030 for Leather & Footwear Industry, in the National Export Excellence Awards Event held in New Delhi on 10.01.2024 and presents 64 Awards under various categories.

The Indian leather and footwear industry has a long history. The industry has combined its traditional strengths of huge raw material base and manpower availability, with the application of modern technological tools to become a leading manufacturer exporter of value-added products. The leather industry is also a labour-intensive sector with a workforce of about 4.42 million, 40% of whom are women.

Council for Leather Exports (CLE), the Export Promotion Council for Leather, Leather Products, Leather Footwear, Non-Leather Footwear, Footwear components etc functioning under Ministry of Commerce & Industry, Govt of India, has prepared a Vision Document 2030 for Leather and Footwear Industry, which aims at substantially increasing the turnover of the industry (industry size) from USD 17.26 billion during 2022-23 (exports of USD 5.29 billion and domestic industry turnover of USD 12 billion) to USD 47.1 billion by 2030 (export turnover of USD 13.7 billion and domestic industry turnover of USD 33. 4 billion). The Vision Document outlines the global outlook of the industry, current status of the industry in India, global benchmarking and best practices, market and industry pulse analysis, policy, regulatory and infrastructure landscape, recommendations splitting into short term, medium-term and long-term, overview of multi prolonged action agenda to achieve the Vision for 2030, domestic market vision and export market vision for 2030.

The Vision Document 2030 for Leather & Footwear Industry was released on 10th January 2024 at Hotel Taj Palace, New Delhi by Shri Rajeev Singh Thakur, IAS, Additional Secretary, Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry, Government of India in the National Export Excellence Awards Event organised by Council for Leather Exports (CLE).

Shri Sanjay Leekha, Chairman-CLE, has said 'CLE has taken the initiative to prepare Vision Document for the 'Footwear, Leather, Leather Products and Accessories sector' in the country. Footwear here includes both leather footwear as well as non-leather footwear. Series of industry consultations were held with the stakeholders in the past about one year, and based on the diverse views emerged, the CLE has brought out the Vision Document 2030, with the professional assistance of a renowned consulting firm. In nutshell, the Vision Document 2030 for Leather & Footwear Industry is aiming to substantially increase the production and exports in the next 5-7 years and reach the total turnover (industry size) of around USD 47.1 billion by 2030 from the present level of USD 17.26 billion. These target figures includes both the domestic market sales and export sales. The present industry size is US \$ 17.26 billion consist of domestic turnover of US \$ 12.00 billion and export turnover of US \$ 5.26 billion. From here, the industry is looking to increase the industry size to US \$ 47.1 billion consist of domestic turnover of USD 33.4 billion and export turnover of USD 13.7 billion. It is also pertinent to mention that out of the US \$ 47.1 billion target, share of footwear sector (both Leather footwear as well as non-leather footwear) is around 50% which shows the importance of the footwear sector in accelerating the production and exports. To attain this ambitious vision, the Document has outlined the intervention measures and strategies, categorizing into short term, medium term and long term'.

During the National Export Award Event held on 10th January 2024, CLE presented the Export Awards for FY 2022-23 were to a total of 64 awardees under various categories namely export performance, brand creation and women entrepreneurs. In the overall Exports of Leather, Leather Products & Footwear (made of leather as well as made of non-leather), 1st Place was awarded



to Feng Tay India Group (located in Tiruvannamalai District, Tamil Nadu), 2nd place was awarded to Apache Footwear India Pvt Ltd (located in Tirupati District, Andhra Pradesh) and 3rd Place was awarded to Tata International Group (located in Ranipet, Tamil Nadu). Under Exports above Rs.300 Crore category, 6 awards were presented. Under Exports between Rs.200 Crore and upto Rs.300 Crore category, 6 awards were presented. Under exports between Rs.100 Crore and upto Rs.200 Crore category, 15 awards were presented. Under Exports upto Rs.100 Crore category, 24 awards were presented. 5 awards were presented for Brand Creation, and awards were presented to 5 Women Entrepreneurs. In all, total of 64 Awards were presented by CLE for the FY 2022-23.

Shri Rajendra K. Jalan, Vice-Chairman -CLE in his remarks stated 'Leather Products and Footwear have the unique qualities of not only being essential lifestyle products but also fashion oriented products. Even while the market is placing emphasis on innovation & design, there is increasing focus on sustainable development. As we are aiming at more growth levels in the coming years, our strategy should be to produce innovative, well designed and sustainable products. I am sure that achievers in the global market have already adopted this strategy. The CLE is proud to be associated with achievers in our industry who are the flag bearers of the country and is honoured to present National Export Excellence Awards 2022-23 to manufacturer-exporters who, by their tireless efforts, have brought laurels not only to themselves but also to the country. I would like to congratulate all the Award Winners for their laurels and wish them more successes in their endeavours".

Shri Rajeev Singh Thakur, IAS, Additional Secretary, DPIIT, Govt of India was the Chief Guest of the Event. Shri Sanjay Leekha, Chairman-CLE, Shri Rajendra Kumar Jalan, Vice-Chairman-CLE, Shri P R Aqeel Ahmed, Former Chairman-CLE, Shri Motilal Sethi, Regional Chairman (North)-CLE, Shri Mukhtarul Amin, Chairman-Leather Sector Skill Council, Shri Ramesh Kumar Juneja, Regional Chairman (East)-CLE, Shri R. Selvam, IAS, Executive Director-CLE, and industry stakeholders participated in the event. Officials from various departments /ministries of the Government of India attended the event.

Press Release issued by: Council for Leather Exports (CLE) Date: 12th January 2024

National Export Excellence Awards of Leather & Footwear Industry for FY 2022-23

	F	Overall – Leather, Leather Products & ootwear (made of Leather as well as non-Leather)	
1 st Place	:	FENG TAY INDIA GROUP, Tiruvannamalai District, Tamil Nadu	
2 nd Place	:	APACHE FOOTWEAR INDIA PVT LTD, Tirupati District, Andhra Pradesh	
3 rd Place	:	TATA INTERNATIONAL GROUP, Ranipet, Tamil Nadu	
		Exports Above Rs.300 Crores	
LEATHER FOOTWEAR			
1 st Place	:	APACHE FOOTWEAR INDIA PVT LTD, Tirupati District	
2 nd Place	:	TATA INTERNATIONAL GROUP, Ranipet	
LEATHER GOODS			
1 st Place	:	A V THOMAS LEATHER & ALLIED PRODUCTS PVT LTD., Chennai	



NON-LEATHER FOOTWEAR

1 st Place 2 nd Place	:	FENG TAY INDIA GROUP, Tiruvannamalai District APACHE FOOTWEAR INDIA PVT LTD. Tirupati District
LEATHER GARMENTS		
1 st Place	:	BHARTIYA INTERNATIONAL LTD, Gurugram
		Exports Above Rs.200 Crores & Upto Rs.300 Crores
LEATHER FOOTWEAR		
1 st Place	:	AFPL GLOBAL PRIVATE LIMITED, Kanpur
2 nd Place	:	ROGER GROUP, Agra
LEATHER GOODS		
1 st Place	:	KHEMCHAND HANDICRAFT, Jodhpur
2 nd Place	:	TANGERINE DESIGN PVT. LTD, Gurugram
INDUSTRIAL LEATHER G	LOVES	
1 st Place	:	INDUSTRIAL SAFETY PRODUCTS GROUP, Kolkata
FINISHED LEATHER		
1 st Place	:	PRARA LEATHERS GROUP, Chennai
		Exports Above Rs.100 Crores & Upto Rs.200 Crores
LEATHER FOOTWEAR		
1 st Place		ALTHAE SHOES GROUP. Chennai
2 nd Place	:	LAMBA FOOTWEAR INDUSTRIES, Agra
LEATHER GARMENTS		
1 st Place	:	S.M. LULLA INDUSTRIES WORLDWIDE, Chennai
2 nd Place	:	GEMINI ENTERPRISES, Chennai
LEATHER GOODS		
1 st Place	:	ALPINE APPARELS PVT LTD. Faridabad



FINISHED LEATHER

1 st Place	:	MODEL TANNERS, Kanpur
2 nd Place	:	SUPER TANNERY GROUP, Kanpur
NON-LEATHER FO	OTWEAR	
1 st Place	:	NEXGEN FOOTWEARS PVT LTD., New Delhi
2 nd Place	:	RELAXO FOOTWEARS LIMITED, New Delhi
FOOTWEAR COMI	PONENTS (SHOE UPP	ER)
1 st Place	:	ALTHAF SHOES GROUP, Chennai
2 nd Place	:	BBK SHOES, Ranipet
INDUSTRIAL LEA	THER GLOVES	
1 st Place	:	RAMA OVERSES LTD, Kolkata
2 nd Place	:	ACKNIT INDUSTRIES LIMITED, Kolkata
HARNESS & SADI	DLERY (NON LEATHE	R)
1 st Place	:	SUPERHOUSE GROUP, Kanpur
		Exports Upto Rs.100 Crores
LEATHER FOOTW	EAR	
1 st Place	:	HABEEB TANNING COMPANY, Chennai
2 nd Place	:	KORA SHOES PVT. LTD, Chennai
LEATHER GARME	NTS	
1 st Place	:	APOLLO GREEN ENERGY LIMITED, Noida
2 nd Place	:	CENTURY OVERSEAS, New Delhi
LEATHER GOODS		
1 st Place	:	ASG LEATHER PRIVATE LIMITED, Kolkata
2 nd Place	:	TRIO TREND EXPORTS PRIVATE LIMITED, Kolkata
FINISHED LEATH	ER	
1 st Place	:	SUPERHOUSE GROUP, Kanpur
2 nd Place	:	RAHMAN INDUSTRIES LIMTED, Kanpur



NON-LEATHER FOOTWEAR

1 st Place 2 nd Place	:	TATA INTERNATIONAL GROUP, Ranipet CONDOR FOOTWEAR GROUP, Surat
FOOTWEAR COMPONEN	TS (SHOE UPPER)	
1 st Place 2 nd Place	:	HABEEB TANNING COMPANY, Chennai COMPETENCE EXPORTS PRIVATE LIMITED, Kanpur
INDUSTRIAL LEATHER G	LOVES	
1 st Place 2 nd Place	:	VINIT GLOVES MANUFACTURING PVT. LTD, Kolkata ZENITH APEX PRIVATE LIMITED, Kolkata
HARNESS & SADDLERY	(LEATHER)	
1 st Place 2 nd Place	:	S.K. EXPORTS, Kanpur KINGS INTERNATIONAL LTD, Kanpur
HARNESS & SADDLERY	(NON-LEATHER)	
1 st Place 2 nd Place	:	MIREEN INDUSTRIES PVT. LTD, Gurugram TARUN TEXTILES, Kanpur
FASHION /SPORTS LEAT	HER GLOVES	
1 st Place 2 nd Place	:	HIJAZ GROUP, Chennai AALA GLOVES, Chennai
FOOTWEAR COMPONEN	TS (OTHER THAN S	HOE UPPER) - Other Components
1 st Place 2 nd Place	:	WILHELM TEXTILES INDIA PVT. LTD., Gurugram VERSATILE ENTERPRISES PVT. LTD., Ludhiana
FOOTWEAR COMPONEN	TS (OTHER THAN S	HOE UPPER) - Soles
1 st Place 2 nd Place	:	UNISOL INDIA PVT LTD. Noida SANT RUBBERS LIMITED, Jalandhar
WOMEN ENTREPRENEU	R AWARD 2022-23	8
1. Smt. VIJAYA KO (Leather Shoe L)RA , Partner, Ajantl Ippers)	na Shoe Company, Chennai for manufacturing and exports of Footwear Components

2. Smt. REENA SACHAN, Director, Growmore International Limited, Kanpur for manufacturing and exports of Leather Goods & Accessories



- 3. Smt. SHRUTI MANGLA, Director, Orion Conmerx Pvt Ltd, New Delhi for manufacturing and exports of Leather Garments, Leather Bags & Accessories
- 4. Smt. ANNAPURNA TIWARI, Partner, Parth Exim, Kanpur for manufacturing and exports of Saddlery & Harness (Non-Leather).
- 5. Smt. A. SIDHRA FATHIMA, Partner, Vista Shoes, Chennai for manufacturing and exports of Leather Footwear

BRAND CREATION AWARD 2022-23

- 1. Jama Corporation Private Limited, Kanpur for Leather Footwear for the Brands OLDWEST and RIDE & STYLE
- 2. Condor Footwear Limited, Surat for Non-Leather Footwear for the Brand AEROWALK
- 3. Wilhelm Textiles India Private Limited, Gurugram for Footwear Components (other than shoe uppers) for the Brand WILHELM TEXTIL
- 4. Kings International Ltd., Kanpur for Saddlery & Harness (Leather) for the Brand KINGSTON
- 5. Amit Leather Wears, New Delhi for Leather Garments for the Brand DANIER



Shri Rajeev Singh Thakur, IAS, Additional Secretary, DPIIT, Government of India releasing the **VISION DOCUMENT 2030 FOR LEATHER & FOOTWEAR INDUSTRY** prepared by CLE on 10.01.2024 at New Delhi, in the presence of Shri Sanjay Leekha, Chairman-CLE, Shri Rajendra K Jalan, Vice Chairman-CLE, flanked by Shri Mukhtarul Amin, Chairman, Leather Sector Skill Council, Shri P R Aqeel Ahmed, Former Chairman-CLE, and Shri Motilal Sethi, Regional Chairman (North), CLE.





Shri Rajeev Singh Thakur, IAS, Additional Secretary, DPIIT, Government of India releasing the **National Export Excellence Award 2022-23 Booklet** on 10.01.2024 in the presence of Shri Sanjay Leekha, Chairman-CLE, Shri Rajendra K Jalan, Vice Chairman-CLE, flanked by Shri Mukhtarul Amin, Chairman, Leather Sector Skill Council, Shri P R Aqeel Ahmed, Former Chairman-CLE, and Shri Motilal Sethi, Regional Chairman (North), CLE



Presentation of overall Export Award 2022-23 - 1st Place - to Feng Tay India Group







Presentation of overall Export Award 2022-23 - 2nd Place - to Apache Footwear India Pvt Ltd



Presentation of overall Export Award – 3rd Place – to Tata International Group



News Corner_____



View of participants in the CLE National Exports Excellence Awards 2022-23 Event held on 10th January 2024 at Taj Palace, New Delhi



Presentation of Women Entrepreneur Award 2022-23




Presentation of National Export Excellence Awards 2022-23



Presentation of National Export Excellence Awards 2022-23





Presentation of National Export Excellence Awards 2022-23

LEATHER EXPORTERS SEEK FISCAL IN-CENTIVES IN BUDGET



The Council for Leather Exports (CLE) has asked the government to provide fiscal incentives in the Budget such as the PLI scheme and reinstatement of import duty exemption on certain goods to boost manufacturing and exports. The council has also suggested the government to consider permitting the export of all value-added leathers, including crust leathers, freely without any export duty, norms, inspection, testing or certification. CLE Chairman Sanjay Leekha said that the import duty exemption was available to the industry for the last 30 years but was withdrawn two years back and this has made the availability of international leather difficult for the industry.

"In case, it is reinstated, it could ensure that our products manufacturing sectors would have access to international leather and hence make us more competitive and more up-todate with our product offerings," he said.

He also said that export duty should be levied only on Raw Hides and Skins, Wet Blue Leathers and anything beyond that should be considered as a finished product and it should be freely permitted to be exported.

"This has actually become a necessity because, in the last few years, our sector has lost almost USD 1 billion of exports...We can bring back USD 1 billion of exports if the norms are changed," he added.

The council has also sought an extension of the PLI (Production Linked Incentive) scheme to the leather and footwear sector to





promote domestic manufacturing. On exports, he said, unfortunately, there is a little downtrend due to the global slowdown in the current year.

However, he expressed confidence that the slowdown is temporary, and the exports will bounce back.

"We have set some very aggressive exports targets for our industry. In fact, at the current level of about USD 5 billion or little over that, we expect our industry to reach USD 12.5 billion by 2030," he added.

(Source : Economic Times - 13/01/2024)

INDIA'S LEATHER & FOOTWEAR SECTOR TO HIT \$47BN BY '30



The size of India's leather and footwear industry is set for a robust growth hitting \$47 billion by 2030 from the current levels of around \$17.3 billion. The exports will more than double at \$13.7 billion over the next six years.

This has been revealed in the vision document 2030 for leather & footwear industry released by the Council for Leather Exports (CLE), the export promotion council for leather, leather products, leather footwear, non-leather footwear and footwear components, functioning under the Union ministry of commerce and industry in New Delhi on Wednesday.

A CLE statement here on Friday said, the vision document for the footwear, leather, leather products and accessories sector outlines various aspects of the industry including the global outlook, global benchmarking and best practices, infrastructure landscape and recommendations on short, medium and long term.

Sanjay Leekha, chairman of CLE, said the vision document 2030 is aiming at increasing production and exports in the

next 5-7 years and reaching the industry size of around \$47.1 billion by 2030.

"The present industry size is \$ 17.3 billion comprise domestic turnover of \$12 billion and export turnover of around \$5.3 billion. From here, the industry is looking to increase the industry size to \$47.1 billion consisting of domestic turnover of \$33.4 billion and export turnover of \$13.7 billion. It is also pertinent that out of the \$47.1 billion target, the share of the footwear sector (both leather and non-leather) is around 50%, which shows the importance of the footwear sector in accelerating the production and exports."

(Source : timesofindia.indiatimes.com – 13/01/2023)

DISTRESSED SHADES OF GRAY DRAPE THE REEBOK CLASSIC LEATHER LTD



Reebok LTD, which stands for Learn, Test, and Design, was conceptualized to bring innovative, fashion-forward versions of popular classic Reebok silhouettes to market. So far we've only seen a handful of LTD drops; most of which have centered around the Reebok Club C.

Now, Reebok and co. give their Classic Leather silhouette the LTD treatment, delivering a pre-worn looking shoe that aligns well with the trend popularized by Maison Margiela years ago.

The all-leather upper on this pair sports distressed gray/ black calf leather, accentuated by dark stitching and debossed Reebok branding. Below is where the shoe really stands out, as the LTD invention ditches the traditional sole of the Classic Leather for a bulkier alternative, capitalizing on the ongoing chunky shoe trend.





The Reebok Classic Leather LTD has already popped up at various EU and UK retailers, but no information has been made available regarding a global release.

Enjoy detailed images below and stay current on our Sneaker Release Dates page as we continue to monitor upcoming drops.

(Source : https://sneakernews.com - 12/01/2024)

MONTBLANC MEISTERSTÜCK COLLEC-TION: THE ART OF THE LEATHER



Inspired by its near century-long experience in creating luxury writing instruments, the 2023 Meisterstück Collection symbolises the Montblanc's mastery at blending design, material, function, aesthetics, and artistic brilliance into a luxury master class. Besides the classic black, the signature line this year also features products in ink blue, a colour inspired by the brand's roots in writing.

An ink-stained heritage glass bottle discovered in the archives also inspired Artistic Director Marco Tomasetta to introduce the centuries-old art of the 'sfumato effect' on a selection of pieces./ The term which comes from the Italian word 'sfumare' meaning 'evaporate like a smoke' was first used for Leonardo da Vinci paintings to describe the subtle gradations in the shades of a colour.

Tomasetta has used the Sfumato effect on bags in warm burgundy and modern forged iron colours, where the colour transitions from darker shades at the bottom to lighter tones at the top. The effect was created manually using an airbrush on the finished leather. Each sfumato piece thus becomes one-ofa-kind, a testament to the art of craftsmanship that is so special for the brand.

In Tomasetta's words, "The visual identity of this collection is rooted in the iconic design elements of one of the most celebrated symbols of writing culture. As a collection that is always evolving, the latest pieces explore an additional dimension of writing with colours and effects directly inspired by the beauty of ink and the effect it creates as it takes hold. The importance placed on the functional value of each piece to its owner is reflected in the selection of new shapes and styles that make these pieces versatile and adaptable."

(Source : www.mansworldindia.com – 12/01/2024)

STAHL LAUNCHES NEW BRAND IDENTITY



The rebranding follows the recent acquisition of Stahl Packaging Coatings (formerly ICP Industrial Solutions Group) as well as a new purpose: "Touching lives, for a better world."

The company has a new logo, which they say symbolises the unique "touch" of Stahl and the transformative qualities of its coatings and finishes, as well as a new colour palette to visualise and differentiate its activities.

Stahl CEO Maarten Heijbroek said: "Launching our new visual brand identity is an important milestone in our strategic journey. Building on our proud heritage, it offers a visual representation of our vision for the future, capturing our commitment to leading in innovation and sustainability and supporting the changing needs of our customers and markets.

"This will ensure that the world sees Stahl as it is today: a purpose-driven business built on three distinct pillars – Leather,





Performance Coatings and Packaging Coatings – and a company leading in sustainable, high-value-added solutions. Meanwhile, our products continue to be touched by consumers far and wide, as they are applied to essential everyday materials in countless industries and markets. With our dynamic new look and feel, we can now tell our story in a way that resonates with our stakeholders around the world."

(Source : ILM – 11/01/2024)

GOAT LEATHER MARKET SIZE: EVALUATING SHARE AND SCOPE (2024-2031)



Current Trends in the Goat Leather Market :

In the contemporary **Goat Leather Market**, sustainability is a critical pillar of growth. Beyond corporate responsibility, embracing sustainable practices enhances brand reputation, attracts environmentally conscious consumers, and mitigates risks associated with evolving environmental regulations. Companies committed to sustainable growth contribute to a healthier bottom line and a positive societal impact.

In essence, the growth trajectory in the Goat Leather market is intricately linked with an unwavering commitment to continuous improvement. Companies that make the deliberate choice to prioritize the ongoing refinement of their processes, products, and customer experiences position themselves as true market leaders. This relentless pursuit of excellence becomes a driving force, ensuring that they not only meet the current demands of the market but also proactively stay ahead in an environment characterized by perpetual evolution. By fostering a culture of innovation and adaptability, these forward-thinking entities create a dynamic framework that allows them to navigate uncertainties, embrace emerging trends, and maintain a competitive edge. In a landscape where change is constant, this commitment to continuous improvement becomes a cornerstone for sustained success and resilience in the everevolving Goat Leather market.

Competitive Scene of the Goat Leather Market :

The Goat Leather market is marked by a dynamic and rapidly changing competitive landscape. A multitude of players, spanning from well-established industry leaders to pioneering start-ups, compete for market share and supremacy. Rigorous competition cultivates an ongoing pursuit of innovation and exceptional performance as companies strive to distinguish themselves through superior product quality, pricing tactics, and customer satisfaction. Market dynamics are shaped by variables such as technological innovations, regulatory modifications, and evolving consumer preferences. This dynamic competition not only drives market expansion but also poses challenges and opportunities for participants, fostering strategic collaborations, consolidations, and takeovers as businesses strive to maintain a competitive edge in this constantly evolving environment. In general, the Goat Leather market presents a captivating array of competition, where the ability to adjust and come up with new ideas are crucial factors for achieving success.

Goat Leather Market: Future Demand and Top Key Players :

- Haining Fusheng Fur Leather
- Huzhou Dhatr
- Zhejiang Jinxin
- Xinxiang Heitian Mingliang
- Henan Prosper Skins & Leather

The future demand and key players in the Goat Leather market are poised to play pivotal roles in shaping the industry's trajectory. Anticipated demand in the coming years is expected to be driven by specific factors, such as technological advancements, changing consumer behaviours, regulatory shifts, or global trends. As the market evolves, several key players will likely emerge as influential forces. Among the top contenders are leading companies or organizations, known for their innovation, market presence, and strategic initiatives.

Goat Leather Market by Type :

• Dried



- Raw
- Tanned Or Crust
- Wet-Blue

Goat Leather Market by Application :

- Furniture
- Car Seats
- Leather Shoes
- Competitor Analysis
- The report also provides analysis of leading market participants including:
- Key companies Goat L

Goat Leather Market Scope of the Report :

The scope of the report on the Goat Leather market encompasses a comprehensive analysis of various key elements, providing stakeholders with valuable insights into the industry's dynamics. The report is designed to thoroughly examine market trends, growth drivers, challenges, and opportunities within the specified timeframe. It includes a detailed assessment of market segments, such as product types, applications, and regions, providing a granular view of the market landscape.

Goat Leather Market Geography :

The geographical scope of the Goat Leather market pertains to the specific regions or countries that are encompassed by the market analysis. The extent of geographic coverage for "Goat Leather" can vary depending on the specific industry or market being discussed. Below is a versatile template that you can customize by substituting "Goat Leather" with the appropriate industry or market.

The Goat Leather market showcases a heterogeneous geographical terrain, encompassing analysis and insights across multiple regions and countries. This comprehensive evaluation covers major international markets, such as North America, Europe, Asia-Pacific, Latin America, the Middle East, and Africa, among others. Every region has a distinct impact on the market dynamics, which are shaped by various factors including economic conditions, regulatory frameworks, technological uptake, and cultural inclinations.

News Corner

(Source : artrocker.tv/news - 12/01/2024)

LEATHER EXPORTERS SEEK FISCAL INCENTIVES IN BUDGET



The Council for Leather Exports (CLE) has asked the government to provide fiscal incentives in the Budget such as the PLI scheme and reinstatement of import duty exemption on certain goods to boost manufacturing and exports.

The council has also suggested the government to consider permitting the export of all value-added leathers, including crust leathers, freely without any export duty, norms, inspection, testing or certification.

CLE Chairman Sanjay Leekha said that the import duty exemption was available to the industry for the last 30 years but was withdrawn two years back and this has made the availability of international leather difficult for the industry.

"In case, it is reinstated, it could ensure that our products manufacturing sectors would have access to international leather and hence make us more competitive and more up-todate with our product offerings," he said.

He also said that export duty should be levied only on Raw Hides and Skins, Wet Blue Leathers and anything beyond that should be considered as a finished product and it should be freely permitted to be exported.

"This has actually become a necessity because, in the last few years, our sector has lost almost USD 1 billion of exports...We





can bring back USD 1 billion of exports if the norms are changed," he added.

The council has also sought an extension of the PLI (Production Linked Incentive) scheme to the leather and footwear sector to promote domestic manufacturing.

On exports, he said, unfortunately, there is a little downtrend due to the global slowdown in the current year.

However, he expressed confidence that the slowdown is temporary, and the exports will bounce back.

"We have set some very aggressive exports targets for our industry. In fact, at the current level of about USD 5 billion or little over that, we expect our industry to reach USD 12.5 billion by 2030," he added.

(Source : finalcialexpress.com – 16/01/2024)

NEW CHAIRMAN OF COUNCIL FOR LEATHER EXPORTS

Shri Rajendra Kumar Jalan, Vice – Chairman, Council for Leather Exports (CLE) has taken charge as Chairman of CLE in the 178th meeting of Committee of Administration of CLE held in New Delhi on 16.1.24 through Hybrid mode.



Shri Rajendra Kumar Jalan, is a technocrat engaged in the leather industry for almost 47 years. Earlier, Shri Jalan has served as Chairman of CLE during January 2013 to January 2015 and also as Vice – Chairman, CLE. Shri Jalan has also served in Governing Council of Footwear Design and Development Institute (FDDI), Board of Governor of Central Footwear Training Institute (CFTI), Agra and Academic Council Member of Madan Mohan Malaviya Technical University, Gorakhpur and Har Court Butler Technical University, Kanpur. He is also been nominated as a Research Council Member of Central Leather Research Institute, Chennai by Department of Science and Technology in 2017 and continues to serve the institution pro-actively. Shri Jalan actively participated in various working groups of XII Five Year Plan, which gave deep insight into what is going to come for the industry.

He has been conferred by WORLD CUSTOMS ORGANIZATION Certificate of Merit in the year 2014 for rendering exceptional service to the International Customs Community.

The contact details of Chairman, CLE are given below for kind information.

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Valorisation of Invasive Species -For Leather, Fur, Bristle, Meat and By-Products

(Part-13)

Subrata Das, M.Tech (Leather Technology)

Freelance Leather Technologist & Consultant, Chennai

Hippopotamus



The hippopotamus is indigenous to and widely distributed in Sub-Saharan Africa.(1) It has confirmed presence in 29 countries, with overall population estimates ranging from 115,000 to 130,000 individuals.(2) The biggest herd, comprising 130 of the mammals, outside Africa is in Colombia, 11,000 km away from its natural distribution range.(3)

The present status of the hippos in Colombia is diametrically opposite to that of the species in Africa, where it has been listed as vulnerable by the International Union for Conservation of Nature (IUCN), since 2017. Whereas in Colombia, due to its prolificacy and territorial spread, the gargantuan beast has earned the infamy of being the largest invasive animal in the world. (4) After acquiring prodigious swathes of land in 1978, the founder and undisputed leader of the Medellin Cartel, drug lord Pablo Escobar, built a ultra-luxurious Spanish–style villa, as his recreational home, on a sprawling ranch called Hacienda Napoles (Naples Estate) - as a tribute to Al Capone, the Napolidescended gangster who terrorized the city of Chicago in the 1920s - spread over 20 square kilometers, in Puerto Triunfo, in Antioquia Department, 150 km east of Medellin in Colombia.

The estate featured verdant lawns, vast lakes, enormous swimming pools, a bullring, where Escobar reportedly machinegunned bulls, a Formula-1 as well as a go-kart-racing track and a collection of luxury cars and bikes. The statue of a solitary woolly mammoth and six gigantic concrete dinosaurs, including

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a triceratops impaling a T-rex, built for the Capo's young daughter Manuela, glowered over the property and the singleengine private plane, a Piper PA -18 Super Club, which had flown the "El Padrino's" first cocaine shipment to the US, proudly sat, affixed atop the entrance gate of the hacienda. The grounds accommodated a private airport, a park and arguably the "jewel in the crown" – a private zoo, housing two hundred birds and animals, some exotic among them, which had never been seen earlier in Colombia.

Among these were rhinos, zebras, bison, antelopes, giraffes, ponies, rare goats, flamingos, black cockatoos and ostriches. In a dramatic display of altruism, "El Patron" permitted both school children and the public unhindered access to the zoo, to wander around freely and marvel at the opulence of the hacienda.

In this fantasy land, stimulated and fired by deeply ingrained megalomania, "The King of Cocaine" entertained ministers, mischief makers, mobsters, models, movie stars, maestros, murderers, malcontents, malleable politicians and members of narco-mafia, with cocaine fuelled parties, during which Machiavellian schemes and malicious plans were hatched. The hacienda is reported to have been the epicentre, where many acts of inexplicable violence – drug trafficking, maiming, assassination, kidnapping, ransoming, bombing, extorting, beating and pumping bullets were planned – felons and thugs received tacit approval to run amok – following no predictable pattern.

Don Pablo was killed on 2 December 1993 by Colombian Government forces. After his death, ownership of Hacienda Napoles passed onto the Colombian Government, which donated many of the exotic animals to zoos. Unattended to and uncared for, by humans, some of the birds and animals perished due to starvation and lack of care.

The quartet of hippos, a male and three females – subsequently dubbed the "cocaine hippos"- which the "narcotraficante" had imported from a US Zoo, were allowed to remain in the sprawling grounds of the ranch, as the herbivorous, semi aquatic behemoths were deemed to be logistically difficult, cumbersome and prohibitively expensive to maintain in Colombian zoos.

The passage of time and vagaries of nature transformed the hacienda's grandeur into desolation, in just seven years. In

2000, the government transferred a major portion of the estate to a company to build an amusement park on the ruins of Pablo Escobar's Elysian oasis.(5)(6)(7)(8)(9)

Abruptly abandoned, the hippos began roaming Hacienda Nápoles and beyond. They formed a feral population in the artificial lakes of the property, and the Magdalena River, grunting, wallowing and eating to their heart's content. Over time, some of the animals began to venture away from the pond into nearby rivers and surrounding areas, and have since been spotted many miles away from the estate.

Hacienda Nápoles possesses all the distinctive features of an African game reserve: virgin and pristine, vast and mostly uninhabited acreages, strands of jungle interspersed among pastures, majestic Andes Mountains towering in the distance, and flocks of birds flying overhead. This verdant sanctuary, blessed with salubrious, warm and muggy weather, copious water in man- made lakes and ponds, no threat from predators, no competition from other herbivores and lush vegetation all around, made it a veritable hippopotami paradise.

The forsaken hippos, unrestrained by securing pens and with ideal climate to thrive in, multiplied and established dominance in other lakes up to hundreds of miles away. By 2007, the original foursome had multiplied to 16. Seven years later, in early 2014, the herd comprised of 40 hippopotamuses. By 2019 their number had grown to approximately one hundred individuals. In February 2022 There were 133 megaherbivores, and projections showed, the numbers cascading to 434 by 2030.(10)(11)

On 25 March, 2022, The Colombian Ministry of Environment and Sustainable Development declared the "cocaine hippos" as an introduced invasive species.

The declaration enabled the stakeholders of the National Environmental System (SINA) to decide on the management and control mechanisms for the humongous herbivorous herds. Hitherto, the responsibility had been with the concerned area departments to control the animals on their own.

The National government's resolution was formulated on an "invasion risk analysis" drawn up by the Alexander von Humboldt Institute and the Natural Sciences Institute of the

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National University, together with various scholars and experts.(12)

Presently the hippos occupy lakes, swamps and small tributaries of the Rio Magdalena wetlands and basin, with their current area of distribution measuring approximately 2000 square kilometers. It has been predicted by scientists, with the creatures multiplying annually at the rate 14.5%, their territorial ascendancy could potentially extend to 13,587km in the years to come. This is, considering that the northernmost sighting of the animal has been 370 km away from Hacienda Napoles, in the Mompos depression.

The Rio Magdalena Basin, not only accounts for 25% of Colombia's land surface but also comprises an area, in which more than 80% of the country's population of 52.19 million live. Lentic or still water ecosystems, known locally as "cienagas", provide networks of varying layers and strata with the main flow of the river, performing the role of wildlife reservoirs and modulating the hydrodynamics of the riparian system.

Since hippos eat endlessly all day, an individual can expel as much as 180 kg of faeces daily. Being semi aquatic in nature, it excretes in the water, causing the faecal mass to sink to the bottom. Bacteria decomposing and devouring the nutrients from the feculence, syphon from and deplete oxygen levels in the water to critically low levels. Microbial activity also causes an upsurge of carbon dioxide, methane, ammonium and hydrogen sulphide in the water – the last two potentially toxic to fish. The anoxic water is swept downstream to fish habitats, by torrential rains, during the wet season, causing hypoxia, resulting in large scale fish kill. Phosphate and nitrogen concentration in the water are significantly increased by the disagreeable trifecta of sedimentation mixed with hippo excreta and urine.

Additionally, the urine and faeces of the animal, in conjunction with the agitation of riverine sediments, significantly increase the phosphate and nitrogen concentration in the water.

Zoonotic diseases and parasites are associated with hippos due to their vulnerability to a wide spectrum of viral and bacterial ailments - brucellosis, tetanus, Rift Valley Fever, anthrax, trypanosomiasis, tuberculosis, blood and liver flukes, schistosomiasis, trichinosis, roundworms, salmonellosis, and ticks. There is a real danger that the "cocaine hippos" could pass these on to other vulnerable wildlife and domestic animals and ultimately, humans. (13)

Beleaguered by the prospect of the invasive hippos posing such high-risk potential both to the local population and livestock as well as to native wildlife such as the Antillean manatees and neotropical otters, Gorga's rice rat and indigenous species of fish, the Colombian authorities were forced into action.

In the early 1990s, the U.S. Department of Agriculture's (USDA) National Wildlife Research Centre had developed a contraceptive for deer called GonaCon. Seventy doses of the drug were donated by USDA to the Regional Autonomous Corporation of the Negro and Nare River Basins (CORNARE), for invasive hippo population control by immune-castration..

The decision to chemically sterilize the artiodactyls, rather than surgically castrate them, saved both money and time for the authorities - because castrating the third largest land mammal, after elephants and rhinos, is a herculean task, setting the state exchequer back by US\$ 7,000 per animal. Since the behemoths are crepuscular and nocturnal feeders, spending diurnal hours submerged in water or foraging on aqua flora, emerging only at dusk for terrestrial feeding, the invasive surgery has to be scheduled after dark - most of the hippo's reproductive organs being undescended and totally invisible from the outside.

Usually pole syringes, anaesthetic pistols, or guns are used to deliver the anaesthetic dose to the area caudal to the ear or the medial and caudal aspects of the hind leg for adult animals. Elsewhere, the compact subcutaneous tissue and fat of 5-6 centimetres thickness hamper darting and resultant diffusion of the drug. In sub adult or juvenile hippos, other sites are used for injection.

To penetrate the 5 cm thick skin and the fat layer, long, reinforced, non-barbed needles of 60 to 100 millimetres length are recommended. Each procedure requires a minimum of 8-10 people.

Another challenge of anaesthetizing hippos is the high mortality rate due to hypopnea or apnea, bradycardia, and hyper-thermia. There have been instances of hippos, after

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being jabbed, and before the anaesthetic could take effect, running into their watery refuge, falling unconscious and dying by drowning.

In spite of the various challenges, the pilot project was successful in immune-sterilizing 24 hippos till date with GonaCon.

However the situation is still complex and uncertain, since experts suggest giving three doses, based on studies and comparisons made in other large animals such as horses, deer and cattle. It has been suggested by researchers, a minimum of thirty hippos be neutered annually, half of them female, if the emasculation programme is to have meaningful effect on the management of hippo numbers.

According to scientists, the worst-case scenario would occur if the chemical emasculation strategies, to manage the hippo population, are unsuccessful in the long term - the population will continue positively growing, with potential ecologic and socio-economic long-lasting negative effects leading the to colonize the northern portion of Colombia in the next decades facilitated by climate change conditions.

Should this happen, the only avenue open to the authorities will be herd culling, which would make available hippopotamus hides for processing to the Colombian leather industry. (14)(15)(16)(17)

Hippopotamus hide is a rare raw material in the leather industry, periodically available from legally harvested animals under strictly regulated governmental supervision, compliant with CITES(Convention on International Trade in Endangered Species of Wild Fauna and Flora) requirements.

Hippo leather is said to resemble elephant leather in all but one salient aspect. Since the artiodactyls are semi-aquatic in nature, their skin surface is characterized by a compact, barely perceptible, fuzzy-frizzy hair like nap, over its distinctive grain pattern which resembles cracked soil, on parched land or dried water body. This is due to the presence of sub-dermal glands which produce a viscous discharge to keep the animal cool.

Since the animal spends appreciable time in water, parasitic damage as well as thorns and bramble scars are prominent on the skin. The greyish brown raw hide is in excess of 5 cm thick

on the flanks but thinner elsewhere. The belly is light brownish pink in colour.

The final substance of hippo leather is adjusted to about 1.5-2.2mm. Due to its thickness, this exotic leather is particularly durable if made into shoes, suitcases and watch straps. Neutral colours are preferred by tanners on account of the unique integument. Hippo leathers are received deeply scarred, most of the time. Manual sanding or through feed buffing of the skin are important to equilibrate the uneven surface by eliminating the outermost layer, and impart a semblance of uniformity to the optic.

Shoemakers prefer to leave the top grain layer intentionally rough to make durable, hard-wearing boots. For other products, only the flesh layer of hippo leather is used. Courtney Boot Company, Bulawayo, Zimbabwe are world renowned for their hippo safari boots.

Hippo leather is mostly used for accessories. Countries permitting hippo harvesting export hippo leather bags, watch straps, tablet/smartphone covers, suitcases, work gloves, belts and holsters.

The advantages of hippo leather are its exotic grain, an inimitable striated optic, softness and appreciable volume, durability, natural water-resistance, smooth and velvety touch, resiliency, robustness and a compact, downy and velvety handle like the peach fruit. (18)(19)(20)

In the event, commercial culling becomes necessary in Colombia, in the near future, a flourishing market for hippo products is located, only four hours flying distance away from Bogota, the Colombian capital. Between 2012-22, the USA imported, 1700 trophies, 4400 small leather products, 5700 skin panels and 9000 teeth – representing body parts of 3081 hippos harvested for legally, under CITES supervision, making it the single largest importer of hippo products in the world. In addition, a wide array of hippo leather accessories and merchandise.

According to CITES trade data, between 2009 and 2018, a total of 77,579 hippo specimens, such as ivory carvings, teeth, raw tusks and leather items, plus 36,133kg of hippo ivory from teeth, derived from an estimated minimum of 13,909 hippos,

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were imported globally for commercial trade, or as hunting trophies or for personal purposes. Other merchandise included hippo skulls and hippo skull table, hippo ivory-handled knives, trinkets made from carved teeth, hippo leather purses, belts, and boots, hippopotamus-skin boots (21) (22)

There are, however, discrepancies in the CITES data. Research has, for example, revealed that Hong Kong recorded that it had imported more than 14,000kg of hippo teeth from Uganda than were reportedly exported from Uganda between 1995 and 2013. This strongly suggests that ivory from poached hippos is being laundered into legal trade.(23)

These considerations aside, since the invasive "cocaine hippos" of Colombia come from a micro-miniscule gene pool, in may be several generations later that the ill-effects of such narrow inbreeding and deleterious alleles begin to be noticed and culling becomes necessary.

Colombia has a vibrant leather industry with a rich heritage, going back several centuries. will be fully capable to harnessing its hippo wealth and marketing hippo leather and merchandise.

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The Transformative Power of Servant Leadership in the Corporate Sector

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Introduction

Servant leadership, a concept popularized by Robert K. Greenleaf in the 1970s, has gained increasing recognition and application in the corporate sector. This management philosophy focuses on leaders serving their teams, emphasizing empathy, collaboration, and the development of individuals to create a thriving organizational culture. In this article, we explore the application of servant management in the corporate sector, examining its principles, benefits, and real-world success stories.

Principles of Servant Management

1. Servant Heart :

- At the core of servant management is the leader's commitment to serving others.
- This involves putting the needs of employees and the organization ahead of personal ambitions, fostering a selfless and inclusive approach to leadership.

2. Listening and Empathy :

- Servant leaders actively listen to their team members, understanding their concerns and perspectives.
- By practicing empathy, leaders can create a supportive work environment and build stronger relationships within the organization.

3. Healing and Growth :

- Servant management emphasizes the holistic development of individuals.
- Leaders strive to heal and support their team members in times of challenge, promoting personal and professional growth for everyone in the organization.

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4. Awareness and Persuasion :

- A servant leader is self-aware and capable of persuading others through a gentle, non-coercive approach.
- This principle encourages leaders to make informed decisions while respecting the opinions and ideas of their team members.

5. Conceptualization and Foresight :

- Servant leaders possess a forward-thinking mindset, focusing on long-term goals and the well-being of the organization.
- They engage in strategic planning and encourage their teams to think beyond immediate challenges.

6. Stewardship :

- Leaders in a servant management framework view themselves as stewards of the organization.
- They are responsible for its success and the well-being of its members, fostering a sense of collective ownership among team members.

Benefits of Servant Management in the Corporate Sector

1. Improved Employee Engagement :

- Servant leaders prioritize the needs of their team members, creating a positive work environment that fosters trust and loyalty.
- This, in turn, leads to increased employee engagement and a more committed workforce.







2. Enhanced Creativity and Innovation :

- By promoting an atmosphere of open communication and collaboration, servant management encourages the free flow of ideas.
- This results in a more creative and innovative workplace, where team members feel empowered to contribute their unique perspectives.

3. Higher Employee Satisfaction :

- The focus on employee well-being and development contributes to higher levels of job satisfaction.
- Servant leaders recognize and appreciate the efforts of their team, creating a culture where employees feel valued and motivated.

4. Greater Organizational Resilience :

- Servant leaders build resilient organizations by fostering a sense of community and support.
- In times of change or adversity, teams led by servant managers are better equipped to adapt and overcome challenges.

5. Positive Organizational Culture :

- Servant management promotes a positive and inclusive organizational culture.
- This culture extends beyond the leader, influencing the entire workforce to adopt values of collaboration, respect, and continuous improvement.

Real-World Success Stories having perspective to Servant Management

1. Southwest Airlines :

- Herb Kelleher, co-founder of Southwest Airlines, is often cited as a servant leader.
- By prioritizing the well-being of employees and fostering a people-first culture, Kelleher contributed to the airline's success, making it a model for the industry.

2. Microsoft under Satya Nadella :

- Satya Nadella, the CEO of Microsoft, is known for his servant leadership approach.
- He transformed the company's culture by focusing on empathy, collaboration, and continuous learning, leading to increased innovation and organizational success.

3. The Container Store :

- The Container Store, led by CEO Kip Tindell, embraces servant leadership principles.
- By prioritizing employee development, maintaining a positive work environment, and emphasizing a stakeholder-centric approach, the company has achieved sustained success.

Advaidanta Vedanta and Its Influence of the Principle of Servant Management

Advaita Vedanta, is a philosophical and spiritual tradition within Hinduism that emphasizes the non-dual nature of reality. While the concept of servant leadership is not explicitly mentioned in traditional Advaita Vedanta texts, there are certain philosophical principles and teachings that align with the values associated with servant leadership.

- 1. Non-Duality (Advaita) : At the core of Advaita Vedanta is the principle of non-duality, asserting that there is only one ultimate reality, often referred to as Brahman. This concept resonates with the idea of servant leadership, where leaders recognize the interconnectedness of all beings and work for the common good rather than pursuing self-interest.
- 2. Selflessness (Nishkama Karma) : Advaita Vedanta encourages the practice of selfless action, known as Nishkama Karma. This aligns with the servant leadership principle of putting the needs of others first. Leaders in the servant leadership model are expected to serve without attachment to personal gain, and Nishkama Karma reflects a similar attitude toward actions in the Advaita Vedanta tradition.



- 3. Compassion and Empathy: The teachings of Advaita Vedanta emphasize the cultivation of virtues such as compassion and empathy. Servant leadership, with its focus on understanding and addressing the needs of others, resonates with the idea of approaching leadership with a compassionate and empathetic mindset.
- 4. Detachment (Vairagya) : Advaita Vedanta encourages detachment from the material world and a focus on the eternal, unchanging reality. Servant leadership, while active and engaged, also advocates a certain level of detachment from personal ego and material pursuits. This aligns with the idea that a servant leader operates from a sense of humility and selflessness.
- 5. Serving the Whole (Vasudhaiva Kutumbakam) : The ancient Indian principle of "Vasudhaiva Kutumbakam" translates to "the world is one family." While not exclusive to Advaita Vedanta, this idea aligns with the interconnectedness emphasized in non-dual philosophy. Servant leadership, with its focus on serving the common good, resonates with the ethos of considering all of humanity as one family.

It is important to note that while these principles from Advaita Vedanta may align with certain aspects of servant leadership, the concept of servant leadership itself is a modern organizational and leadership philosophy that has evolved in the context of contemporary management practices. The direct reference to servant leadership as a concept may not be found in traditional Advaita Vedanta texts, but the philosophical underpinnings share some common ground with the principles of servant leadership.

Teachings of Swami Vivekananda on Servant Management

Swami Vivekananda had provided valuable insights into various aspects of life, leadership, and service. While the term "servant leadership" wasn't explicitly used during his time, Swami Vivekananda's teachings are deeply rooted in the principles that align with servant leadership. Here are some key messages from Swami Vivekananda that reflect the essence of servant leadership :

1. Service to Humanity: Swami Vivekananda emphasized the idea of serving humanity as a form of worship. He believed that true leadership lies in selfless service to others. His teachings encourage individuals to see the divine in every being and to dedicate their lives to the welfare of others.

"They alone live who live for others; the rest are more dead than alive."

2. Leadership through Example: Swami Vivekananda advocated leading by example. True leaders, in his view, are those who demonstrate the qualities they expect from others. This aligns with the servant leadership principle of modeling the behavior and values one wishes to see in their team.

"The greatest leader is not necessarily the one who does the greatest things. He is the one that gets the people to do the greatest things."

3. Empowering Others: Swami Vivekananda believed in empowering individuals to realize their inherent potential. Servant leaders share a similar vision of supporting and uplifting their team members, enabling them to achieve personal and professional growth.

"The best thermometer to the progress of a nation is its treatment of its women."

4. Compassion and Empathy: Compassion and empathy were central to Swami Vivekananda's teachings. He urged individuals to understand the struggles of others and to respond with kindness. These qualities are fundamental to servant leadership, where leaders seek to understand and address the needs of their team members.

"They alone live who live for others; the rest are more dead than alive."

5. Selfless Action (Nishkama Karma): Swami Vivekananda emphasized the concept of Nishkama Karma, or selfless action. He believed in performing duties without attachment to personal gains. Servant leadership echoes this sentiment, promoting leaders who focus on the well-being of others rather than pursuing self-interest.

"You have to grow from the inside out. None can teach you; none can make you spiritual. There is no other teacher but your own soul."

6. Unity in Diversity: Swami Vivekananda celebrated the diversity of humanity while recognizing the underlying unity. Servant leaders embrace diversity and foster an



inclusive environment, acknowledging the unique strengths each individual brings to the team.

"Sectarianism, bigotry, and its horrible descendant, fanaticism, have long possessed this beautiful earth. They have filled the earth with violence, drenched it often and often with human blood, destroyed civilization, and sent whole nations to despair."

Swami Vivekananda's messages on service, leadership, and compassion resonate strongly with the principles of servant leadership. His teachings continue to inspire leaders worldwide to adopt a selfless and inclusive approach to leadership for the betterment of society as a whole.

Sri Ramakrishna and HIS Message on Servant management :

Sri Ramakrishna, the one of the greatest spiritual reformer, is renowned for his teachings on the universality of religion and the realization of God through various paths. While the term "Servant Management" might be a modern organizational concept, his teachings contain profound insights that resonate with principles of selfless service, humility, and compassion core tenets of servant leadership. Here's an interpretation of what Sri Ramakrishna's teachings might convey in the context of modern Servant Management :

1. Selfless Service (Nishkama Karma) :

• Sri Ramakrishna often emphasized the concept of Nishkama Karma, selfless action without attachment to the fruits of one's labor. In the context of modern Servant Management, leaders can adopt a similar approach, focusing on serving their teams and the organization without being driven solely by personal gain or recognition.

2. Humility and Leadership :

 Sri Ramakrishna's teachings highlight the importance of humility, considering oneself as the servant of all. Modern servant leaders can embrace humility, recognizing the contributions of every team member and acknowledging that leadership is a form of service to the collective goals of the organization.

3. Compassion and Understanding :

 Compassion was central to Sri Ramakrishna's teachings. In the workplace, a servant leader can embody compassion by understanding the needs, challenges, and aspirations of team members. This empathetic approach fosters a supportive environment and enhances the well-being of individuals within the organization.

4. Diversity and Inclusivity :

 Sri Ramakrishna's teachings encompassed the idea of recognizing the divine in all beings, transcending religious and social boundaries. In the context of Servant Management, leaders can promote diversity and inclusivity, acknowledging the unique strengths each individual brings to the team.

5. Balancing Material and Spiritual Aspects :

• While actively engaged in the world, Sri Ramakrishna also stressed the importance of maintaining a connection with the spiritual dimension. Modern servant leaders can integrate this idea by encouraging a balanced approach to work, promoting employee well-being, and fostering a culture that values both professional and personal growth.

6. Lead by Example :

• Sri Ramakrishna often said that a spiritual teacher must be sincere and practice what they preach. Similarly, a servant leader should lead by example, embodying the values they advocate for in the workplace. This fosters trust and respect among team members.

7. Encouraging Individual Growth :

• Sri Ramakrishna's teachings encompassed the idea of helping individuals grow spiritually. In a modern organizational context, servant leaders can encourage the personal and professional development of their team members, fostering an environment where everyone can reach their full potential.





In summary, Sri Ramakrishna's teachings provide a spiritual foundation for principles that align with modern Servant Management. The emphasis on selfless service, humility, compassion, diversity, and leading by example can inspire leaders to create workplaces that are not only successful but also nurturing and fulfilling for all members of the organization.

However, as of that time, the influence of Advaita Vedanta's principles on servant management was not widespread in mainstream corporate practices. Nevertheless, the ideas of selfless service, empathy, and holistic well-being have gained recognition and adoption in various leadership and management approaches.

Here are some ways in which Advaita Vedanta's principles might align with modern attitudes towards servant management :

- 1. Mindfulness and Well-being :
 - The emphasis on holistic well-being and self-awareness in Advaita Vedanta resonates with modern approaches that prioritize employee mindfulness, mental health, and overall well-being. Companies that recognize the importance of caring for their employees' mental and emotional states often see increased job satisfaction and productivity.

2. Ethical Leadership :

• The principles of non-duality and interconnectedness in Advaita Vedanta may align with the growing emphasis on ethical leadership in the modern business world. Servant management, with its focus on serving the greater good and considering the impact of decisions on all stakeholders, aligns with the ethical considerations advocated by Advaita Vedanta.

3. Inclusive Leadership :

• The idea of the world as one family (Vasudhaiva Kutumbakam) in Indian philosophy aligns with modern notions of inclusive leadership. In servant management, leaders strive to create inclusive environments that value diversity and treat all individuals with respect, irrespective of their backgrounds or roles.

4. Corporate Social Responsibility (CSR) :

 Advaita Vedanta's emphasis on service and stewardship may find echoes in the growing trend of Corporate Social Responsibility (CSR). Many companies are recognizing the importance of giving back to society, contributing to environmental sustainability, and addressing social issues, aligning with the broader sense of responsibility and service.

5. Employee Engagement and Empowerment :

• The idea of servant leadership aligns with modern approaches to employee engagement and empowerment. Companies that empower their employees, involve them in decision-making processes, and provide opportunities for growth are likely to see increased loyalty and commitment, as emphasized in the principles of servant management.

6. Collaborative and Adaptive Cultures :

• The adaptability and conceptualization principles of servant leadership align with the modern need for organizations to be agile and responsive to change. Servant management encourages a collaborative culture where all members contribute to problem-solving and decision-making, fostering a more adaptive and resilient organization.

While the direct influence of Advaita Vedanta's theories may not be explicitly acknowledged in corporate settings, the underlying principles of interconnectedness, ethical conduct, and service to others find resonance in contemporary approaches to leadership and management. As societal and corporate values evolve, there is potential for an increased appreciation of these philosophical principles in the context of achieving long-term success and sustainable business practices.

Advaita Vedanta, the philosophical system within Hinduism, offers profound teachings that can be applied to various aspects of life, including the corporate world. While it may not be a direct guide to corporate success, the principles of Advaita Vedanta can inspire a holistic approach to leadership, interpersonal relationships, and ethical business practices. Here are some teachings of Advaita Vedanta and their potential relevance to corporate success :



1. Non-Dualistic Perspective :

- **Teaching**: Advaita Vedanta emphasizes the oneness of the ultimate reality (Brahman) and the interconnectedness of all beings.
- Application : In a corporate context, recognizing the interconnectedness of employees, stakeholders, and the larger community fosters a sense of unity. This interconnected perspective can lead to collaborative decision-making, a focus on shared goals, and a deeper understanding of the impact of business decisions.

2. Nishkama Karma (Selfless Action) :

- **Teaching**: Advaita Vedanta encourages performing duties without attachment to personal gain, known as Nishkama Karma.
- Application : Leaders practicing selfless action are likely to prioritize the well-being of their teams and the organization over personal interests. This can lead to a positive work culture, increased employee loyalty, and a focus on the greater good.

3. Detachment and Equanimity :

- **Teaching :** Detachment from the fruits of actions and maintaining equanimity in success and failure are key aspects of Advaita Vedanta.
- **Application** : In the corporate world, leaders who can maintain composure during challenges and success are better equipped to make sound decisions. Detachment from personal ego can foster a more resilient and adaptable organization.

4. Viveka (Discrimination) :

- **Teaching**: Advaita Vedanta encourages discernment (viveka) between the eternal and the transient.
- **Application**: Leaders can apply discernment in decisionmaking, distinguishing between short-term gains and long-term sustainability. This can lead to ethical business practices, responsible decision-making, and a focus on the enduring values of the organization.

5. Ahimsa (Non-violence) :

- **Teaching** : Ahimsa, or non-violence, is a fundamental principle in Advaita Vedanta.
- Application : In a corporate setting, this translates to ethical business practices, respect for diversity, and a commitment to social and environmental responsibility. Leaders who promote a culture of non-violence contribute to a positive workplace environment.

6. Self-Realization and Personal Growth :

- **Teaching** : Advaita Vedanta encourages self-realization and personal growth on a spiritual level.
- **Application :** In the corporate world, fostering an environment that supports employees' personal and professional growth leads to a more motivated and engaged workforce. Encouraging continuous learning and development aligns with the principles of self-realization.

7. Atma-Gyana (Knowledge of the Self) :

- **Teaching** : Advaita Vedanta teaches the importance of realizing the true nature of the self.
- **Application**: Leaders who cultivate self-awareness and promote a culture of introspection contribute to a workplace where individuals are more aligned with their core values. This can lead to greater job satisfaction and a sense of purpose.

While not a blueprint for corporate success, the teachings of Advaita Vedanta offer valuable insights into leadership, ethical conduct, and fostering a positive work culture. Integrating these principles can contribute to a more holistic and sustainable approach to corporate success. It's important for leaders to adapt these teachings in a way that aligns with the specific values and objectives of their organizations.

Positive Impact of Servant Management

Servant management, with its emphasis on empathy, collaboration, and the well-being of employees, has the potential to significantly reduce stress in the workplace. Here's how the



1. Open Communication :

- Servant Management Approach : Servant leaders encourage open and transparent communication.
- Stress Reduction : Clear and open communication helps in avoiding misunderstandings and conflicts. When employees feel heard and understood, it reduces stress associated with uncertainty or lack of information.

2. Empathy and Support :

- Servant Management Approach : Servant leaders prioritize understanding the needs and concerns of their team members.
- Stress Reduction : Knowing that their leaders genuinely care about their well-being and are ready to provide support in times of stress or difficulty can significantly reduce the emotional burden on employees.

3. Work-Life Balance :

- Servant Management Approach : Servant leaders often emphasize the importance of work-life balance and the overall well-being of employees.
- Stress Reduction : A balanced approach to work and personal life helps in preventing burnout and stress-related health issues. Employees who feel supported in maintaining this balance are likely to experience less stress.

4. Recognition and Appreciation :

- Servant Management Approach : Servant leaders recognize and appreciate the contributions of their team members.
- Stress Reduction : Feeling valued and appreciated at work contributes to job satisfaction and reduces stress. Employees are more likely to be motivated and engaged when their efforts are acknowledged.

5. Autonomy and Decision-Making :

• Servant Management Approach : Servant leaders empower their team members and involve them in decision-making processes.

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• Stress Reduction : Having a sense of control and autonomy in one's work can reduce stress. When employees are given the opportunity to contribute ideas and have a say in decisions that affect them, it fosters a positive and less stressful work environment.

6. Conflict Resolution :

- Servant Management Approach: Servant leaders address conflicts promptly and work towards resolution.
- Stress Reduction: Dealing with conflicts in a timely and constructive manner prevents the escalation of tension and stress within the team. Employees feel supported when leaders actively work towards resolving interpersonal issues.

7. Continuous Learning and Development :

- Servant Management Approach : Servant leaders encourage the personal and professional development of their team members.
- Stress Reduction : Providing opportunities for learning and growth helps employees build their skills and confidence. Feeling stagnant or stuck in one's career can be a significant source of stress, and a commitment to ongoing development can alleviate this pressure.

8. Stewardship Mentality :

- Servant Management Approach : Servant leaders view themselves as stewards of the organization, responsible for its success and the well-being of its members.
- Stress Reduction : When leaders prioritize the overall health and success of the organization rather than personal gain, it fosters a sense of collective responsibility. This shared responsibility can alleviate the stress associated with individual performance pressures.





Conclusion

The application of servant management in the corporate sector represents a paradigm shift from traditional authoritarian leadership styles. As organizations recognize the value of prioritizing the well-being and development of their employees, servant leadership continues to gain prominence. By fostering a culture of collaboration, empathy, and continuous improvement, servant management has the potential to create not only successful businesses but also fulfilling and sustainable workplaces. As the corporate landscape evolves, embracing servant leadership principles may well be the key to unlocking the full potential of individuals and organizations alike.

In summary, the servant management approach contributes to stress reduction by fostering a positive and supportive workplace culture. By prioritizing the needs of employees, promoting open communication, and creating an environment of trust and appreciation, servant leaders can help alleviate stress and contribute to the overall well-being of their teams.

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- Explore case studies from successful companies known for implementing servant leadership, such as Southwest Airlines, The Container Store, and others.
- Journals focused on organizational development often feature articles on servant leadership and its impact on corporate culture and success.
- Books on leadership and management by reputable authors may include sections or chapters on servant leadership.





Down Memory Lane _____

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PERSPECTIVE

Some Thoughts On The Rationalisation Of Indian Leather Industry

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It seems that the global leather industry and the leather trade are at present passing through a transitional period. Though the developed countries are the principal importers of raw hides and skins and exporters of finished leathers and leather goods uptil now, the present trend indicates that after 1990 the roles of developed countries may be played by the developing countries After 1990 the developed world will perhaps be the main exporter of raw hides and skins and importer of finished leathers and leather products.

It has been reported that large number of tannerics and leather products units of different developed countries have already been closed down for pollution problems, high labour cost and scarcity of raw hides and skins whose supply remained inelastic in nature. The recent study made by different U. N. experts reveals that many more tanneries, footwear and leather goods units of developed countries will be forced to cease their production. The picture, on the other hand, is quite opposite in the developing world. New modern tanneries and leather products units, big and small, under collaboration with the experienced organizations of developed countries are coming up very rapidly in this developing region. The United Nations also endorsed the "Lima Declaration and Plan of Action on Industrial Development" adopted at the Second General Conference of UNIDO, held In Peru, March 1975, that the "developing countries' share of world industrial production should be increased from its present level of around 7 per cent to at least 25 per cent by the year 2000".

As far as leather industry is concerned, the forecast of the United Nations' exports for global leather production during the period 1975_2000 is clearly pictured in the following graphic djagrams:

ported machines, leather chemicals and auxiliaries. State Government owned Leather Development Corporations, with modern up to date facilities, have been set up in different Indian states and have been functioning as servicing centres for small tanners who cannot afford to instal costly modern machines in their own factories. Due to such modernization of factories and use of modern leather chemicals the qualities of the Indian finished leathers have appreciably gone up. But unfortunately the leather export in volume has not improved. Moreover, most of the leather development corporations and modern tanneries of India are running at Government losses. subsides allowed to leather export sector is



1975 1980 1985 1990 1995 2000 1975 1980 1985 1990 1995 2000

Careful study reveals that similar wind is blowing in Indian leather industry also. During the last decade many old tanneries in India were modernized with imdefinitely a temporary measure because no industry can survive as a sick industry depending on Government help. The leather industry

of India has to stand on her own

Export figures in billion ft² per annum

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test and earn much needed foreign exchange for the country. A thorough and careful study for such lesses in the leather industry must, therefore, be made with open mind.

The Livestock Population

The condition of leather industry of a country does not depend on her livestock population. The fivestock population of the developing world, as for example, is always higher than that of the developed world but the developing countries produce less number of hides than the developed countries due to lower offiake rate of the latter. In 1977 the livestocks of the world were roughly as follows :

Livestock Population

(In million number) 1977

Production of Hides and Skins

		(Mill	ion pcs)
	1977		
	Bovine	Sheep	Goat
Developing world	129.6	183.2	153.5
world	156.1	200.5	13.5
Total	285.7	383.7	167.0

In the same year India produced roughly 29.0 million pieces of bovine hides, 23.0 million pieces of sheep skins and 36.0 million pieces of goat skins.

As far as bovine hide supply is concerned, the position of the developing countries in the world is more unfavourable when comparison is made on the basis of hide weight or hide area, because the average cattle of the developing countries are smaller in size and weight than the average cattle of the developed countries. This will be clearly understood from the following table and the Pie-diagram.

Production of Hides and Skins in weight and area

	1977		
	Bovine	Sheep	Goat
Developing countries			
Number of hides and skins in			
million pieces	. 129.6	183.2	153.5
Total weight in million tons _	. 2.1	0.1158	0.1165
Total area in million ft*	. 3369,3	1284.5	770.7

Developed countries

Number of hides and skins

n m.	llion	110000	
1. 1111	11.117.11	1410000	

CALLER AND			
Total weight in million tons	3,106	0.1927	0.0106

156.1

200.5

13.5



15

Bovine Sheep Goat Developing countries 862.0 451.0 434.0 Developed countries 439.0 506.0 23.0 Total 1,301.0 957.0 457.0

In the same year the livestock position of India was recorded as follows ;

Bovine 241 million, sheep 40.0 million and goat 70.0 million. Thus India's share in developing countries was only 27.95% bovine, \$86% sheep and 16.13% goat.

Production of Raw Hides and Skins

The position is quite different regarding production of raw hides and skins as will be seen from the table on next column.

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In bovine hide supply Indias' outlook among the developing countries is not at all bright, because out of 29.0 million bovine hides collected in India in 1977 nearly 13.41 million came from fallen calves of less than I year of age and so they were too small in area and weight to be considered as hides. Moreover, 90 to 95 per cent bovine hides of India (including calf skins) are collected from fallen animals and so they are very poor in quality. Out of 29 million hides collected. nearly 17.2 million are so inferior in quality that it is not at all economical to process them in the tanneries. So these 17.2 million bovine hides (60% of total collected hides) are processed by vilage chamars by crude vegetable tanning method with locally available tanstuffs and their products are used for the manufacture of cheap quality village-type shoes for poor farmers of India. Naturally, 11.8 million or 12.0 (rounded up) million hides out of 29.0 million come to tanneries for processing.

The goat and sheep skins of India are good in quality because most of them are collected from slaughtered goats and sheep, but they are smaller in size when compared with the skins of the developed countries. Though for glazed kid, gloves, suede and other types of fancy leathers Indian skins are quite suitable, these are not so for the manufacture of garment leathers for which skins of greater surface area are required. India produces nearly 59 million pieces of skins, no doubt, but the major raw material for the leather industry is the bovine hides which represent 70 to 80 per cent of leather in area of the world as shown in the following table.

It may be mentioned that 498million ft² of leather produced in 1977 from pig skins have not been included in the above table.

Thus, for the development of leather industry of India casy and sufficient supply of bovine hides of good quality are the pre-requisites.

Tanning Activity

Since the export of raw hides and skins is banned in India. the entire 12 million pieces of hides are tanned annually in the tanneries. and only a part of it is finished upto the useable stage. Out of this 12 million pieces of raw bovine hides only 3 million pieces are of good quality and can be used for exportable leathers. It is assumed that the average area of an Indian bovine hide is nearly 20 ft2 and, therefore, these 3 million hides produce only 60 million ft* of exportable leather. Actually India has been exporting roughly 60 million fts of leather, produced from cattle hides, annually for the last several years. This 60 million ft[#] of leather is also not exported smoothly, otherwise arrangements for Lexpo, Leather Fairs, Tanners' Get-Together etc would not have been required to attract the foreign buyers. In fact, the above-mentioned 3 million pieces of good quality Indian hides are also not first grade hides, according to International Standard, However, some push in the export market

always becomes necessary. Had there been no modernization of a few tanneries in India, her total volume of leather export would have been unbelievably low today. Though the introduction of modern chemicals, machines, adoption of improved technical know-how etc. have helped India to retain her export figure of 60 million ft¹ of hide leathers the volume of export has not increased. Improvement in the quality of leather due to such modernization has certain limitations from the export point of view and therefore, exportable leathers cannot be manufactured from lower grade raw hides even though the sale value of such leather goes up due to modern methods of processing. Due to modernization of tanning processes nearly 2 to 2.5 million pieces of second grade hides, which could not be exported as leather or leather products before, were used for production of footwear and exported, India now exports 15 to 16 million pairs of leather footwear annually for this reason. For the same reason, the export of leather goods, other than footwears, have gone up slightly. At present India exports annually 3 million pieces of hides in the form of 60 million ft^a of leather and 2.5 million pieces of hides or 50 million fe2 of leather in the form of leather products totalling 5.5 million pieces of hides=110 million ft2 of leather. The exportable leathers produced from skins have not been included here.

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Down Memory Lane



Modernization of tanneries increases the cost of production of leather appreciably. The cost of one multiwidth hydraulically operated shaving machine today, as for example, is nearly 6 lakhs of rupees. If the depreciation, bank interest, salary of the operators, cost of power, cost of spare parts, cost of maintenance etc for that machine are added the running cost for it would come to 2 lakhs of rupees per year. The shaving cost of one hide in India today is nearly Re. 1.00 and therefore one such machine should shave at least 800 to 850 hides daily for 300 days in a year to avoid a loss at the end of the year.

With the present condition of raw hide supply in India export of leather (from hide) cannot be increased beyond the above mentioned 110 million ft^s limit for want of good quality raw hides. On the other hand the price of leather in the home market will shoot up if the remaining 6.5 or 7 million pieces of third and lower grade hides which are processed in old fashioned tanneries equipped with indigenous machines for internal consumption, are processed in modernised tanneries with imported modern leather auxiliaries, as the final leathers will not rise to the exportable standard due to poor raw material. For this reason small tanners in India do not show interest for well equipped servicing centres which are practically starving for want of sufficient job.

Import of Raw Hides

It may appear that import of raw hides from the developed countries, as proposed, can solve India's problem but in reality the case is not so simple. India must search for the

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reasons first as to why the percapita leather and leather footwear consumption in the developed countries are gradually going down year after year. The average per capita leather shoe consumption of developed countries (excluding the centrally planned Economies) was 2.2 in 1952 but it came down to 1.79 in 1973 and to 1.73 in 1974. It may be due to high price of leather shoes. The price of leather shoe has constantly gone up during the last several years and, at present, it has practically touched the marginal utility value. For this reason, the common people of the developed countries are slowly switching over from leather shoes to synthetic leather footwears. In the field of leather goods also the synthetic materials are steadily entering in.

It is generally felt that the high labour cost in the developed countries has pushed up the prices of leather footwears and leather goods and so these products should be manufactured in the developing countries where labour is very cheap. It is true that labour is cheap in the developing countries but it should also be taken into account that the efficiency of workers in the developing countries is unbelievebly low compared with the efficiency of workers of the developed countries. If the labour cost is calculated on the basis of output worker, then it will be found that the labour costs as between developed and developing countries do not vary too widely. Moreover, the labour cost in modern footwear factories of the developed countries represents only 10 to 15 per cent of the total cost of production and so it cannot be responsible for the sky-touching prices of leather footwear and leather goods. The following table shows the break-up of costs of production of a pair of best quality leather shoe in USA in 1977.

Cost of Production of a Pair of Best Quality All Leather Shoe in U.S.A. in 1977

	-	S	% of production cost
1.	Cost of leather	7.86	44.18
2.	Other materials	1.02	5.73
3.	Direct labour (1.0 to 3.4 \$)	2.20	12.30
4.	Factory overhead	1.49	8.37
5,	Office overhead (including sales expenses)	3,49	19.62
6,	Profit	1.73	9.80
-	Total \$	17,79	(

From the above costing it is clear that the high price of leather footwear in U.S.A. is mainly due to high price of leather and heavy office everhead expenses. As the price of leather products increases, the advertisement expenses also goes up, in order to keep the sale to the same level. Naturally, the office overhead will come down if the prices of leather products are brought down by lowering the price of leather. But why the price of leather has gone up so high today 7 What the costing of a tannery has to say about it ?

The average manufacturing cost of corrected grain upper leather in





developed countries as published by UNIDO can be summarized as below :

Item	% of total production cost
I. Rent	0.1
2. Building maintenanc	e 0.4
3. Machine and plant	0.7
4. Depreciation	3.1
5. Interest on capital	8.5
6. Chemicals	14.3
7. Management	4.5
8. Labour	4.1
9. Fuel	1.5
10. Electricity	1.1
11. Water	0,9
12. Effluent	0,3
13. Office expenses	1.1
14. Sales	. 0,3
15. Packing	0.2
16. Freight	0.1
17. Sales commission	1.6
18. Other expenses	0.8
19. Raw hides	56,4
Total	100.0

From the above table it is clear that the high price of leather is mainly due to the high price of raw hides which represents 56,4 per cent of the total production cost of leather. Unless the supply of raw hides and skins in the world tanneries is increased, it is practically impossible to reduce the rate of price rise for leather in the world market. The slaughtering rate in the developed countries being already too high, further increase in the supply of raw hides and skins of developed countries will not help the situation. The

volume of imports of raw hides and skins of the developed countries is also gradually going down due to imposition of restrictions on export of these materials by the Governments of developing countries. The possibility of increased raw hide supply of International standard should, however, be explored in the developing countries only.

Unfortunately the raw hide supply position of the developing countries is worse than that of the developed countries. Though the developing countries produce 45.36 per cent bovine hides of total world supply in pieces or 37.87 per cent in hide surface area, in actual practice however, the supply is much less because a good part of these are below the required international standard.

As regards India's position in the world raw hide supply since her bovine livestock is 18,52 per cent of the world livestock, "her raw hide contribution to the world should also be 18.52 per cent of the world raw hide supply, but she produces only 10.15 per cent hide of the world. The percentage of Indian hides which can hardly meet International standard is only 1.75 or less. Thus, in India there is acute shortage of hides to run the leather export business for earning foreign exchange for the Nation, All attempts made in the past both in the Government and private levels to improve India's leather export were of no avail for want of adequate supply of high grade raw bovine hides to tanneries, India had been satisfied with the increased amount of foreign exchange in terms of value from leather exports year after year due to price rise of leather in the world market but her

exports have not increased in quantum in most of the cases.

But a change in the situation is in the offing because raw hides from the developed countries have started flowing to the developing countries where modern, well equipped tanneries are coming up very fast. Advanced technical knowhow is also easily available now from the developed world. To compete in the world leather market in future. India must organize her leather industry right from now. But how to do that ? Should India also import huge quantities of raw hides. latest leather auxiliaries, sophisticated machines, advanced technical know-how from the developed countries and export the finished products and ultimately run her leather industry at will of the developed world ?

Such attempts will definitely be a risky adventure. When large number of modern tanneries will be set up in different developing countries, the demand for high grade raw hides will be so high that the developed countries may not be able to supply that. Consequently, the price of raw hides and leather will move up further lowering the per capita leather and leather foctwear consumption of the developed countries by one step more. In that situation the developing countries will not be able to sell their leather products in the home markets due to low per capita income of their people and so ultimately will have to accept the terms offered by the developed countries.

The extra freight necessary to import raw hides and leather auxiliaries from the developed countries will add fuel to the fire. The

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modition will become more serious I the developed countries can find a leather like substitute by that time because extensive research is going on there for this substitute. If such a leather substitute is found the developed countries may send their hides to gelatine factories for the manufacture of edible gelatine for which there is huge demand and may stop importing bones from the developing countries. Then the developing countries will face more troubles than what the developed countries are facing today. What is the solution then ? The solution lies in the mutual co operation of both developed and developing countries and the developing countries must increase their supplies of first grade hides through improved and scientific animal husbandry.

India's Position

India stands on a different footing because unlike other developing countries the slaughtering of cattle is not favoured on religious ground and the 60 million stray cattle live here without contributing anything to the National income. Moreover, the cattle population of India being 241 million, most of them do not get the required amount of food to cat and get diseased very quickly, because the amount of cattle food which India produces annually can feed 100 million of cattle only.

Since these is no natural grassy land in India and the demand for milk is constantly increasing. India should eliminate her unproductive cattle population from 241 to 100 million high milking recognized cattle. This can be made possible if 30% cattle can be slaughtered annually to keep the cattle population constant at 100 million. By this arrangement the milk supply

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as well as the high grade hide supply of India can be increased appreciably.

It may be interesting to investigate as to why the Hindu community of India does not support slaughtering of cows but supports slaughtering of buffaloes who are a better source of milk than the cows.

Origin of Holy Mother Doctrine

From careful studies of Indian epics it will be clear that India was purely an agricultural country in ancient times. At the dawn of agricultural development the Indian farmers were searching for a special type of animal having the following characteristics for ploughing land.

 A well developed hump at the junction of the neck and back so that the yoke did not slip during ploughing of hard land.

 Long but strong legs so that the animal could move fast with sufficient load even in the muddy field.

 Low fat content but tight body so that the animal did not show any laziness to hard work.

 Sufficient resistance and stamina to fight against diseases and natural calamities.

 Well developed front or chest in comparison to the back side so that the animal had drastic forward movement.

 Easy adaptibility to common and easily available cattle food and agricultural roughages.

 Short hair throughout the body so that the animal could be kept clean easily after the work in muddy field.

All the above mentioned qualities were found in the wild species

"Bos Indicus" whom the Indians were hunting so long for food and clothing, and so the farmers of ancient India started domesticating this wild animal for agricultural purpose even though their milk giving power was very poor The present humped cattle of India, known as "Brahmins" are the descendents of wild "Bos Indicus". Even today the Indian farmers are not at all interested to replace their drought cattle with high milking dairy variety. This is a direct evidence that in India cattle was never reared for milk. It was reared for getting bulls for agricultural purpose. Then why these animals are considered as "holy mother" in India y

When the old farmers realized that the domestication of wild "Bos Indicus" in large number was necessary for agricultural purpose but did not find them in large number in the forests because of constant hunting for food they domesticated whatever number of this animal they could collect and tried to increase their number through rearing very rapidly. Naturally the farmers had to find out some means to protect them from killing for food. The social reformers of those days, therefore, declared these animals 'holy mother' and their slaughtering was binned. If cows were regarded as holy mother approved by Hindu religion, the Indian farmers and milkmen would not kill most of the female cattle calves at the age of 0-1 year by depriving them from their mothers" milk. To bring the supply and demand for bulls to the point of equilibrium, perhaps, several centuries passed by which time a strong hatred for beef-cating got deep rooted in the society. Any-

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way, this holy mother feeling is so strong today among a part of Hindu, that slaughtering of cow cannot be introduced in India by regulations.

Solution to problems

Since cattle is reared in India for getting bulls, the religious 'holy mother" 'feeling may gradually slow down if, like Japan, small wheel barrow type handy tractors are introduced into the agricultural fields. Farmers will then rear cattle not for getting bulls but for getting milk and so gradually the humped brahamin cattle will be replaced by recognized milk yielding cattle. And if there is a market for selling male calves of the age of 3 years, the farmers will then gladly allow the male calves to grow upto that age and sell them in the market where these male calves can be slaughtered with the development of meat processing and animal by-products industry. As a support to this idea it can be said that buffaloes are reared in India for milk and so most of the male buffalo calves are forced to die before they attain the age of 1 year because there is no well established market for purchasing the buffalo calves for meat processing. The numbers of male and female cows and buffaloes in India in the year 1980 are shown in the table below.

Cattle and Buffalo Population in India

	Figures in million numbers		
Sex	Cattle	Buffaloes.	
Male	99.32	16.92	
Female	81,68	43.08	
Total	181.00	60.00	

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In nature more or less the same number of male and female calves are born every year, but in livestock population such differences in male and female animals are found in India. The female calves of cattle and male culves of buffaloes are not so valuable to farmers and milkmen and so they are forced to die through starvation. Introduction of tractors and mechanization of agricultural industry will render the male calves of cattle less valuable to farmers who will then rear milch cows and sell the male calves at the age of three to the organizations who would be prepared to pay attractive values for them. Since the demand of milk has been more in the Urban area, the buffalo population of this area has been increasing very rapidly making more of he buffaloes available for slaughter in the India abattoirs. If the population of buffaloes increases this way in urban areas a day will come very soon when milkmen will kill mate buffalo calves in larger number in urban areas also. If organized, the cows can also play the same role as the buffaloes are playing today in the urban areas.

In this way if the supply of first grade bovine hides is increased, the leather industry of India will definitely take a new shape to give leadership to the developing countries so that this industry of developed and developing countries can survive like twin brothers. No country can support the idea that her industry should mainly depend upon the imported raw materials specially when there is bright possibility of increasing the out-put of her own raw material resources.

Summary

 The world leather industry is at present facing a serious crisis because people of both the developed and developing countries are gradually switching over from leather to synthetic leather goods for very high prices of leather articles even though the love for leather products is still strong.

 The leather products manufacturers, on the other hand, cannot reduce the prices of their products because the prices of leathers are too high.

 The high prices of leathers are due to very high prices of raw hides and skins.

 The prices of raw hides and skins are high because their supplies are inelastic in nature,

So the crisis of leather industryis mainly due to limited supply of raw hides and skins. Unless the supply of good quality hides and skins is increased the problems of this industry cannot be solved. Shifting of raw hides supply from the developed to the developing countries. modernization of tanneries, use of modern chemicals etc. are not the permanent and effective solutions to the actual problem. True solution lies in the increased supply of raw materials,

5. The developed countries, produce best quality hides and skins to the maximum possible extent. Their slaughtering rates are already too high. Except Canada, Australia, U.S.S.R., and U.S.A. which have surplus grazing land, other developed countries cannot increase their livestock population for want of grazing land. In developed countries, where excess

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and is available the cattle and human populations have balanced mech other and so rapid increase in investock population is also not possible there. So the possibility of increasing raw hide supply in the developed countries is not at all hright.

6. Most of the developing countries are over populated with diseased, illfed livestocks of small uze. The death rates (natural death and slaughtering together) of animals are very low. Appreciable percentage of hides and skins remains uncollected and major portion of the collected hides are too poor in quality to produce leathers, of International standard due to unorganized state of livestock wealth. The developing countries can, therefore, increase the supply of good quality hides by adjusting their livestock population with productive animals, by increasing the animal slaughtering rates and by adopting scientific methods of hide collection and preservation.

 For the survival of world leather industry the developing countries should come forward and take the necessary initiatives.

 The leather industries of the developed and the developing countries cannot survive individually. They can survive through mutual co-operation.

Sources for statistical data :

a) The leather and leather products industry upto 1985 By Irving R. Glass, UNIDO Consultant.

b) Draft world-wide study of the leather and leather products industry 1975_2000 by UN1DO.

c) Survey of India's Export Potential of Leather and Leather Products, Vol : 2, By Gokhale Institute of Politics and Economics, Poona and CLRI, Madras.

The views expressed in this paper are those of the author and do not necessarily reflect ILTA's.





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STUDENTS' CORNER

Synthetic Polymer For Leather Finishing

By S S DUTTA College of Leather Technology, Calcutta (Continued from May '84 issue)

POLYESTERS

PHOUGH alkyd resins are polyesters, they can not be used for making fibres of textile mfustry. For many years scientests had been trying to prepare synthetic fiber-forming polymers and their first attempt was to modify enfulose so that fibers could be made out of them. Thus cellulose mtrate, cellulose acetate, Saran, rayon, viscose etc. were discovered. But they were not hundred percent mathetic because the basic raw material was a natural polymer, millulose. In the second attempt polymers like polyesters, polyamides etc. were discovered which were hundred percent synthetic mer-forming polymers. Terylene, Decron, Melinex etc. of today are polyesters and nylon is a polyamide.

The first polyester resin was prepared by Carothers and coworkers by reacting glycerol with beradeca-methylene dicarboxylic acid but the material was not welcomed due to its low melting point (TO'C). High melting, useful polyester, polyethylene terephtalate. was prepared afterwards in 1941 by "hinfield and Dickson which is med today as terylene, decron etc. for making clothes.

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Since terephthalic acid does not easily react with glycol, dimethyl terephthalate is reacted with glycol in commercial practice to prepare terylene. The melting point of this ester is 141°C.

At first 2 moles of glycol is reacted with 1 mole of dimethyl terephthalate in presence of Catalyst like litharge, salts of Zn, Mg, Ca, Co etc. at a temperature of 150°-160°C. The methanol produced is efficiently removed and the reaction temperature automatically goes upto 230°C.

Properties and Uses :

Polyethylene terephthalate or terylene, thus produced, is a high melting (250-265°C), crystalline product, insoluble in most commercial solvents. It can be extruded to form sheets, filaments and films, Highly oriented strong fibers are drawn from this polymer for various uses. The polyester fibers are used for making clothes, shirt pieces, as well as fillers for pillows, sleeping bags etc.

It is also used for making tapes for sound recorder, photographic

$$CH_{3}OOC O COOCH_{3} + 2 HO.CH_{3} - CH_{4} - OH \longrightarrow$$

HO - $CH_{4} - CH_{5} - OOC O COOCH_{2} - CH_{3} - OH + 2 CH_{3}OH$

After this initial reaction the temperature of the product, thus produced, is raised when due to transesteri-fication or ester alcoholysis the polymer, terylene is produced and glycol vapour evolves which is immediately removed from the sphere of reation to accelerate the process.

n (HOCH₈CH₈OOC O COOCH₈ CH₈ OH)
$$\rightarrow$$

HO (CH₈ CH₈ OOC O COO)_n - CH₂ - CH₈ - OH
Polymer + (n-1) HOCH₈ CH₈OI



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film-base heavy-duty packaging etc. Polyester is also used as an insulating material for electrical goods.

UNSATURATED POLYESTER RESINS

At the beginning of Second World War, when glass fibers in woven cloth form appeared, there was a strong demand for plastic binder from air-force department to make gla s-fiber-reinforced-screen for aircrafts and radars, because for them a screen was necessary which was strong like steel, not fragile like glass, and possessed desired electrical properties. This demand was fulfilled by the introduction of mixtures of unsaturated polyester resins and suitable comonomers into which the upsaturated polyesters were soluble. During application suitable initiators were added to the mixture and applied and finally subjected to higher temperature when the comonomer polymerised and joined to the polyesters through unsaturated bonds present there.

Though different comonomers can be used, but in actual practice Styrene is widely used because it is casily available cheap material and produces hard thermoplastic.

Unsaturated polyester can be prepared either by selecting an unsaturated alcohol or by using an unsaturated acid, or by using both unsaturated alcohol and acid. Mixed unsaturated alcohols and mixed unsaturated acids also can be used to prepare unsaturated polye-ter. But in practice unsaturated acids like fumaric acid HOOC-CH=CH-COOH, maleic acid etc. are used with saturated alcohol, propylene glycol CH₃ - CH (OH)-CH₂OH, for polymer preparation.

The keeping quality of the mixture of styrene and unsaturated polyester is poor and the syrupy mixture gets solidified due to copolymerization specially at elevated temperature. So to improve the keeping quality of the syrup some suitable inhibitors like hydroquinone, Catechol and some of its derivatives in minor doses are added. During use of this syrup peroxide type of curing agents, which destroy the added inhibitors and Catalyses the copolymerization. are added to the syrup. The article. which is to be coated, is depped into this syrup, re-inforced with fibrous materials like glass fiber and cured at elevated temperature when a hard re-inforced solid plastic coating results on that article.

The structure of cured plastic is not clearly known but it definitely belongs to the thermoset class. The main advantage of this resin mixture is that it is a liquid and so ca-y for application and can be converted to solid plastic in short time by the application of peroxide, heat and light pressure.

The glass and other fiber reinforced plastic sheet is widely used for making body of cars.trucks, aeroplanes, trains etc. It is also used for making heater base, body of radio, television etc. Machine parts like valves are coated with glass fiberreinforced polyester plastics. It is also used in building construction, in boat making, and in electrical encapsolation, potting etc. Everyday the field of uses of reinforced polyester is increasing.

POLY AMIDES

When the first polyester (mp 70°C) produced by Carothers was

Nylon-6

n $[H_3N - (CH_3)_5 - COOH] \rightarrow H_3N - (CH_3)_5 - CO$ - $[-NH - (CH_3)_5 - CO]_{(n=2)} - NH - (CH_3)_5 - CCOH$

not accepted by textile industry, he switched over to the preparation of polyamides and successfully discovered nylons.

Nylon is actually the name of one of a series of compounds known as Superpolyamides. The most popular nylon known as Nylon-66 is prepared by heating adipic acid with hexamethylene diamine at 218°C for 13 hours in presence of Xylenol. The water vapour formed is removed by a current of nitrogen which also prevents oxidation. The mixture is then poured into alcohol when a white precipitate of nylon-66 is obtained.

 $HOOC - (CH_2)_4 - COOH$ + $H_4N - (CH_2)_6 - NH_2 \longrightarrow$ $H_2N - (CH_2)_6 - NH \longrightarrow CO -$ (CH₂)_4 - COOH + H_2O .

This way several dibasic acid molecules react with several diamines and form a linear chain of nylon-66

This nylon is called 66-nylon because each of the reactants conta ns 6 number of Carbon atoms. Similarly, when nylon is produced by the action of Sebacic acid, HOOC— $(CH_2)_8$ —COOH, and hexamethylene diamine, it is called 610-nylon, because Sebacic acid contains 10 Carbon atoms in its molecule.

Another way in which the polyamides may be made is by starting with a molecule which has an amino group at one end and a Carboxyl acid group at the other. Two examples are given below :

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Sylon-11

π [H₂N→(CH₃)₁₀ − COOH]→H₃N→(CH₂)₁₀→CO→ -[−NH→(CH₂)₁₀→CO]_{(0→2}) −NH→(CH₂)₁₀→COOH.

Commercial nylon fibers are inear and have molecular weight merages of the order of 12,000 to 20.000. If the mol, wt. is less than 2,000, the product is weak and brittle and when less than 6,000 it a totally unsuitable for fiber making. On the other hand, nylon of molecular weight more than 20,000 is unsuitable due to its very high melting point. So polymerization must be stopped as soon as the desired molecular weight is reached and that is done by a process known as Stabilization. For this purpose one of the reactants is taken in encess, so that the chain terminates with same groups on both the ends after the desired molecular weight is reached. When acid is taken in excess, both the ends of the chain contain_COOH group and when amide is in excess the chain ends with-NH2 groups on both ends. Stabilization is also done by adding monofunctional reagent in the sustem.

The most popular nylon for the textile industry is the 66 type because it produces superior type of fibers and the reactants for it are easily available cheaply. Adipic acid can be made from phenol by reduction with hydrogen, followed by oxidation with nitric acid. The becamethylene diamine, on the other hand, can be made from the adipic acid itself. polyoxamides. For example, 3methyl hexamethylenov diamine will react with diethyl oxalate or a similar ester at 240°C under nitrogen to form a high molecular weight polyoxamide, which is superior to nylon-66 in many respects.

Properties :

Nylon is a highly oriented, crystalline product of high strength in the stretched condition. It is stronger than any of the natural fibers but is not so strong as Fortisan, a type of fiber made by stretching cellulose acetate in steam under pressure and finally converting to regenerated cellulose by Saponification.

Nylon has good flexibility and its resistance to abrasion is more than four times that of wool. Upto 8 per cent stretching nylon is highly elastic and recovers its original length on release of tension.

Nylon is one of the lightest fibre forming polymers as will be understood from density comparison :

Polymers	Specific gravity		
Nylon-66		1.14	
Viscose		1.52	
Cellulose acetate	-	1.30	

This polymer turns slightly yellow when heated in air at 150°C for five hours; it is slightly better in this respect than silk or wool,

but not as good as the cellulosic

Nylon is resistant to common

HOOC-(CH₄)₄-COOH
$$\xrightarrow{NH_8} \rightarrow H_4NCO$$
-(CH₄)₄-CONH₄ $\xrightarrow{-H_8O}$
NC-(CH₄)₄-CN $\xrightarrow{H_8} \rightarrow H_4N$ -(CH₄)₄-NH₄

Another type of polyamides, simi- but no have recently been fibers.

developed and they are known as

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organic solvents, dilute acid and alkali, but breaks down to its constituents when boiled with Conc. HCl. It is also resistant to mildew, bacteria and moth larvae. It is degraded by the action of sunlight slowly.

Uses :

The high tenacity of nylon has made it of value for parachute fabric, rope, cords, harness and for glider. It is extensively used for making clothes, stockings, under garments etc. of elastic nature. Nylon cords are used in automobile tyres in place of rayons. It is also used for making upholstery, rugs, synthetic wools, bristles for tooth brush and other types of brushes. Nylon-6, which is soluble in aqueous isopropanol, is used to insulate electric wires. Nylon of high mol, wt. is extensively used for making gears and bearings because of its low dry friction and high abresive resistance. In many cases these bearings may be operated satisfactorily without any lubrication or by lubrication with water only.

Nylon is also used in injection moulding. Everyday new uses of this polymer are coming out.

POLYURETHANES

The discovery of Wurtz (1948) that an isocyanate can react with an alcohol by the transfer of the hydrogen atom of the hydroxyl group of alcohol to the nitrogen atom of the isocyanate group, is the basis of preparation of polyurethane polymers.

$\begin{array}{c} R-N-C=O+HO-R' \longrightarrow \\ R-NH-C-O-R' & \\ 0 & \\ 0 & \end{array}$

Since the bond formed in the above reaction has similarity with





the ester bond formed by Carbamic acid with alcohol, and the formed esters are known as urethanes, the name "Urethanes" has also been derived here.

 H_sN —COOH+HO— C_sH_s — \rightarrow Carbomic acid

H_sN-C-O-C_sH;

There are large number of isocyanate compounds, aliphatic and aromatic, of different functionality. Similarly, large number of alcohols or compounds with alcoholic-OH groups of different functionality are available. Naturally, large number of polyurethane polymers of varying properties can be manufactured. All types of polyurethane polymers, liquid, solid, soft or hard etc. are thus possible.

The following bi-functional diisocyanate compounds are generally used for the preparation of polyurethane.

OCN-(CH2) -NCO

Hexamethylene diisocyanate (Desmodur H) Similarly all types of glycols, glycerols are used in practice. For linear polymers bi-functional alcohols are reacted with bi-functional diisocvanates.

NH CO_x (CH_x)₄-n

In the above reaction no byproduct is obtained and so it may be considered as an addition polymerization.

Linear polyurethane can also be prepared by condensation method where bischloroformate ester of a glycol reacts with a diamine,

Cl.COO—R—OOC.Cl+ $H_gN \rightarrow R' \rightarrow NH_g \rightarrow \rightarrow$ [—ROOC.NH.R'.NH.COO—]₀ +HCl

Polyurethanes are formed even at room temperature when diisocyanate is mixed with di-ol compound and kept for sometime. In coating industry the mixture is therefore, immediately added after mixing otherwise the entire mixture may solidify to an unusable mass.

Since the two liquids (diisocyanate and glycol) are incompatible, vigorous stirring after mixing is always necessary.

For the manufacture of fiber forming polyurethane, the polymerization is carried out under an inert atmosphere at 195°C in a stainless steel autoclave. After the reaction the product is subjected to temporary vacuum for the removal of bubbles and then fed under nitrogen pressure to filters and finally used for making fibres.

Polyurethane emulsion can also be prepared by dispersing the reacting components in a suitable organic solvent like chlorobenzene.

The polyurethane, Perlon-U, which is formed due to reaction between Desmodur-H and tetramethylene glycol, is generally used in leather 'industry as a finishing binder. Excess Desmodur H is used so that the polymer chains end with isocyanate groups (-N = C = O) on both the ends. Desmodur-R also is used for this purpose.

Isocyanate is a very reactive group and can easily react with active hydrogen atoms present in different groups in different compounds as shown on next page;



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 $\begin{array}{l} R - NCO + R'NH_{*} - \cdots \rightarrow R N H C O N H R' \\ R - NCO + HO - R' - \cdots \rightarrow R. N H C O O R' \\ R - NCO + H.OH - \cdots \rightarrow R - NH.COOH - \cdots \rightarrow R - NH_{*} + CO_{*} \\ R - NCO + R' - COOH - R - NH.COO.COR' - \rightarrow R - NHCOR' + CO_{*} \end{array}$

Similarly the terminal isocyanate group of one polyurathane chain an react with the urethane group of another chain to form cross linkage.

The isocyanate group can also react with amide group present in protrin or other compounds.

The isocyanate group also reacts in a similar manner with urea type of groups.

-NH-CO-NH- + OCN - - - NH-CO-N-

Properties :

The linear polyurethanes are a class of crystalline, fibre forming polymers closely related to polyamides. If the urethane group is compared with an amide group it will be seen that an extra oxygen is there in the main chain of urethane.

So polyurethane is more flexible than the corresponding polyamide and the softening temperature of the former is less than the latter. Polyurethane is a polymer of high percentage of elongation and high resistance to abrasion. For his reason it is considered best for the finishing of upholstery and patent leathers.

CONH-

Perlon-U has a melting point of about 180°C which is about 80°C lower than that of nylon. Perlon-U is stiffer than Nylon-66 but in many other properties this polymer has similarity with Nylon-610. Like nylon it does not become brown when heated. Molecular weight and specific gravity are nearly 15,000 and 1.21 respectively.

Uses :

Polyurethanes are widely used as adhesives. It can join metals, papers, leathers, glass and ceramics, textiles with any surface. It can be used for sticking rubber soles to leather uppers. The bond cures in a few minutes after the application of heat.

It is also used for coating purpose. The coating hardens slowly at room temperature or rapidly if heated. So it is an ideal coating material for heat sensitive material like leather. The coatings are very flexible, and are resistant to water,

solvents, and alkalies. They are characterized by high gloss, low gas permeability, high resistance to abresion and excellent electrical insulating properties. So it is used for coating storage tanks, conveyor belts for handling corrosive and abrasive materials, rubber glossy toys, patent leather, magnet wires.

Polyurethanes can be modified by miny materials like alkyds, fatty acids, drying oils, phenoplasts, nitrovellulose vinyl resins etc and the modified products are widely used in paints and lacquers.

One of the best types of foams of varying physical and chemical properties are manufactured from polyurethanes. In many respects these foams are superior to rubber foams. It is widely used in clastomer (rubber) industry. Polyurethane elastomer hardens at-35°C.

To be continued



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Inflation : Defination and Effect on the Purchasing Power and the Economy

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Abstract :

Understanding Inflation

- Inflation is the rate at which prices for goods and services rise.
- Inflation is sometimes classified into three types: demandpull inflation, cost-push inflation, and built-in inflation.
- The most commonly used inflation indexes are the Consumer Price Index and the Wholesale Price Index.
- Inflation can be viewed positively or negatively depending on the individual viewpoint and rate of change.
- Those with tangible assets, like property or stocked commodities, may like to see some inflation as that raises the value of their assets.

What Is Inflation?

Inflation is a rise in prices, which can be translated as the decline of purchasing power over time. The rate at which purchasing power drops can be reflected in the average price increase of a basket of selected goods and services over some time. The rise in prices, which is often expressed as a percentage, means that a unit of currency effectively buys less than it did in prior periods. Inflation can be contrasted with deflation, which occurs when prices decline and purchasing power increases.



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While it is easy to measure the price changes of individual products over time, human needs extend beyond just one or two products. Individuals need a big and diversified set of products as well as a host of services for living a comfortable life. They include commodities like food grains, metal, fuel, utilities like electricity and transportation, and services like healthcare, entertainment, and labor.

Inflation aims to measure the overall impact of price changes for a diversified set of products and services. It allows for a single value representation of the increase in the price level of goods and services in an economy over a specified time.

Prices rise, which means that one unit of money buys fewer goods and services. This loss of purchasing power impacts the cost of living for the common public which ultimately leads to a deceleration in economic growth. The consensus view among economists is that sustained inflation occurs when a nation's money supply growth outpaces economic growth.

The increase in the Consumer Price Index for All Urban Consumers (CPI-U) over the 12 months ending December 2023. Prices rose 0.1% on a seasonally adjusted basis in November from the previous month.^[1]

To combat this, the monetary authority (in most cases, the central bank) takes the necessary steps to manage the money supply and credit to keep inflation within permissible limits and keep the economy running smoothly.

Theoretically, monetarism is a popular theory that explains the relationship between inflation and the money supply of an economy. For example, following the Spanish conquest of the Aztec and Inca empires, massive amounts of gold and silver flowed into the Spanish and other European economies. Since





the money supply rapidly increased, the value of money fell, contributing to rapidly rising prices.^[2]

Inflation is measured in a variety of ways depending on the types of goods and services. It is the opposite of deflation, which indicates a general decline in prices when the inflation rate falls below 0%. Keep in mind that deflation shouldn't be confused with disinflation, which is a related term referring to a slowing down in the (positive) rate of inflation.



Causes of Inflation

An increase in the supply of money is the root of inflation, though this can play out through different mechanisms in the economy. A country's money supply can be increased by the monetary authorities by:

- > Printing and giving away more money to citizens
- Legally devaluing (reducing the value of) the legal tender currency
- Loaning new money into existence as reserve account credits through the banking system by purchasing government bonds from banks on the secondary market (the most common method)

In all of these cases, the money ends up losing its purchasing power. The mechanisms of how this drives inflation can be classified into three types: demand-pull inflation, cost-push inflation, and built-in inflation.

Demand-Pull Effect

Demand-pull inflation occurs when an increase in the supply of money and credit stimulates the overall demand for goods and services to increase more rapidly than the economy's production capacity. This increases demand and leads to price rises.

When people have more money, it leads to positive consumer sentiment. This, in turn, leads to higher spending, which pulls prices higher. It creates a demand-supply gap with higher demand and less flexible supply, which results in higher prices.

Cost-Push Effect

Cost-push inflation is a result of the increase in prices working through the production process inputs. When additions to the supply of money and credit are channelled into a commodity or other asset markets, costs for all kinds of intermediate goods rise. This is especially evident when there's a negative economic shock to the supply of key commodities.

These developments lead to higher costs for the finished product or service and work their way into rising consumer prices. For instance, when the money supply is expanded, it creates a speculative boom in oil prices. This means that the cost of energy can rise and contribute to rising consumer prices, which is reflected in various measures of inflation.

Built-in Inflation

Built-in inflation is related to adaptive expectations or the idea that people expect current inflation rates to continue in the future. As the price of goods and services rises, people may expect a continuous rise in the future at a similar rate.

As such, workers may demand more costs or wages to maintain their standard of living. Their increased wages result in a higher cost of goods and services, and this wage-price spiral continues as one factor induces the other and vice-versa.

Types of Price Indexes

Depending upon the selected set of goods and services used, multiple types of baskets of goods are calculated and tracked as price indexes. The most commonly used price indexes are the Consumer Price Index (CPI) and the Wholesale Price Index (WPI).







The Consumer Price Index (CPI)

The CPI is a measure that examines the weighted average of prices of a basket of goods and services that are of primary consumer needs. They include transportation, food, and medical care.

CPI is calculated by taking price changes for each item in the predetermined basket of goods and averaging them based on their relative weight in the whole basket. The prices in consideration are the retail prices of each item, as available for purchase by the individual citizens.

Changes in the CPI are used to assess price changes associated with the cost of living, making it one of the most frequently used statistics for identifying periods of inflation or deflation. In the U.S., the Bureau of Labor Statistics (BLS) reports the CPI on a monthly basis and has calculated it as far back as 1913.^[3]

The CPI-U, which was introduced in 1978, represents the buying habits of approximately 88% of the non-institutional population of the United States. $^{[4]\,[5]}$

The Wholesale Price Index (WPI)

The WPI is another popular measure of inflation. It measures and tracks the changes in the price of goods in the stages before the retail level.

While WPI items vary from one country to another, they mostly include items at the producer or wholesale level. For example, it includes cotton prices for raw cotton, cotton yarn, cotton grey goods, and cotton clothing.^[6]

Although many countries and organizations use WPI, many other countries, including the U.S., use a similar variant called the producer price index (PPI).^[7]

The Producer Price Index (PPI)

The PPI is a family of indexes that measures the average change in selling prices received by domestic producers of intermediate goods and services over time. The PPI measures price changes from the perspective of the seller and differs from the CPI which measures price changes from the perspective of the buyer.^[8]

In all variants, the rise in the price of one component (say oil) may cancel out the price decline in another (say wheat) to a certain extent. Overall, each index represents the average weighted price change for the given constituents which may apply at the overall economy, sector, or commodity level.

The Formula for Measuring Inflation

The above-mentioned variants of price indexes can be used to calculate the value of inflation between two particular months (or years). While a lot of ready-made inflation calculators are already available on various financial portals and websites, it is always better to be aware of the underlying methodology to ensure accuracy with a clear understanding of the calculations. Mathematically,

Percent Inflation Rate = (Final CPI Index Value ÷ Initial CPI Value) x 100

Say you wish to know how the purchasing power of \$10,000 changed between September 1975 and September 2018. One can find price index data on various portals in a tabular form. From that table, pick up the corresponding CPI figures for the given two months. For September 1975, it was 54.6 (initial CPI value) and for September 2018, it was 252.439 (final CPI value). ^{[9] [10]}

Plugging in the formula yields:

Percent Inflation Rate = (252.439 ÷ 54.6) x 100 = (4.6234) x 100 = 462.34%

Since you wish to know how much \$10,000 from September 1975 would worth be in September 2018, multiply the inflation rate by the amount to get the changed dollar value:

Change in Dollar Value = 4.6234 x \$10,000 = \$46,234.25


This means that \$10,000 in September 1975 will be worth \$46,234.25. Essentially, if you purchased a basket of goods and services (as included in the CPI definition) worth \$10,000 in 1975, the same basket would cost you \$46,234.25 in September 2018.

Advantages and Disadvantages of Inflation

Inflation can be construed as either a good or a bad thing, depending upon which side one takes, and how rapidly the change occurs.

Losers	Winners
 Savers Retirees living on fixed incomes Workers on fixed incomes Borrowers on variable rates Whole economy – from general economic uncertainty Exporters less competitive 	 Debtors on fixed repayments plans Governments with high public sector debt Owners of land and physical assets Firms who can cut real wages

Advantages

Individuals with tangible assets (like property or stocked commodities) priced in their home currency may like to see some inflation as that raises the price of their assets, which they can sell at a higher rate.

Inflation often leads to speculation by businesses in risky projects and by individuals who invest in company stocks because they expect better returns than inflation.

An optimum level of inflation is often promoted to encourage spending to a certain extent instead of saving. If the purchasing power of money falls over time, there may be a greater incentive to spend now instead of saving and spending later. It may increase spending, which may boost economic activities in a country. A balanced approach is thought to keep the inflation value in an optimum and desirable range.

Disadvantages

Buyers of such assets may not be happy with inflation, as they will be required to shell out more money. People who hold assets valued in their home currency, such as cash or bonds, may not like inflation, as it erodes the real value of their holdings. As such, investors looking to protect their portfolios from inflation should consider inflation-hedged asset classes, such as gold, commodities, and real estate investment trusts (REITs). Inflation-indexed bonds are another popular option for investors to profit from inflation.

High and variable rates of inflation can impose major costs on an economy. Businesses, workers, and consumers must all account for the effects of generally rising prices in their buying, selling, and planning decisions.

This introduces an additional source of uncertainty into the economy, because they may guess wrong about the rate of future inflation. Time and resources expended on researching, estimating, and adjusting economic behaviour are expected to rise to the general level of prices. That's opposed to real economic fundamentals, which inevitably represent a cost to the economy as a whole.

Even a low, stable, and easily predictable rate of inflation, which some consider otherwise optimal, may lead to serious problems in the economy. That's because of how, where, and when the new money enters the economy.

Whenever new money and credit enter the economy, it is always into the hands of specific individuals or business firms. The process of price level adjustments to the new money supply proceeds as they then spend the new money and it circulates from hand to hand and account to account through the economy.

Inflation does drive up some prices first and drives up other prices later. This sequential change in purchasing power and prices (known as the Cantillon effect) means that the process of inflation not only increases the general price level over time. But it also distorts relative prices, wages, and rates of return along the way.^[11]

Economists, in general, understand that distortions of relative prices away from their economic equilibrium are not good for the economy, and Austrian economists even believe this process to be a major driver of cycles of recession in the economy.^[12]

Pros:

> Leads to higher resale value of assets



> Optimum levels of inflation encourage spending

Cons:

- > Buyers have to pay more for products and services
- > Impose higher prices on the economy
- > Drives some prices up first and others later

Controlling Inflation

A country's financial regulator shoulders the important responsibility of keeping inflation in check. It is done by implementing measures through monetary policy, which refers to the actions of a central bank or other committees that determine the size and rate of growth of the money supply.



In the U.S., the Fed's monetary policy goals include moderate long-term interest rates, price stability, and maximum employment. Each of these goals is intended to promote a stable financial environment. The Federal Reserve clearly communicates long-term inflation goals in order to keep a steady long-term rate of inflation, which is thought to be beneficial to the economy.

Price stability or a relatively constant level of inflation allows businesses to plan for the future since they know what to expect. The Fed believes that this will promote maximum employment, which is determined by non-monetary factors that fluctuate over time and are therefore subject to change.

For this reason, the Fed doesn't set a specific goal for maximum employment, and it is largely determined by employers' assessments. Maximum employment does not mean zero unemployment, as at any given time there is a certain level of volatility as people vacate and start new jobs. ^[13] [14]

Hyperinflation is often described as a period of inflation of 50% or more per month. ^[15]

Monetary authorities also take exceptional measures in extreme conditions of the economy. For instance, following the 2008 financial crisis, the U.S. Fed kept the interest rates near zero and pursued a bond-buying program called quantitative easing (QE).^[16]

Some critics of the program alleged it would cause a spike in inflation in the U.S. dollar, but inflation peaked in 2007 and declined steadily over the next eight years. There are many complex reasons why QE didn't lead to inflation or hyper-inflation, though the simplest explanation is that the recession itself was a very prominent deflationary environment, and quantitative easing supported its effects. ^[17] ^[18]

Consequently, U.S. policymakers have attempted to keep inflation steady at around 2% per year. The European Central Bank (ECB) has also pursued aggressive quantitative easing to counter deflation in the eurozone, and some places have experienced negative interest rates. That's due to fears that deflation could take hold in the eurozone and lead to economic stagnation. ^[19] ^[20]

Moreover, countries that experience higher rates of growth can absorb higher rates of inflation. India's target is around 4% (with an upper tolerance of 6% and a lower tolerance of 2%), while Brazil aims for 3.25% (with an upper tolerance of 4.75% and a lower tolerance of 1.75%).^{[21] [22]}

Hedging Against Inflation

Stocks are considered to be the best hedge against inflation, as the rise in stock prices is inclusive of the effects of inflation. Since additions to the money supply in virtually all modern economies occur as bank credit injections through the financial system, much of the immediate effect on prices





happens in financial assets that are priced in their home currency, such as stocks.

Special financial instruments exist that one can use to safeguard investments against inflation. They include Treasury Inflation-Protected Securities (TIPS), low-risk treasury security that is indexed to inflation where the principal amount invested is increased by the percentage of inflation.^[23]

One can also opt for a TIPS mutual fund or TIPS-based exchange-traded fund (ETF). To get access to stocks, ETFs, and other funds that can help avoid the dangers of inflation, you'll likely need a brokerage account. Choosing a stockbroker can be a tedious process due to the variety among them. Gold is also considered to be a hedge against inflation, although this doesn't always appear to be the case looking backward.



Examples of Inflation

Since all world currencies are fiat money, the money supply could increase rapidly for political reasons, resulting in rapid price level increases. The most famous example is the hyperinflation that struck the German Weimar Republic in the early 1920s.

The nations that were victorious in World War I demanded reparations from Germany, which could not be paid in German paper currency, as this was of suspect value due to government borrowing. Germany attempted to print paper notes, buy foreign currency with them, and use that to pay their debts.

This policy led to the rapid devaluation of the German mark along with the hyperinflation that accompanied the development. German consumers responded to the cycle by trying to spend their money as fast as possible, understanding that it would be worth less and less the longer they waited. More money flooded the economy, and its value plummeted to the point where people would paper their walls with practically worthless bills. Similar situations occurred in Peru in 1990 and in Zimbabwe between 2007 and 2008. ^[24] [^{25]} [^{26]}

What Causes Inflation?

There are three main causes of inflation: demand-pull inflation, cost-push inflation, and built-in inflation.

- Demand-pull inflation refers to situations where there are not enough products or services being produced to keep up with demand, causing their prices to increase.
- Cost-push inflation, on the other hand, occurs when the cost of producing products and services rises, forcing businesses to raise their prices.
- Built-in inflation (which is sometimes referred to as a wageprice spiral) occurs when workers demand higher wages to keep up with rising living costs. This in turn causes businesses to raise their prices in order to offset their rising wage costs, leading to a self-reinforcing loop of wage and price increases.

Is Inflation Good or Bad?

Too much inflation is generally considered bad for an economy, while too little inflation is also considered harmful. Many economists advocate for a middle ground of low to moderate inflation, of around 2% per year.

Generally speaking, higher inflation harms savers because it erodes the purchasing power of the money they have saved; however, it can benefit borrowers because the inflation-adjusted value of their outstanding debts shrinks over time.

What Are the Effects of Inflation?

Inflation can affect the economy in several ways. For example, if inflation causes a nation's currency to decline, this can benefit exporters by making their goods more affordable when priced in the currency of foreign nations.

On the other hand, this could harm importers by making foreignmade goods more expensive. Higher inflation can also



encourage spending, as consumers will aim to purchase goods quickly before their prices rise further. Savers, on the other hand, could see the real value of their savings erode, limiting their ability to spend or invest in the future.

Why Is Inflation So High Right Now?

In 2022, inflation rates around the world rose to their highest levels since the early 1980s. While there is no single reason for this rapid rise in global prices, a series of events worked together to boost inflation to such high levels. ^[27] [28]

The COVID-19 pandemic led to lockdowns and other restrictions that greatly disrupted global supply chains, from factory closures to bottlenecks at maritime ports. Governments also issued stimulus checks and increased unemployment benefits to counter the financial impact on individuals and small businesses. When vaccines became widespread and the economy bounced back, demand (fuelled in part by stimulus money and low interest rates) quickly outpaced supply, which still struggled to get back to pre-COVID levels.

Russia's unprovoked invasion of Ukraine in early 2022 led to economic sanctions and trade restrictions on Russia, limiting the world's supply of oil and gas since Russia is a large producer of fossil fuels. Food prices also rose as Ukraine's large grain harvests could not be exported. As fuel and food prices rose, it led to similar increases down the value chains. The Fed raised interest rates to combat the high inflation, which significantly came down in 2023, though it remains above pre-pandemic levels. ^{[29] [9]}

The Bottom Line & Conclusion

Inflation is a rise in prices, which results in the decline of purchasing power over time. Inflation is natural and the U.S. government targets an annual inflation rate of 2%; however, inflation can be dangerous when it increases too much, too fast. Inflation makes items more expensive, especially if wages do not rise by the same levels of inflation. Additionally, inflation erodes the value of some assets, especially cash. Governments and central banks seek to control inflation through monetary policy.

Source: https://www.investopedia.com/terms/i/inflation.asp

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Economic Corner



EXPORTS UP 1%; DEC TRADE DEFICIT NARROWS TO 3-MONTH LOW



The country's exports edged up 1 per cent to \$38.45 billion in December 2023 while the trade deficit narrowed to a threemonth low of \$19.8 billion, official data released on Monday showed.

Imports declined by 4.85 per cent to \$58.25 billion in December last year due to a dip in crude oil shipments. The previous low in trade deficit - the difference between imports and exports was recorded in September at \$19.37 billion. In December 2022, it was \$23.14 billion. Crude oil imports declined by 22.77 per cent to about \$15 billion during the month under review.

However, gold imports jumped 156 per cent in December 2023 to \$3 billion. Crude oil imports in April-December 2023-24 declined by about 19 per cent to \$128.6 billion while gold imports surged by 26.64 per cent to about \$36 billion in April-December 2023.



Exports during April-December this fiscal dipped by 5.7 per cent to \$317.12 billion. Imports contracted by 7.93 per cent to \$505.15 billion, leaving a trade deficit of \$188.02 billion in the first three quarters as against \$212.34 billion in April-December 2022.

Briefing reporters on the data, commerce secretary Sunil Barthwal said that despite a global slowdown, "we are in the positive zone and the trade deficit has also come down". The exports are struggling on account of demand slowdown in Western countries, besides geopolitical tensions.



The Red Sea crisis will also hurt exports in the coming months as exporters are holding up consignments. India's merchandise exports have lingered in the last several months except for October. "The whole globe is facing an adverse condition. "Globally the picture is quite bad, but India is doing well. "We hope to beat the global trends in the January-March quarter also.

"Yes, we are waiting and watching what is happening in the Red Sea," he told reporters in New Delhi and expressed confidence that the country's goods and services exports would cross last year's figure of \$776 billion. He added that the Red Sea crisis would have an impact on exports on account of increase in transportation cost.

The ministry is holding an inter-ministerial meeting to take stock of the situation. The situation around the Bab-el-Mandeb Strait, a crucial shipping route connecting the Red Sea and the Mediterranean Sea to the Indian Ocean, has escalated due to attacks by Yemen-based Houthi militants. Due to these attacks,

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the shippers are taking consignments through the Cape of Good Hope, resulting in delays of almost 14 days and also higher freight and insurance costs.

The commerce ministry has also asked the ECGC not to increase the export credit interest rates. State-owned ECGC is an export promotion organisation, seeking to improve the competitiveness of Indian exports by providing them with credit insurance covers.

During December 2023, key export sectors that have recorded negative growth included petroleum products, ready-made garments of all textiles, chemicals, and leather products.

Sectors which are in the positive zone include plastic, electronic goods, engineering items, and gems and jewellery. According to the data, the estimated value of services export has contracted to \$27.88 billion, as compared to \$31.19 billion in December 2022.

During the nine-month period, however, these exports rose to \$247.92 billion as compared to \$239.5 billion in April-December 2022.

(Rediffmail.com - 15/01/2024)

WHOLESALE INFLATION RISES TO 0.73% IN DECEMBER



The wholesale price index (WPI)-based inflation rose in December at 0.73 per cent mainly due to a sharp rise in food prices. The WPI inflation was in the negative zone from April to October and had turned positive in November at 0.26 per cent. "Positive rate of inflation in December 2023 is primarily due to increase in prices of food articles, machinery & equipment, other manufacturing, other transport equipment and computer, electronics & optical products etc," the commerce and industry ministry said in a statement on Monday.

Food inflation rose to 9.38 per cent in December from 8.18 per cent in November 2023.



Inflation in vegetables was 26.30 per cent, while in pulses it was 19.60 per cent in December. Retail or consumer pricebased inflation (CPI) print for December rose to a 4-month high of 5.69 per cent, as per data released last week.

The Reserve Bank in its bi-monthly monetary policy last month held interest rates steady and flagged risks of rising food inflation in November and December.

(PTI – 15/01/2024)

FOREX RESERVES FALL SHARPLY BY \$5.89 BN TO \$617.3 BN: RBI



Forex reserves declined sharply by \$5.89 billion to \$617.3 billion for the week ending January 5 after rising for four consecutive

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weeks, according to the weekly Reserve Bank data released on Friday.

So far, this fiscal, the reserves have increased \$55.72 billion, according to the Reserve Bank of India (RBI). In the previous reporting week ended December 29, the reserves rose \$2.759 billion to \$623.2 billion, the highest so far this fiscal.

In the week before that, the reserves increased \$4.471 billion to \$620.441. In October 2021, the forex kitty had reached an all-time high of \$645 billion. The reserves took a hit as the central bank stepped in to defend the rupee amid pressures caused majorly by global developments since last year.

Foreign currency assets — the single-largest component of the reserves — declined \$4.96 billion to \$546.65 billion. Gold reserves also declined \$839 million to \$47.48 billion during the reporting week, while the Special Drawing Rights (SDRs) were down \$67 million to \$18.29 billion, the RBI said.

The country's reserve position with the IMF also declined \$26 million to \$48.66 billion in the reporting week.

(Rediff.com - 12/01/2024)

BUDGET 2024: EXTEND ALL MSME BENEFITS TO RETAIL TRADERS, URGES RETAILERS' BODY RAI



Retailers' body Retailers Association of India (RAI), in its prebudget expectations, has urged the government to extend all benefits available for MSMEs in the country to retail traders also. Currently, retail and wholesale traders are eligible only for formal credit under the priority sector lending (PSL) norms.

Retail and wholesale trades were added to the MSME definition for PSL benefits from banks in July 2021. PSL refers to the mandatory lending targets set by the Reserve Bank of India (RBI) for banks and financial institutions to ensure that certain sectors of the economy including MSME receive adequate credit and financial support. The objective of priority sector lending is to promote inclusive growth, reduce regional imbalances, and support marginalized sections of society.

Currently, MSMEs with Udyam registration are eligible for benefits beyond PSL such as registration on Government eMarketplace portal for public procurement, Samadhaan portal for addressing issues related to delayed payments, and TReDS platform to finance their invoices.

Moreover, subsidy on patent registration, electricity bill concessions, reimbursement of ISO certification (cost), marketing and promotion assistance from the government, and technology upgradation support are among other benefits available to registered MSMEs.

RAI also sought a lower interest rate for retailers to assure easier financing. "The government should allocate a special fund and formulate a special trader finance scheme with SIDBI to help millions of independent retailers across the nation by declaring low-cost loans and relaxing some industry guidelines," it said.

The association further suggested steps to encourage retailers to use EDC (electronic data capturing) machines and also that the cost of accepting digital payments is never more than the cost of accepting cash. For this, RAI called for free or subsidized dispensation of such machines to retailers. "This can be done in stages – around 25 lakh machines to start with can be a good start. It will also help the government as these retailers will register under GST."

Among other suggestions made by the association were lower taxes, simplified GST norms, promoting digital transactions through subsidized MDR (merchant discount rate) on the use of the debit card, expediting formulation and implementation of the National Retail Policy, and adopting the Model Shops and Establishment Act that enables the states to choose to keep shops and other such establishments open 24x7 all through the year.

(Financial Express – 10/01/2024)

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86% OF CEOS THINK INDIA'S ECONOMIC GROWTH WILL IMPROVE OVER THE NEXT 12 MONTHS: PWC'S SURVEY



As much as 86 per cent of India CEOs think that the country's economy will improve over the next 12 months, according to PwC's 27th Annual Global CEO Survey. The study further highlighted that 62 per cent of India CEOs are confident about their company's growth over the next 12 months.

India leaders are convinced that their companies are on the right track. When asked how confident they were about their company's growth over the next 12 months, 62 per cent of India CEOs said they were 'extremely or very confident', as against 37 per cent of global CEOs. About 70 per cent of India CEOs – as against 49 per cent of global CEOs – said they were confident of their company's prospects for revenue growth over the next three years.

However, the survey, which polled 4,702 CEOs in 105 countries and territories, including 79 from India, further showed that India CEOs saw inflation and cyber risks as the biggest threats to their businesses in the short term (12-month period). India's annual retail inflation hit a 15-month high of 7.44 per cent in July 2023 but had cooled to around 5.5 per cent in November 2023.

The perceived risk from cyber threats saw a jump of 10 per cent from last year, with 28 per cent of India CEOs – as against 18 per cent last year – expecting extreme/high exposure to it. Health threats also figure high on the India CEOs' list, with 27 per cent saying they expected their companies to be extremely and highly exposed to these over the next 12 months. The concern over health is evident with employees actively seeking employers who offer generous health insurance for their families.

Sanjeev Krishan, Chairperson, PwC in India, said: "Despite continuing global headwinds, the Indian economy has remained

resilient with expectations of a strong growth trajectory in the near future. While India CEOs will indeed play a big role in the country becoming a five-trillion-dollar economy, they will also need to reinvent their businesses and work culture to ensure long-term sustainable success."

He further added that India's business leaders will need to strategically tackle barriers such as regulatory constraints and lack of tech capabilities to turn them into growth opportunities which will create lasting value for businesses, society and the environment.

In addition to this, around 71 per cent of India CEOs expected GenAl to increase employee efficiency over the next 12 months, while 70 per cent believed it would improve their own performance. They also believe it is likely to increase revenue (48 per cent) and profitability (46 per cent). On the impact of the growing use of GenAl, around 30 per cent of India CEOs felt it would lead to the shrinking of jobs, but there was broader acknowledgement of its potential to create new job opportunities, with 48 per cent saying it would have little or no impact on headcount and 13 per cent seeing an increase.

(Business Today – 16/01/2024)

WE LEAD TO CREDIBLE INDIA: INDIAN LOUNGES DOMINATE WORLD ECONOMIC FORUM IN DAVOS



About a dozen Indian lounges have dominated the main Promenade Street of Davos as the snowcapped resort town readies for the five-day World Economic Forum Annual Meeting beginning from 15th January.

Adorning the event are WeLead Lounge - set up to showcase women leadership, India Engagement Centre, pavilions by





Maharashtra, Tamil Nadu, Telangana and Karnataka, and IT majors like Wipro, Infosys, TCS and HCLTech showcasing power of AI and technology. And this time, in addition to Indian tea, coffee, 'samosas' and 'kachoris', there will also be Indian liquor flying off the shelves during 'Spirit of India Hour' on two evenings at a few bars, restaurants and lounges.

In all, 60-70 lounges and pavilions have been set up by governments and corporates from across the world, of which about a dozen are Indian ones.Indian participation is also significant with three union ministers, as many chief ministers and a large number of officials and CEOs expected to speak over the next five days.

Apex industry chamber CII has also planned a big campaign this time. The Indian industry's presence at Davos has been conceptualized with the theme of 'Credible India' to showcase and spotlight India's impressive economic achievements and its future potential as a significant contributor to global growth.

While the India Lounge has moved to a new place, CII has set up the CII Indian Business Hub and the industry body will also host several breakfast and lunch sessions, fireside chats and panel discussions.

CII has also initiated the 'Spirit of India Hour' which would take place at four locations to showcase Indian wine and spirits. The Women and Child Development Minister of India would inaugurate the WeLead lounge on 15th. It would host various gender-related conversations to drive women-led development.

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-: <u>JILTA</u>:-

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ILTA PUBLICATION

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Indian Leather Technologists' Association

[A Member Society of International Union of Leather Technologists' and Chemists Societies]

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History and Activities of Registration No. KOL RMS/074/2022-24 Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the originator of Das-Stiasnay theory and father of Indian Leather Science on 14 th August' 1950. The primary objectives of the oldest Leather Technologists' Association which celebrated its Diamond Jubilee year in the 2010, are:

- To bring all concerned with the broad spectrum of the leather industry under one umbrella.
- To organize seminar, symposium, workshop in order to create information, knowledge and latest development for the benefit of all concerned. To offer a common platform for all to interact with each other in order to understand each other's problems and prospects.
- To publish monthly journal as a supplement to those above objectives. The monthly journal of ILTA is known as journal of Indian Leather Technologists' Association and is the most widely circulated technical journal concerning leather technology.
- To publish text books for the benefit of students at various levels of study, for the researchers and industry.
- To have interface between urban and rural sector.
- To assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies acceptable and adoptable to the industry.
- To organize practical training and to provide skilled manpower and to motivate good students for study.

• To conduct activities related to the growth of the export of leather and leather goods from India. ILTA also organizes Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14 th August and Sanjoy Sen Memorial Lecture on 14 th January, the birthday of our late President for several decades. Many reputed scientists, industrialists and educationists have delivered these prestigious lectures. Foreign dignitaries during their visits to India have addressed the members of ILTA at various times.

ILTA have published the following books:

- 1. An Introduction to the Principles of Physical Testing of Leather by Prof. S.S. Dutta
- 2. Practical Aspects of Manufacture of Upper Leathers by J. M. Dey
- 3. An Introduction to the Principles of Leather Manufacture by Prof. S. S. Dutta
- 4. Analytical Chemistry of Leather Manufacture by P.K. Sarkar
- 5. Comprehensive Footwear Technology by Mr. Somnath Ganguly
- 6. Treatise on Fatliquors and Fatliquoring of Leather by Dr. Samir Dasgupta
- 7. Synthetic Tanning Agents by Dr. Samir Dasgupta
- 8. Hand Book of Tanning by Prof. B. M. Das



ILTA presents awards in the name of Prof. B. M. Das Memorial, Sanjoy Sen Memorial and J. M. Dey Memorial Medals to the top rankers at the University graduate and post graduate levels. J. Sinha Roy Memorial Award for the anthor of the best contribution for the entire year published in the monthly journal of the Indian Leather Technologists' Association (JILTA). From the year 2023 ILTA has started to present a Scholarship namely Prof. Moni Banerjee Memorial Scholarship to a Student of B. Tech / M. Tech Leather Technology who is meritorious but financially crippled.

ILTA is the Member Society of IULTCS (International Union of Leather Technologists' and Chemists Societies) which is a 125 years old organization. The International Congress of this union is held in different locations of the world once in two years. In its 125 years history, for the first time the Congress was held in January 1999 outside the developed countries and that too in India at CLRI, Chemai. Indian Leather Technologists Association organized the Congress under the able leadership and guidance of Late Sanjoy Sen, the then President of ILTA and IULTCS and Dr. T. Ramasami, the then Vice-President of ILTA and Director, CLRI, Chemai. In 2017 IULTCS Congress was successfully held again at Chemai, India for the second time. In order to promote and provide marketing facilities, to keep pace with the latest design and technology, to have better interaction with the domestic buyers, ILTA has been organizing LEXPO fairs at Kolkata from 1977, Siliguri from 1992 and Durgapur from 2010. To help the tiny, cottage and small-scale sectors industries in marketing, LEXPO fairs give the exposure for their products. Apart from Kolkata & amp; Siliguri and Durgapur, ILTA have held LEXPO at Bhubaneswar, Gangtok, Guwahati, Jamshedpur and Ranchi. In commensurate with the time, demand and new perspective of the modern leather users, ILTA has started to organize LEXPO at Kolkata from 2022 in a new shape with the Manufacturers and Exporters of Leather Goods from all over India.

ILTA has celebrated its Golden Jubilee with a year-long programme from 14 th August' 2000 to 13 th August' 2011 along with the first conference of South East Asian Countries at Netaji Indoor Stadium, Kolkata.

ILTA has also celebrated its Diamond Jubilee with a year long programme from 14 th August' 2010 to 13 th August' 2011 which included National Seminars, B. M. Das Memorial Lecture, Sanjoy Sen Memorial Lecture, Moni Banerjee Memorial Lecture, Y. Nayudamma Memorial Lecture and 3 day's AICLST (Asia International Conference on Leather Science and Technology) at Hotel 'The Stadle' at Salt Lake City, Kolkata.

The Association's present (as on 31.03.2023) strength of members is around 550 from all over India and abroad. Primarily the members are leather technologists passed out from Govt. College of Engineering and Leather Technology – Kolkata, Anna University – Chemnai, Harcourt Butler Technological Institute – Kanpur, B. R. Ambedkar National Institute of Technology – Jalandhar and Scientists and Research Scholars from Central Leather Research Institute (CLRI).

In order to strengthen its activities, ILTA have constructed its own six storied building at 44, Shanti Pally, Kasba, Kolkata – 700107, West Bengal, India and have named it as "Sanjoy Bhavan".

This Association is managed by an Executive Committee duly elected by the members of the Association. It is absolutely a non-profit making voluntary organization working for the betterment of the Leather Industry. None of the Executive Committee members draws any remuneration for their services rendered but they get the satisfaction of being a part of this esteemed organization.



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