JILTA

ILTA
Since 1950

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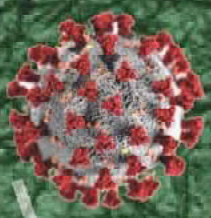

Our Activities

- An Association with over 600 members from India and abroad working since last 68 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 60 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 (IULTCS)]

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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

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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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Leather Fraternity 71 years of service to the International

COP 26 – At a Glance

The United States joined nearly 200 other countries in the 26th annual United Nations Conference of Parties in Glasgow, or COP26, to address climate change.

The summit resulted in the Glasgow Climate Pact (GCP) — agreed to by all participating countries — as well as various pledges among the parties.

If followed, the commitments made to date, including those established through the GCP, the United Nations Paris Agreement's nationally determined contributions, and others, could limit the growth of atmospheric temperatures to less than 2 degrees Celsius.

The GCP serves as reminder, however, that commitments alone do not deliver the change necessary to limit climate change; without the appropriate policies, investment, and technologies, any agreements are likely to fail to achieve their stated aims.

The United Nations Conference of Parties met in Glasgow from October 31-November 13 for its 26th annual summit (often referred to as COP26). The summit resulted in the Glasgow Climate Pact (GCP), agreed to by all of the nearly 200 participating countries, intended to strengthen the global commitment to addressing climate change, as well as various pledges among participants to address particularly carbon intensive industries.

While the GCP includes some novel language, it does little more than suggest that more aggressive commitments are necessary to abate climate change and prevent atmospheric temperatures from growing more than 2 degrees above pre-industrial levels as established under the Paris climate agreement.

According to the Climate Action Tracker, current climate policies are not being implemented at a rate sufficient to prevent temperatures from rising more than 2 degrees Celsius. Instead, the current pace of implementation would allow temperatures to rise 2.7 degrees Celsius above pre-industrial levels by 2100.

On the other hand, if all pledges, targets, and nationally determined contributions (NDCs) undertaken to date were implemented fully and in the agreed-upon timeframe, this would reduce the expected global temperature increase to 1.8 degrees Celsius.[2] This suggests that current emissions reduction commitments reflect the scope of the problem, but without appropriate implementation, they will fail to adequately address it.

Each participating country agreed to revisit the emissions targets for 2030 provided in its NDCs to consider the implementation of more stringent targets. At this point, 80 percent of global emissions are covered by NDCs. The GCP was agreed to by all participating countries but lacks

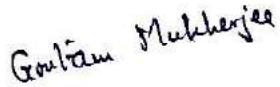
enforcement mechanisms. As a result, the GCP serves as a diplomatic means of benchmarking each country's commitment.

Efforts to meet emissions targets have seen limited success thus far, highlighting the challenge of meeting more stringent commitments. The emissions reductions in power generation in the past decade, now the second largest domestic contributor of greenhouse gas emissions, can be attributed to market forces rather than policy implementation. Due to improved production techniques and relatively low prices, natural gas largely replaced coal generation. The GCP is the first climate agreement to explicitly call for a "phase-out of unabated coal and inefficient fossil fuel subsidies." This language may prove challenging for the developing world, which still relies heavily on coal generation. China, which has developed a significant coal generation fleet in recent years, has pledged to stop financing the construction of coal power plants abroad. The GCP did not establish outright commitments by the developed countries to fund the GCP Adaptation Fund or the Least Developed Countries Fund. Instead, it "urges developed country Parties to at least double their collective provision of climate finance for adaptation to developing country Parties from 2019 levels by 2025." More specific financial commitments were pledged by developed countries, however.

COP26 resulted in not only an official agreement but also a series of commitments to various mitigation and conservation efforts, including a deforestation pledge, a methane abatement pledge, an agreement to end overseas financing of oil and gas projects, and a steel and aluminum trade agreement.

The United States committed to lifting tariffs on aluminum and steel produced in the European Union (EU) which is relatively less carbon intensive than similar products produced in China. Tariffs remain in place for other producers, including China, reflecting the Biden Administration's desire to incorporate climate policy in international trade. For more, see Tom Lee's analysis. The United States and EU also launched the Global Methane Pledge to reduce global methane emissions by at least 30 percent from 2020 levels by 2030; over 100 countries have joined. The Biden Administration recently proposed additional regulation of oil and natural gas producers' methane emissions (for more see Dan Bosch's analysis). Efforts to specifically address larger emitting sectors, such as agriculture and waste, have been less pointed. The United States, in conjunction with about 20 other countries, pledged to stop public financing of unabated oil and gas projects by next year. The pledge allows countries to grant exemptions and potentially fund projects that employ carbon capture technology, reflecting the realities associated with currently available technologies and continued reliance on the internal combustion engine.

Finally, the United States, along with over 100 other countries, committed to reverse deforestation by 2030. In addition, a dozen wealthy nations, including the United States, committed to providing $12 billion through 2025 to address deforestation in the developing world. Despite a similar agreement in 2014, the rate of deforestation increased. COP26, like the summits before, has resulted in various international commitments and highlighted the growing urgency of addressing climate change. The GCP serves as reminder that commitments alone are insufficient to limit climate change. Without the appropriate policies, investments, and technologies, the growth of atmospheric temperatures may continue beyond 2 degrees Celsius.



Dr. Goutam Mukherjee
Hony. Editor, JILTA

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.

campus.stahl.com

stahl campus

Tanners are facing growing environmental challenges as the market increasingly demands that high-quality leathers are produced more responsibly. Contributing to a more ecological leather production process, our responsible beamhouse portfolio helps tanners meet these challenges without compromising on the quality of the leather.

The Stahl BeTan® portfolio consists of a complete range of responsible solutions for every step in the beam house and tanning process, from soaking to liming and bating. Using the best-in-class responsible technologies from the Stahl BeTan® portfolio, tanners can reduce their water consumption and the amount of sulfides, solids and salt used during leather production.

Moreover, it can result in a shorter production process. Building on years of experience in beam house operations and acquiring the best technical experts in the world, Stahl has become the go-to partner when it comes to sustainable beam house and tanning solutions. Our Stahl BeTan® solutions demonstrate Stahl's continuous commitment to Responsible Chemistry, aimed at reducing the environmental impact of leather-making.

If you would like to know more about Stahl BeTan®, and what we can do for your business, visit **stahl.com** or contact **david.sabate@stahl.com**

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stahl

STAHL'S NEW CEO, MAARTEN HEIJBROEK, REFLECTS ON HIS FIRST 100 DAYS IN THE DRIVING SEAT

"I've been thoroughly impressed by the Stahl culture" - Heijbroek

How would you sum up your first 100 days in a sentence?

In the first three months I have tried to learn as much as I can about our company, our customers, our markets, and our technologies, since Stahl's markets were new territory to me.

What have you been up to?

I've paid visits to all Stahl sites around Europe as well as our operations in Mexico. I've also met many customers, mostly in person but some online. Unfortunately, I've not been able to visit all of our overseas locations yet due to COVID-19 restrictions, but I cannot wait to meet them in person soon. And together with the Stahl Leadership I am working hard on Stahl's strategic roadmap for the next decade.

Has anything surprised you or given you more confidence for the road ahead?

I've been thoroughly impressed by the "Stahl culture". What's really shone through in all the conversations I've had is that Stahl is a very entrepreneurial organization with a very high level of customer intimacy. Our slogan, "If it can be imagined, it can be created", really sums up what this company is about. Likewise, the team spirit I see among employees is very strong.

Have you noticed particular challenges?

It's a challenging period for the entire industry right now. The current economic rebound is creating supply-side issues in the form of severe raw material shortages and surging prices for chemical ingredients as well as energy. Meanwhile, a global shortage of shipping containers has further disrupted chemical supply chains. We must continue to address these issues head-on to minimize the impact on Stahl's customers.

Looking beyond the immediate horizon, our industry is undergoing a major transition as our customers and other stakeholders move toward more responsible and environmentally friendly ways of working. The recent announcements by automotive OEMs regarding new sustainability targets for their interior materials is just one example of this shift in mindset. Stahl is well positioned to meet the changing needs of different industries – we offer world-class expertise in coatings for flexible substrates, and we can match this with a robust sustainability proposition, as demonstrated by our recent Eco-Vadis Gold rating.

Stahl will celebrate its 100-year anniversary nine years from now. What kind of company is Stahl, almost a century on from its establishment?

I can point to only a few companies in our industry that have stayed successful over such a long period. We are in a very strong position heading into our second century, but it's important that, as a company, we don't get complacent and that we keep reinventing ourselves.

With the future ever more difficult to predict, Stahl needs to remain agile and flexible to stay relevant for tomorrow's customers and their needs. We must continue to build on our technological strengths and work hard to earn our place in a much more sustainable world.

Stahl's ambition is to be the go-to partner at the centre of a truly sustainable value chain, providing high performance coating layers for any flexible substrate. It's up to us to take our customers by the hand and lead them into a new responsible world!

(Stahl News – 14/10/2021)

STAHL TAKE STEPS TO ENSURE QUALITY WITH LEATHER CHEMICALS PRICE INCREASE

Stahl, an active proponent of responsible chemistry, is raising its prices for all wet-end and leather finishing chemicals worldwide by 15% with immediate effect.

This price adjustment follows continued growth in input costs within the chemicals industry, including rising prices for key raw materials, commodities, and freight services. The adjustment also takes into account strong global inflationary pressures affecting the wider global economy.

By increasing prices for its range of its wet-end and leather finishing chemicals by 15%, Stahl can continue to guarantee exceptional product quality for its customers around the world, as well as the highest levels of customer service. The increase also supports Stahl's commitment to shaping a better chemicals industry, including its continued investment in sustainable processes and renewable feedstocks.

Stahl representatives will be contacting customers directly to discuss the impact of the price increase.

(Stahl News – 22/10/2021)

From the desk of General Secretary

LEXPO IN KOLKATA AND SILIGURI

- After a thorough review of the Covid situation and discussion with ILPA (the organizing partner) time to time, the Kolkata LEXPO – XXXXI has been planned to be organized at Kolkata Ice Skating Rink from 8th to 16thJanuary' 2021.

  A brochure and the T & C have been started to be circulated among the prospective participants.

  Booking of the stalls have been started besides the other arrangements are under process.

- The Siliguri LEXPO – XXVI was proposed to be organized at Kanchanjunga Krirangan adjacent Ground, Siliguri from 26th December'2021 to 10th January' 2022. Provisional allotment of the ground was obtained. A few days back the competent authority for ground allocation has informed us that due to some unavoidable circumstances the ground is not available for the aforesaid period. Discussion is going on for the next possible period to organize the event, which is subject to be approved by the Executive Committee.

However, latest progress and status report regarding organizing both the proposed fairs will be informed in due course.

(***Susanta Mallick***)
General Secretary

x

Read and Let Read :-

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.

RECEIVING HARD COPY OF JILTA EVERY MONTH

Members want to have the hard copy of JILTA every month or any particular issue, kindly inform us by email or post, whichever is convenient.

In case we do not receive any communication from you for a hard copy, we will continue sending e-copy of the same to your email id available with us. You may please verify your 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. : 24413429 / 3459. 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.

General Secretary and the Members of the Executive Committee are available to interact with members at 19.30 hrs, over Phone / Conference call on every Thursday

ILTA
Since 1950

INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION

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

presents

THE HERITAGE LEATHER FAIR

LEXPO XXXXI

LEXPO-XXXXI

Exhibition cum sale on
Export Quality Leather Products

at

CALCUTTA
ICE SKATING RINK

● Date : 8 - 16 January' 2022 ● Time : 11 am to 8 pm every day

in collaboration with

for details please contact

Indian Leather Technologists' Association
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E-mail : admin@iltaonleather.org; mailtoilta@rediffmail.com
Website : www.iltaonleather.org

LAYOUT PLAN KOLKATA LEXPO - XXXXI

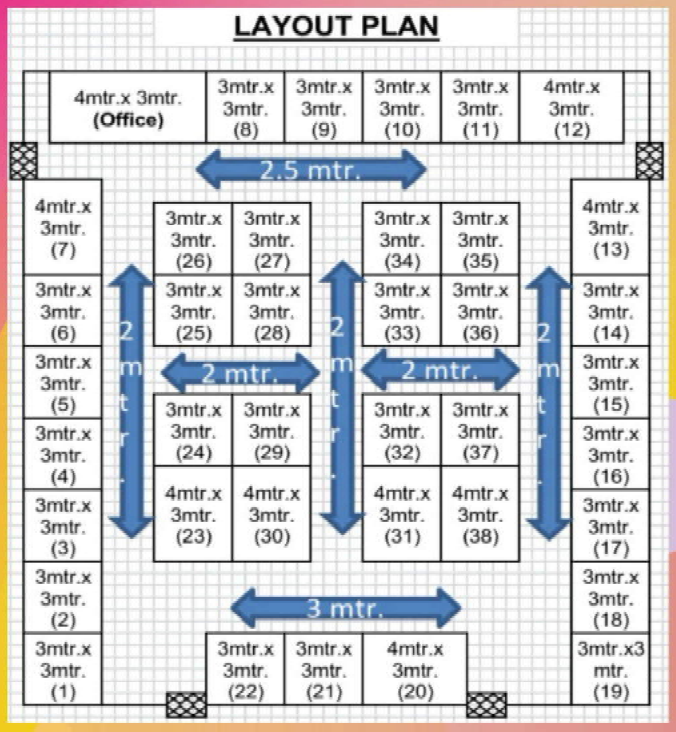
LEXPO-XXXXI

This year LEXPO is going to be organized by ILTA in collaboration with ILPA at Kolkata Ice Skating Rink from 8th to 16th January' 2022.

Most of the participants will be manufacturer and exporter of genuine leather products to Europe, UK and USA for the top running brands of the World.

Therefor the exhibited products will be of highest quality made of genuine leather produced in a pollution free environment and at quite reasonable cost to clear out their surplus stock.

The visitors will get the opportunity to come across top quality leather made products sold in different corners of the World and will be able to buy at reasonably attractive price.



LEXPO A OVERVIEW

LEXPO – Leather Exposition to reach people interested to know and buy genuine leather products.

ILTA has been organizing LEXPOs to promote and provide marketing facilities to keep pace with the latest design and technology to have better interaction with the domestic buyers of leather goods as well as providing the marketing outlet to the quality leather goods manufacturer. ILTA has been organizing this leather trade fair since 1977 in Kolkata, since 1992 at Siliguri and since 2010 at Durgapur and also in other states like Jharkhand, Orissa, Assam, Sikkim etc.

LEXPO was a total leather exposition in the National level and used to be conducted in star hotels up to year 1981 as Buyer/Seller Meet. In the year 1982, LEXPO was reoriented to reach out to the domestic market along with the export market and was shifted to the open ground of Kolkata Maidan. And thereafter in different grounds like Yuba Bharati Krirangan, Park Circus Maidan & Geetanjali Stadium etc.

Today LEXPO has become a popular people's fair and provides the visitors / buyers a very wide range of options to select the products made of genuine leather as per their taste and budget.

ILTA

Indian Leather Technologists' Association previously known as Leather Technologists' Association (India) was formed in the year 1950, under the Presidentship of Prof. B. M. Das and General Secretaryship of Prof. Moni Banerjee. It was incorporated in the year 1957 under Indian Companies Act' 1956.

The prime motto of the association was to work with all segments of people sincerely devoted to the cause of Leather and allied Technology all around the World. Through the Regional Centers, ILTA strives to bring the Technologists around the country closer together and now have more than 600 members in different categories country and worldwide.

In the past the Association has been headed by many stalwarts, like Padmashri Dr. Y. Nayudamma, Padmashri Nagappa Chettiar, Mr. V. P. Pandit, Mr. S. P. Pandit, Mr. Sanjoy Sen a past IULTCS President who are reckoned with great respect in the Leather Industry.

ILTA represents the country as one of the Member Society of the "International Union of Leather Technologists and Chemists Societies (IUTCS)" the foremost body of its kind in the world since 1956.

ILPA

The Indian Leather Products Association (ILPA), established in 1987, is a premier representative body of manufacturers and exporters of leather and leather products across the country with head office in Kolkata and a Regional Office in Chennai.

ILPA works actively to bring together manufacturer–exporters and merchant-exporters of leather products of India on a common platform to stimulate growth and development of the leather sector.

It strives to develop and maintain a reciprocal relationship with professional bodies, import associations and the Chambers of Commerce abroad in order to support and promote export of leather products.

It regularly undertakes the market surveys / studies in foreign countries, organizing and participating in International and National Trade Fairs / Exhibitions, Workshops and Seminars.

It strives to provide a host of services and activities to the leather goods industry at very reasonable charges.

It provides training and skill-development to the underprivileged youth of rural Bengal and helps them with job placements within the industry.

Kolkata is a major production hub of premium quality leather goods supplying to many renowned brands and retail departmental chains across the world and almost all the major units are the members of ILPA.

Major Activities and Achievements of ILTA

- ILTA has been publishing a technical journal, known as "Journal of Indian Leather Technologists Association (JILTA)" and now getting published on monthly basis since 1959 with a Worldwide circulation.
- Other than publication of Journals & Directories, ILTA has published the following Text & Referral books also for the students of Leather Technology:
  - "Analylical Chemistry of Leather Manufacture" by Prof. P. K. Sarkar,
  - "An Introduction to the Principles of Leather Manufacture" by Prof. S. S.Dutta,
  - "An Introduction to the Principles of Physical Testing of Leather" by Prof. S. S. Dutta,
  - "Practical Aspects of Upper Leather" by Mr. J. M. Dey,
  - "Comprehensive Footwear Technology" by Mr. Somenath Ganguly,
  - "Treatise on Fatliquors & Fatliquoring of Leather" by Dr. Samir Dasgupta,
  - "Synthetic Tanning Agent" by Dr. Samir Dasgupta,
  - "Handbook of Tanning" by Prof. B. M. Das
- ILTA as the pioneer organization in Indian Leather Industry organized few of many events since its inception:

  1956 – First All India Leather & Allied Products Exhibition at Indian Museum, Calcutta.

  1956 – The first symposium on Chrome Tanning under guidance of Prof. B. M Das & Mr. Sanjoy Sen.

  1960 – Published the first All India Leather Directory.

  1999 – The International Congress of IULTCS at Chennai for the first time in any Asian Country in support of CLRI.

  2001 – The first South Asian Conference during Golden Jubilee Celebration.

  2004 –The first initiative to unite the industry into a hub through formation of CLCTA and played an important role, being an integral part of the CLC Implementation Committee formed by the State Govt., for implementation and its inauguration in 2005.

  2010 – The 8th Asia International Conference of Leather Science & Technology at Kolkata during its Diamond Jubilee Celebration.

  2013 – Series of lectures arranged in Kolkata under the title "PrIEST" [Programme for Implementing Emerging and Sustainable Technologies].

  2017 – The International Congress of IULTCS at Chennai for the second time in support of CLRI.

  All these were separate milestones to earn the jewels on its crown.
- ILTA observes its Foundation Day celebration with "Prof. B. M. Das Memorial Lecture" on 14th August, "Sanjoy Sen Memorial Lecture" on 14th January, Prof. S. S. Dutta Memorial Lecture on 2nd February and Prof. Moni Banerjee Memorial Lecture on 15th March, when besides delivering prestigious memorial lectures, our Association felicitates the toppers (1st Class 1st) of M.Tech & B.Tech in Leather & Leather Footwear Technology Examination from different institutes countrywide.
- ILTA has been organizing since 1977, trade fairs & exhibitions of Leather, Leather Goods & Allied Products in different part of country under the trade name of LEXPO, to create mass awareness about utility of leather and leather products and providing a direct window for interaction among the end users and manufacturers for their self-sustainability and development.
- ILTA organizes HRD Programs for Skill Development and Technological Upgradation (STUP) and artisan and skilled manpower training with the objective of making themself-employed and to cater to the industry in a better way.
- In different times ILTA organizes seminars / webinars and workshops to benefit the industry about technological advancements and developments. It also offers services to the Union and State Governments in various advisory capacities and is an integra part of Bureau of Indian Standards.
- The members of our Association are attached to different councils and governing bodies of technological institutions where they have commendable contributions.

ILTA
Since 1950

Indian Leather Technologists' Association

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

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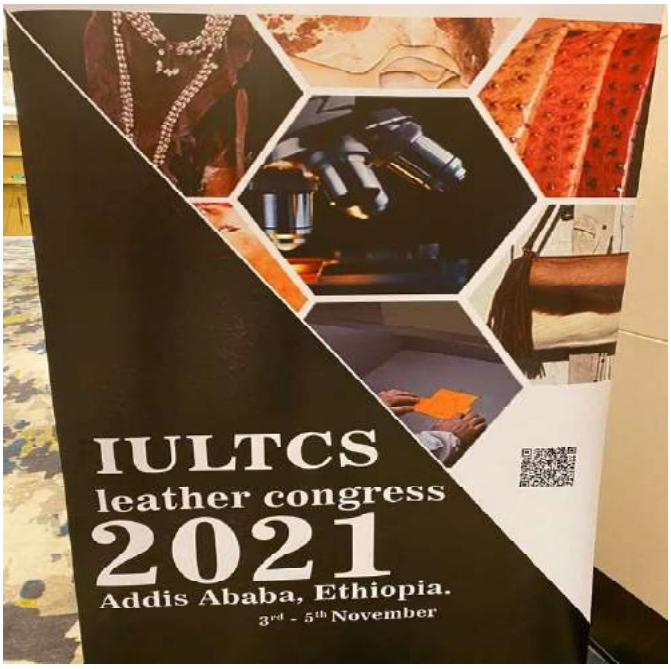
INTERNATIONAL UNION OF LEATHER TECHNOLOGISTS AND CHEMISTS SOCIETIES

THE XXXVI IULTCS BIENNIAL CONGRESS IS SUCCESSFULLY COMPLETED



The XXXVI biennial Congress of the International Union of Leather Technologists and Chemists Society (IULTCS), hosted by Africa Leather and Leather Products Institute (ALLPI) in conjunction with the Ministry of Industry of Ethiopia, from 3rd to 5th November, 2021, has been successfully completed at the Skylight Hotel, Addis Ababa, Ethiopia.

Due to the COVID-19 pandemic limitations, the IULTCS Congress, was conducted in a hybrid mode, with both face-to-face and online participants, for the first time in the Union's 120 years' experience. The three-day Congress was attended by over 240 participants from many countries from all continents. A total of 36 oral and more than 70 poster presentations were made on diverse areas of technology, chemistry and science of leather making and environmental sustainability. The online system also facilitated recordings of all presentations and discussion, which will remain available to registrants for reviewing at their leisure during the next two months.

The Congress was steered by the ALLPI Expert Team led by Professor Mekonnen Hailemariam, with 16 well-known scientists, researchers and professionals in the leather sector as moderators from across the different continents.

At the official opening ceremony of the Congress the IULTCS anthem was played and the Union's flag was raised. Welcome messages and a keynote speech were provided by Mr Ghebregziabher Ghebremedhin, Acting Executive Director, ALLPI, Dr Luis Zugno, President of IULTCS and His Excellency Mr Tekalegn Bululta, State Minister, Ministry of Industry, the Federal Democratic Republic

of Ethiopia. The opening was followed by the presentation of the IULTCS 2021 Merit Award for Excellence in the Leather Industry and then the prestigious keynote lecture of the Congress, the Heidemann Lecture.

IULTCS 2021 Merit Award for Excellence in the Leather Industry was presented to Dr T Ramasami, renowned for his very significant contributions to the chemistry of chromium as a scientist and his leadership in the Indian leather sector for many years.

The Heidemann Lecture was delivered by Professor Anthony Covington, who has authored over 300 technical publications, received the IULTCS Merit Award for Excellence in the Leather Industry in 2009, and the Alsop Award for Outstanding Scientific Contribution to the Leather Industry from the American Leather Chemists Association in 2011.

Following the official opening and the Heidemann's Lecture, the three days were divided into different sessions for oral and visual poster presentation of scientific papers. The scientific papers presenters were from all over the world and participants had the opportunity to ask them questions directly on-line and make comments. All the sessions went smoothly in a hybrid mode. The presenters were also honored with a certificate of merit.

Day 1 had 3 oral and 2 poster sessions. A total of twelve papers were presented in oral sessions; they presented new developments with regards to cleaner technologies for the leather processing, composite

materials and utilization of leather waste resources, and Environmental Management Technologies in the leather industry.

Day 2 followed with 4 oral and 3 poster sessions. The papers presented in the oral sessions were 16 in number and focused on the areas of intelligent manufacturing of leather products, cleaner technologies for the leather processing, leather chemicals. As well as Environmental Management Technologies, leather industry entrepreneurship and progress towards sustainability.

Day 3, the final day, had 2 oral and 2 visual poster sessions. The topics and contents of the orally presented scientific papers, that were 9 in number, focused on the areas of scientific research of leather and fashion, life style leather products and design innovation.

At the closing ceremony of the Congress the IULTCS anthem was played and the Union's flag was handed over to the host of the next Congress, which is the China Leather Industry Association (CLIA). This was followed by a vote of thanks by Dr Wolfram Scholz from Austria. Closing remarks by ALLPI Acting Executive Director Mr. Ghebregziabiher Ghebremedhin, ALLPI Board of Directors Chairperson, Mr Sekandi Abdul Hakim, and closing speeches by the incoming President of IULTCS, Mr Jean-Pierre Gualino and the current President of IULTCS, Dr Luis Zugno.

All the speakers expressed their satisfaction with respect to the level of organization of the Congress, the diversity of the topics discussed and by the in-depth insight gained in the different aspects of the leather making and environmental sustainability. Organisers also thanked the Gold sponsor, TFL; the silver sponsor, Pittard's and the bronze sponsors JICA, Chromogenia, ATC, Buckman and Ethiopian Airlines.

UN environment

International Resource Panel

Green Technology Choices:

The Environmental and Resource Implications of Low-Carbon Technologies

INTERNATIONAL RESOURCE PANEL REPORT

Solidaridad

Solidaridad Network is a global civil society organization providing efficient, scalable and economically effective and innovative sustainability solutions in various agricultural and industrial commodities such as:

Tea | Sugarcane | Soy | Leather | Livestock | Gold | Textile | Fruits & Vegitable | Dairy | Cotton | Aquaculture | Castor | Palm oil

switchasia
GRANTS PROGRAMME

EFFECTIVE WASTE MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN KOLKATA LEATHER CLUSTER(BANTALA)

2020 -2023

Circular Economy

Effective solid waste management

Capacity building programme

EFFECTIVE WASTE MANAGEMENT AND SUSTAINABLE DEVELOPMENT
KOLKATA LEATHER CLUSTER

Trainings on Occupational Health and Safety

Robust public- private partnership

Efficient water consumption practices

PROJECT PARTNERS IN ASIA

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Let's Talk About Green Approach

Mr. Tatheer Zaidi

General Manager, Pollution Management in MSMEs, Solidaridad Asia

1. What inspired you (Solidaridad) to work towards the sustainable development of the leathersector?

Leather is a very important and dynamic sector. It falls under the top 10 export commodities and contributes significantly towards the GDP of the country. It has a large workforce of about 4.42 million people. Despite the strong growth drivers, the sector faces several challenges related to pollution owing to the very nature of its production. It suffers the risk of losing its credibility and competitiveness, which has a cascading effect on the employment rate as well. Thus, adopting advanced and clean technologies with clear business cases is now the only plausible path to the industry's recovery and survival.

Solidaridad has a rich experience in promoting sustainable supply chain management. Recognizing the scope of improvement in the leather sector, we planned and created a multi-stakeholder initiative, bringing together national and international partners to introduce techno-commercially proven innovations to overcome the major challenges related to pollution, water and waste management issues in the sector. The approach is directly complementary to the larger mandate of the Government of India's National Mission for Clean Ganga. It is also aimed at helping the industry revive from regular closures and improve its business case in the international markets.

2. Your journey with the leather industry began in Kanpur, Uttar Pradesh, India. How did it start and how difficult or easy was it to initiate the project and implement it through?

In 2017, Solidaridad realized the need to initiate efforts in one of the most significant leather geographies in India — the Kanpur-Unnao belt — which is also widely connected to the global market. Since the region was considered to be one of the priority industries in the Clean Ganga Mission, it became imperative to formulate a meaningful consortium to bring about a real impact. With immense support from the Embassy of the Netherlands in India, the five-year project titled 'Pollution Prevention and Efficient Water Use in Kanpur Unnao Leather Cluster' was conceived with aflgroup of partners and a focus on introducing national and international best practices to minimize pollution arising from the leather supply chain. We received overwhelming response from industry stakeholders to conduct different kinds of technological interventions and garnered constant support from government entities such as the National Mission for Clean Ganga (NMCG), Central Pollution Control Board (CPCB) and Uttar Pradesh Pollution Control Board. Owing to the widespread acknowledgment from both public and private partners, the project was scaled up to the Kolkata leather cluster in 2020

3. What were the major breakthroughs/ achievements accomplished?

With the support of project partners, we worked towards providing technical solutions to Environmental, social and economic issues, while arriving at market-based solutions for the inter-connected challenges. Along this journey towards sustainability, the NMCG acknowledged Solidaridad as its official sustainability partner and encouraged us to scale up similar models for other sectors, including the dying and bleaching/textiles, pulp & paper, pharmaceuticals, etc. During their travel to India, His Majesty King Willem-Alexander and Her Majesty Queen Maxima of the Kingdom of the Netherlands appreciated Solidaridad's flagship initiative at the Tech Summit in New Delhi on 15 October 2019.

Out of the several interventions introduced, the utilisation and transformation of tannery sludge into paver blocks, the desalting of hides and the PETP upgradation are among the breakthroughs so far that have been hailed and endorsed by the government bodies.

Solidaridad was also conferred the EEF Global Industrial Water Awards 2021 for introducing an innovative water optimization measure that reduces the freshwater consumption by 50 per cent in the fleshing process.

With acknowledgement and widespread support from both public and private partners, Solidaridad has scaled up its efforts to Kolkata under the European Union- Switch Asia project. The Hon'ble Chief Minister of West Bengal, Mamata Banerjee, launched the project in the presence of senior delegates and ambassadors from the European Union, Italy, the Netherlands and Germany.

Solidaridad is now formalising the process of initiating efforts in the Tamil Nadu leather clusters, therefore having a footprint in three out of the four major clusters in India.

4. What are the next-level plans for the region or is it already functioning in an auto-pilot mode?

As mentioned earlier, we have been receiving overwhelming response from the industry, acknowledging that most of our demonstrations are techno-commercially viable. We are optimistic that the interventions demonstrated will be adopted at a cluster level. It has already been adopted by several tanneries in the region after we demonstrated range of pilots in more than 100 tanneries. We are confident that the Kanpur-Unnao leather industry will continue on the path of sustainability through the techno-commercially viable practices we have introduced. More so, as it will help them further enhance their competitiveness in the international market.

5. How did the project at the Kolkata leather cluster come about?

The successful implementation of the Kanpur-Unnao project motivated us to explore the possibilities of scaling up the efforts to other important leather geographies in India. With Kolkata being on top of the list, we discussed the possibility of a project with the Calcutta Leather Complex Tanners' Association (CLCTA). CLCTA has been very optimistic on transforming the Kolkata leather cluster and re-asserting it as a leading sustainable leather geography in Asia. Solidaridad partnered with CLCTA, PISIE, Dugros and Stahl who share a common vision of transforming the Kolkata leather industry into a model cluster. We also received a great support and encouragement from Department of MSME, Government of West Bengal on paving way for the vision.

The project was inaugurated by Madam Mamata Banerjee, the honorable Chief Minister of West Bengal on 23rd September 2020. The virtual launch was marked by the presence of the ambassadors from the European Union, the Netherlands, Italy and Germany.

6. What is the focus of the interventions in Kolkata?

The focus of the ongoing project in Kolkata is to:

a. Scale up proven technical interventions to minimize the parameters of effluent like TDS, BoD, CoD, TSS etc. within the tanning processes;

b. Establish sizeable pilot demonstrations to convert different kind of solid waste coming out from tanneries, such as tannery sludge, fleshings, leather cuttings/trimmings, buffing dust etc., into valuable products citing examples on circular economy;

c. Conduct capacity building activities for tannery workers on adoption of best occupational health and safety practices;

d. Develop multi-stakeholder platforms to establish uniform communication;

e. Establish linkages with international technical entities to address demand-side challenges.

7. How do you link the ongoing project with the Social Development Goals?

Our initiatives, through the inter-related packages, are directed at achieving mainly SDG 1 ('No Poverty') and SDG 8 ('Decent Work and Economic Growth') through creation of green jobs and increasing the competitiveness of the industry. The interventions are also directly aligned to SDG 6 ('Clean Water and Sanitization') and SDG 12 ('Responsible Consumption and Production'), which also have an effect on SDG 13 ('Climate Action'). The project is working through a public-private partnership approach and is thus aligned to SDG 17 ('Partnership for Goals')

8. After Kanpur and Kolkata, which is the next geography on your radar?

There is still a need to scale up and strengthen the efforts on pollution abatement within India and Bangladesh. We are in the process of approaching an important geography in India, Tamil Nadu, and have been receiving encouraging response from the respective stakeholders and industry associations.

We are willing to scale up the learnings to the SAARC nations as well as a part of Solidaridad's Multi Annual Strategic Plan 2021-2025. We are also working in the leather clusters of Ethiopia.

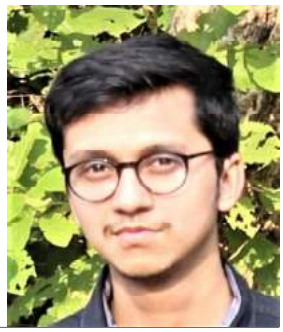
9. How is Solidaridad placed on the pollution agenda in Asia? What is the long-term strategy?

We are thankful to have received encouragement from the National Mission for Clean Ganga, Government of India. The NMCG has also inspired us to scale the learnings received from India to the SAARC regions and has already given the consent to be our formal partner in the project.

Solidaridad has presence in nine countries in Asia and there are countries within the SAARC region where the MSME sectors located along river basins have similar issues like that of India. Solidaridad has a problem to solution approach as has been exhibited in the current projects.

We are in constant touch and willing to facilitate government-to-government cooperation with these countries. We seek to implement meaningful programme to create a positive impact on the larger part of the communities residing in developing countries.

CONCEPT OF ROBOTICS IN AUTOMATION



Mr. Arpan Mallick[1], Mr. Susanta Mallick[2], Dr. Goutam Mukherjee[3]

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2 - MD, Alcems Marketing Pvt. Ltd., Kolkata & General Secretary, ILTA

Abstract :

We all know that technology has advanced a lot since ancient times. According to people, the ultimate development may be the AUTOMATION in everything, where humans do not have to work hard all day. Humans are working hard all the day NOW, so that they can sit back and relax LATER. Robotics would be implemented first in industries, because that's where I think development begins and leather industry involves machines in each and every operation to get the final product.

Introduction :

Robotics is a sub-domain of engineering and science that includes mechanical engineering, electrical engineering, computer science, and others. Robotics deals with the design, construction, operation, and use of robots and computer systems for their control, sensory feedback, and information processing. A robot is a unit that implements this interaction with the physical world based on sensors, actuators, and information processing. Industry is a key application of robots, or to be precise Industry 4.0, where industrial robots are used.

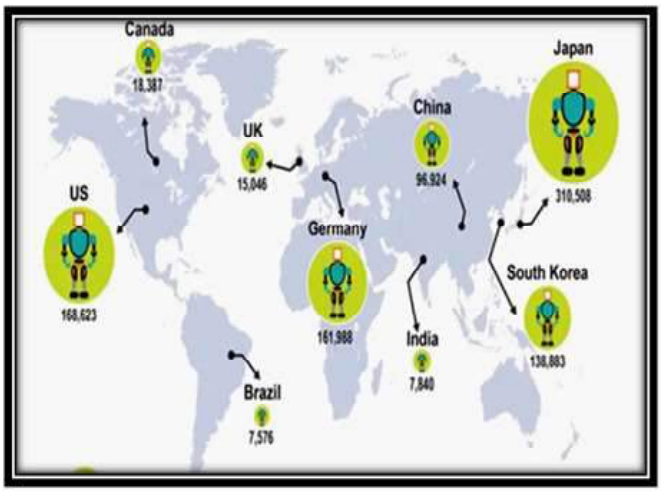
It is an interdisciplinary field that integrates computer science and engineering. It Involves design, construction, operation and use of robots can design machines that can help and assist humans. It can be used in numerous fields e.g.

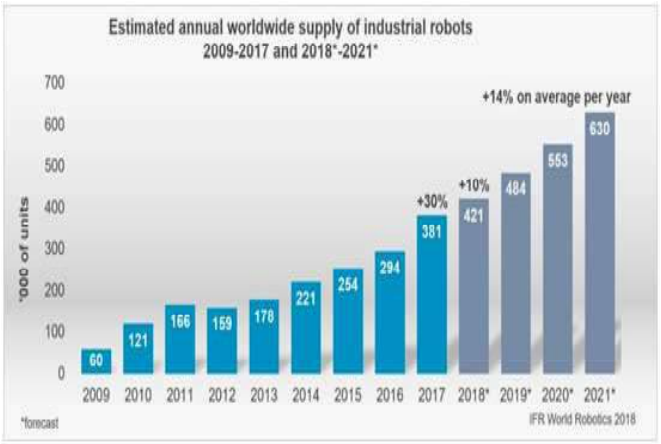
- Electronics
- Computer Engineering
- Bio Engineering
- Manufacturing Sectors, etc.

Statistics of Robotics in the World :

In this context, there is an Industrial Robot Sales report by International Federation of Robotics : Global industrial robot sales increased 15% around 2019-2020 with 75% of total sales volume from 5 countries – China, Korea, Japan, US and Germany.

Sales of robots in India are less compared to the majority but it has also undergone a decent rise in sales. Robotics is nascent in India with start-ups like Shastra Robotics, Gridbots and Systemantics solving automation tasks with home grown affordable robots.





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Why is Automation Important ?

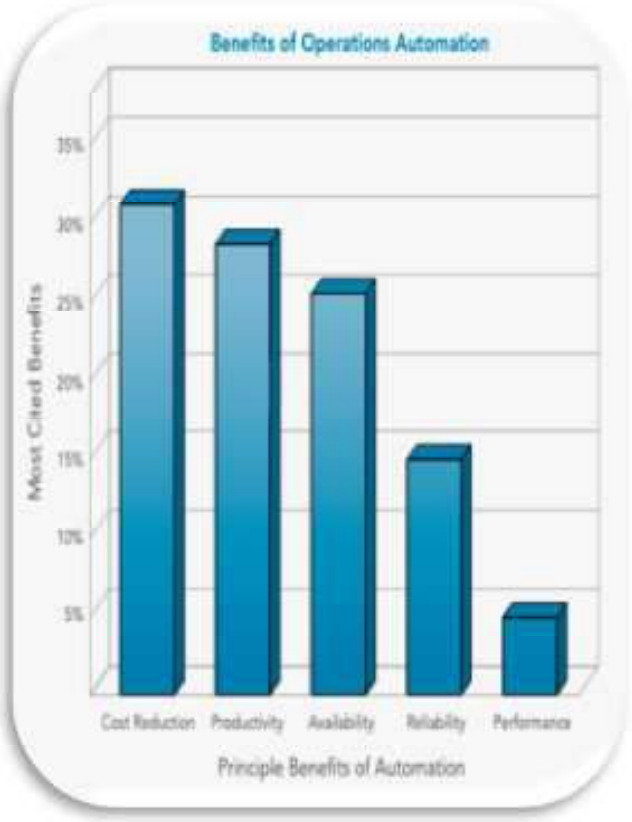
Delegation of human control function to technical equipment for

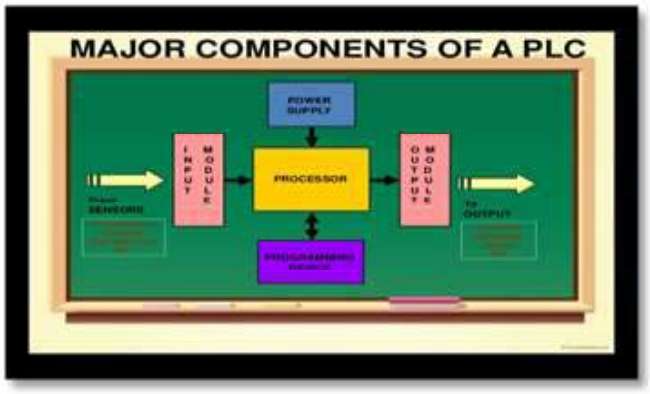
- Increasing productivity
- Increasing quality
- Reducing cost
- Increasing safety in working condition
- Reduced cycle time
- Reduced wastage of resources
- Less requirement of unskilled workers
- Longer working hours

PLCs :

Automation of many different processes such as controlling machines or factory assembly lines, is done through use of small computers, called a Programmable Logic Controllers (PLCs) .

It monitors input; make decision based on its program and controls outputs to automate a process or machine.





Few Applications of Robotics in Leather Industry :

a) Collaborated Robot Arms

These are one of the basic applications of robotics. These are able to learn the motion and path demonstrated by human operations. These robot arms can be useful in any operation of the industry whether switching on a machine or moving any object.

Live example, ABB robots are helping a small shoe factory take some big steps.

ABB is a robotics company whose robots are helping a small leather shoe factory to take some big steps.

Improved flexibility to cope with an expanding product range and reassurance of prompt service and support were two key factors that fascinated the shoe factory.

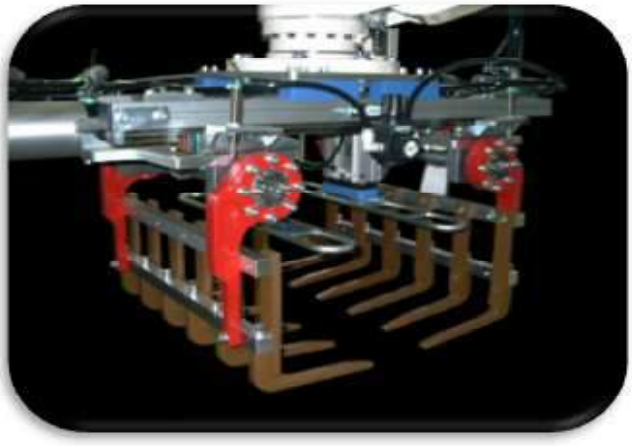
b) Leather Garments Industry

Sewing Machine – In many approaches and research projects, robots have been used to either guide the leather (sew bots) through the sewing process or movement of sewing head mounted to a robot. Compared to the production of composite materials, robots have not yet been established in leather garments production in such a wide range, mainly due to high investment costs. But, I think this step would lead to huge development of the leather garments sector.

Gripper – The robotic hand grasps and mates to the hanger, the group hand hanger reconfigures positioning the hanger clamps to desired points on the leather parts, picks

the part and connects to the hanger. The gripper is moved by a robotic arm.

- 3 actuated arms each with one picking/loading unit at tip.
- Central arm 1 dof; lateral arms 2dof accordingly to hanger motions.
- Distributed onboard generation of vacuum by new micro turbine modules.
- Interface to robotic arm and distributed control unit.
- Interface and docking system to hanger; full hanger management including reset and configuration, part loading, management of hanger graspers, release to transport system.
- 4bar linkages in lateral arms to drive picking modules.
- Design solutions for minimum mass



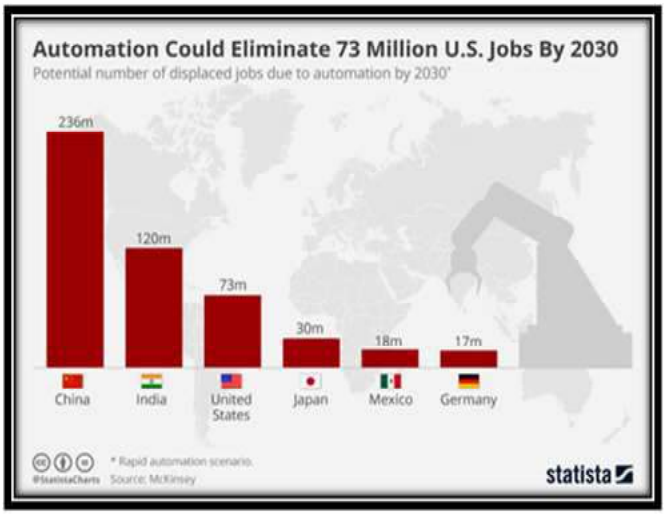
Cutting Table with Automatic Unloading – The robot dialogs with the cutting table, learns the position of cut parts, knows the needs of manufacturing, decides which parts to grasp, grasps, unloads, releases these parts to the other operations.

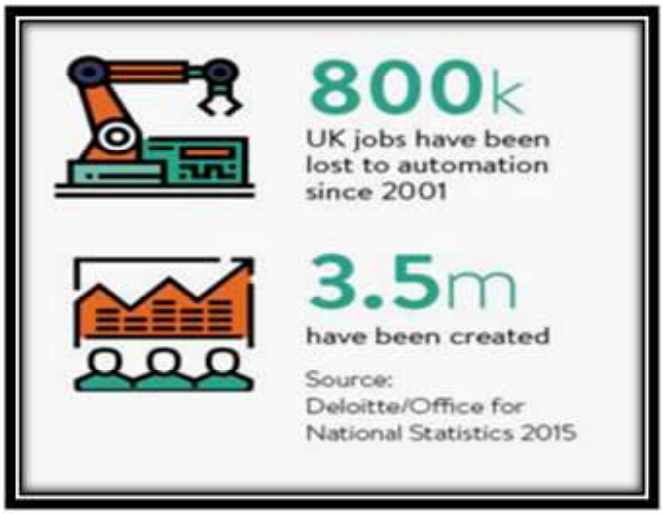
High Flow Vacuum Generator – In some cases, these can be used to obtain an adhesion between the leather parts by a high-flow of vacuum with depressor, control and every other functional component onboard to realize an independent module. Fabric is porous to air and delicate, especially garment types. The appearance of the surface is modified by any mechanical interaction comprising relative contact movements. Traditional vacuum solutions do not process an amount of air sufficient to obtain reasonable grasping force on fabric. Dynamic depressors are used to hold and grasp porous material but the architectures are generally centralized with one main generator and distribution channels. This limits the achievable flexibility. The innovation in the adhesion technology consists in the development of distributed dynamic depressors with low-cost that can be treated almost as Venturi-depressors in terms of complexity, size, mass, cost. These dynamic depressors can be distributed on any equipment with multiple picking points. The reliability of the overall system results improved because fail of one picking point does not compromise the overall functioning of the system as with centralized generators. A special features of the picking module developed is the adaptability to different materials with porosity to air in a large range without structural modifications to the module.

c) Automatic gluing, unloading, laminating and folding machines

Is Automation really necessary ?

- Loss of Jobs





The most common problem arising of it is the loss of jobs. But this may be not the case in all spheres. Due to automation, manufacture and sales of products rise, thus, opportunity for more pre-sales, implementation, logistics, installation and support jobs throughout the entire supply chain will no doubt be seen. This will give rise to a whole class of new jobs in manufacturing sectors that do not even exist.

Resultant Discussion :

Well, we think that automation with the help of robotics may lead to a better world for all of us in the near future, if we can utilize it in the right way. There are several reasons for its implementation in the leather industry and so, we can conclude that its usefulness can serve the mankind in a different way.

Tomorrow's robots, which includes the humanoid robot, can perform task like tutoring children, working as tour guides, driving humans to and from work, do the family shopping etc. Tomorrow's robots will enhance lives in ways we never dreamed possible. No time to attend the decisive meeting on Asian strategy? Let your robot go for you and make the decisions. Not feeling well enough to go to the clinic? Let Dr Robot come to you, make a diagnosis, and get you the necessary medicine for treatment. No time to coach the soccer team this week? Let the robot do it for you.

Tomorrow's robots will be the most exciting and revolutionary things to happen to the world since the invention of the automobile. It will change the way we work, play, think, and live. Because of this, nowadays robotics is one of the most dynamic fields of scientific research. These days, robotics is offered in almost every university in the world. Most mechanical engineering departments offer a similar course at both the undergraduate and graduate levels. And increasingly, many computer and electrical engineering departments are also offering it.

This book will guide you, the curious beginner, from yesterday to tomorrow. The book will cover practical knowledge in understanding, developing, and using robots as versatile equipment to automate a variety of industrial processes or tasks. But, the book will also discuss the possibilities we can look forward to when we are capable of creating a vision-guided, learning machine.

Collaborative robots or cobots are becoming increasingly important. In a growing number of areas in industry, conventional industrial robots are being replaced by or backed up with collaborative robots. Cobots work together with humans in production processes and are no longer kept separate from their human co-workers with protective devices, like typical industrial robots. Compared to traditional industrial robots, collaborative robots are smaller, can be used more flexibly, and are easier to program.

Cobots don't replace human workplaces, they supplement them. Paradigm Electronics in Canada is a example: Productivity was increased by 50 percent by using cobots, and not one single job was lost. Staff carries out new tasks in newly created areas of activity, such as programming the machines and quality control at the end of the automatic production process. Experts from the Boston Consulting Group assume that in the future the use of robots will increase productivity per employee by up to 30 percent.

Industrial robots

Industrial robots are programmable machines that are used to handle, assemble, or process work pieces in the industrial environment. Most of these robots consist of a robot arm, a gripper, various sensors, and a control unit. They can also carry out actions autonomously depending on how they are programmed. Global robot density has increased significantly over the last years: In 2015, on average there were 66 units per 10,000 employees, but this has now risen to 74 units. In Europe the average robot density is 99, in the US it is 84, and in Asia it is 63.

According to statistics from the IFR (International Federation of Robotics, the international umbrella organization of all national robotics associations) in 2016, with about 31,500 installed units, the US recorded an all-time high for industrial robots, a 15 percent increase over 2015. Worldwide in 2016 roughly 290,000 industrial robots were in use, 14 percent more than in 2015. This trend will continue in the future: Average growth of 12 percent p.a. is expected in the coming years.

Industrial robots in the automotive industry

In this key industry for robotics, machines have played an important role in automated production processes for more than 50 years to make workflows more efficient, safer, faster, and more flexible. The first industrial robot, Unimate, was integrated into the production process at General Motors in 1961. The robot was used there to remove injection molding parts. In 1973, the first industrial robot began working at VW in Wolfsburg, Germany. The in-house development, nicknamed "Robby" by its human co-workers, was used in the production process for the Passat. According to a statistical survey by the IFR (International Federation of Robotics, the international umbrella organization of all national robotics associations), more than 17,600 industrial robots were in use in the US in 2016, 43 percent more than in 2015.

Automated Guided Vehicles / AGV

An **AGV** is a driverless transport vehicle with its own drive that is controlled automatically and guided without touch. AGVs are typically used to transport materials in production facilities. In the industrial environment, they represent the development from the traditional, bulky conveyor belt to a space-saving, highly flexible solution. Warehouses are another popular operating place for AGVs, where individual goods or large ranges of goods are taken to defined packing stations where they are processed. This type of robot generally moves at approx. 1-2 meters per second and is able to transport payloads of up to roughly 2,000 kilograms. AGVs differ in terms of their power supply, the tasks they carry out and the navigation and routing process. Power is supplied either through a cable (for rail-mounted AGVs), the rail itself, or a battery. The battery is charged via a induction charging plate or at charging stations, where the batteries can also be replaced. Depending on their tasks and area of deployment, AGVs as forklifts can move pallets, as tractor units can tow trailers, or as moving cargo areas can transport boxes or packages. AGVs can, for example, be navigated by lasers, in which case the robots scan labels attached at certain locations so that they can find their next destination. Optical navigation via recognition of colors, etc., is another option. Antennas or rails are also used to steer AGVs. The most flexible units are autonomous AGVs that scan their complete surroundings and create virtual maps from the results. They are able to notify other AGVs about obstacles and generate the optimum route for transportation. AGVs are moved by one to four actively driven wheels, depending on their area of deployment and the required degree of movement.

Domestic robots

Lawn mowing, vacuum cleaning, or window cleaning: Robots can take over some of the everyday household chores. People are impressed by the time and work that they save: According to a study by the German Federal Association for Information Technology, Bitkom, 42 percent of the more than 1,000 people who took part in the survey could imagine having a robot in their home. More than 80 percent would like assistance for vacuum cleaning or washing floors, 41 percent would like a robot to help out in the garden. 15 percent of the interviewees already had a robot in their home.

Security robots

Although data protection and data security issues would have to be considered, 49 percent of the participants in the above-mentioned representative Bitkom survey could imagine trusting the security of their own home to a robot. A security robot looks after the household while the residents are on vacation, on a business trip, or at work. These robots can be controlled from an app via an Internet connection. If the robot senses impulses via motion detection, it sends an alert to a smart phone. The integrated camera makes HD recordings and has a two-way audio intercom feature.

Robots in the hospitality industry

Korean electronics group LG presented its new robot product series CLOi at the 2018 Consumer Electronics Show in Las Vegas. The Serving Robot model provides customers with food and beverages. It can be used round the clock (e.g. at airports, railroad stations, and in hotels) and serves meals on a tray that customers can take with them. When it has served the customer, the robot finds its way back to the service station to fetch new snacks and complete its next assignment.

Robots in the agriculture industry

Agriculture is another area that offers a lot of potential for robots. At present, pilot projects are being carried out in which robot arms and multi-spectral cameras installed on a harvester optimize the processes of cucumber harvesting. For seeding, small planting robots controlled from a tablet not only sow the seeds, they also document all the important information. Drones are suitable for monitoring the ripeness of vegetable products and weed growth and, if necessary, they can also spray critical areas.

Robots in medicine

As treatment aids, robots are especially used where patients have to learn how to reactivate their loco motor system after a stroke or neurological disease. People who suffer from paralysis learn to walk again and even climb stairs with the help of training machines. One robot can do the work of two therapists. Patients also receive direct feedback during the exercises. A wearable robot (exoskeleton) enables paralyzed patients to walk on their own. The step movements of the robot are triggered by the patients shifting their weight.

Robots in surgery

Robots are also found in operating theaters, where they do not replace the surgeon but are used as accurate assistants for minimally invasive procedures. Instead of using operating instruments such as scissors or forceps themselves, surgeons control a robot via a console with the help of a joystick and foot pedals. Procedures using an operation robot save time and are also less invasive for patients. Risks from human errors are minimized.

Toy robots

Aibo, the robotic dog from Sony, is an entertainment robot, which the company stopped selling in 2006 but reintroduced to the market in 2017 in a new version. Aibo perceives its surroundings with two cameras and microphones. The acquired data is evaluated by a learning program so that the robot dog can develop an individual personality. As well as Aibo, Roberta also belongs to the toy robot category. This initiative of the Fraunhofer Institute for Intelligent Analysis and Information Systems has been using special robots since 2002 to encourage children to take a playful approach to technology and to awaken their interest in the development and programming of robots.

Humanoid Robots

Humanoid robots are machines that are designed to look like humans. Joint positions and movements are inspired by the human locomotor system. This is also clear by the fact that humanoid robots usually move on two legs in an upright position. The main motive for research and development in the field of humanoid robots is artificial intelligence (AI). In most scientific fields, the development of a humanoid robot is deemed to be an important basis for the creation of human-like AI. This is based on the idea that AI cannot be programmed but consists of learning processes. Accordingly, a robot can develop artificial intelligence only through active participation in social life. However, active participation in social life, including communication, is possible only if the robot is perceived and accepted as an equal creature due to its shape, mobility, and sensors. With rollers rather than legs, but with her small size, pleasant voice, and sparkling, round eyes, Josie Pepper the robot is currently assisting passengers at Munich Airport in Germany. Munich Airport, together with Lufthansa, is one of the first airports to trial a humanoid robot live. Josie provides information about the current flight status, check-in information, and describes the way to the departure gate or the nearest restaurant. The development from French company Soft-Bank Robotics is connected to the Internet via WiFi and can thus access a **cloud** to process and analyze dialog and link it with the airport data. In this way, Josie learns from every dialog and answers questions individually.

So that people with no programming knowledge can also communicate with robots and give them instructions and information in a natural manner, interaction between humans and machines via voice, gestures, and facial expressions is very important.

Voice recognition

Even in the age of smart speakers, recognizing and interpreting natural language in real time is a highly complex process for a machine. This is due to variable factors such as surrounding acoustics, background noise, volume, dialects, accents, or the general pitch. At present, machines can recognize natural language with about 95 percent accuracy.

Gesture recognition

3D data capture in real time is needed for precise recognition and interpretation of human gestures with no latency. Scientists at the Fraunhofer Institute for Applied Optics and Precision Engineering are working on systems that record and process 3D data quickly. Two high-speed cameras and a color camera record images, while the special software converts them into 36 3D data records per second. The scientists have also developed learning software based on neural networks for the system.

Facial expression analysis

It is generally possible to make conclusions about how a conversation between two people is progressing on the basis of their facial expressions. This is also to be implemented in a dialog between humans and robots. Thanks to a flexible polymer and integrated servo motors, the faces of robots produced by Hanson Robotics are able to show a wide range of expressions. The aim is that the robots will adapt their interaction based on the facial expression of humans. For example, with an anxious expression, it should keep its distance to the person, and with a questioning expression, it should provide information.

Artificial emotions

In ongoing research projects, robots are being taught to recognize and understand human emotions and to respond accordingly. With the corresponding expressions and gestures, the robot can show or simulate emotions as a response to humans. One example of this is the Emotisk training system that scientists at Humboldt University of Berlin are currently developing in collaboration with the university hospitals of Aachen and Cologne in Germany: The software evaluates information such as line of vision and facial expressions and gives humans the corresponding emotional feedback. The system is designed to help persons with autism recognize the emotions of others and to respond by sending non-verbal signals.

Artificial personality traits

Because of their visual similarity to humans and their human-like behavior and actions, we tend to ascribe a personality to humanoid robots. In actual fact, simulating a personality can influence human-machine interaction. For an experiment, Japanese scientists from Toyohashi University of Technology developed a robot that follows the eyes of its human dialog partner and registers when he or she is distracted by other events. In this situation, the robot leans forward, raises its voice, and nods. The result: by demonstrating personality traits, the robot regains the attention of its human counterpart.

Artificial social intelligence

It is still difficult or even impossible to draw the line between "just" a smart robot and a social one. A current example is Jibo, the first social robot from the eponymous US company, which has been available since the end of 2017. According to the manufacturer, the approximately 30-centimeter tall domestic robot loves being amongst humans and building a relationship with them. It learns which people its owner especially likes and blends seamlessly into the owner's social life. Jibo is also charming and is able to produce surprises with spontaneous actions like a little dance. At least, this is what the manufacturer says. The field trial showed that the social robot does not differ significantly from other smart systems. But it is much more expensive.

Protection for humans

When robots are used in industrial production, workplace safety measures ensure that humans are protected. These measures include adequate safety distances between humans and machines, safety barriers, photoelectric barriers, and scanners in monitored zones. The safety precautions also include emergency switches on the robot and its ability to recognize collisions with objects and humans and to respond appropriately. This applies especially to cobots.

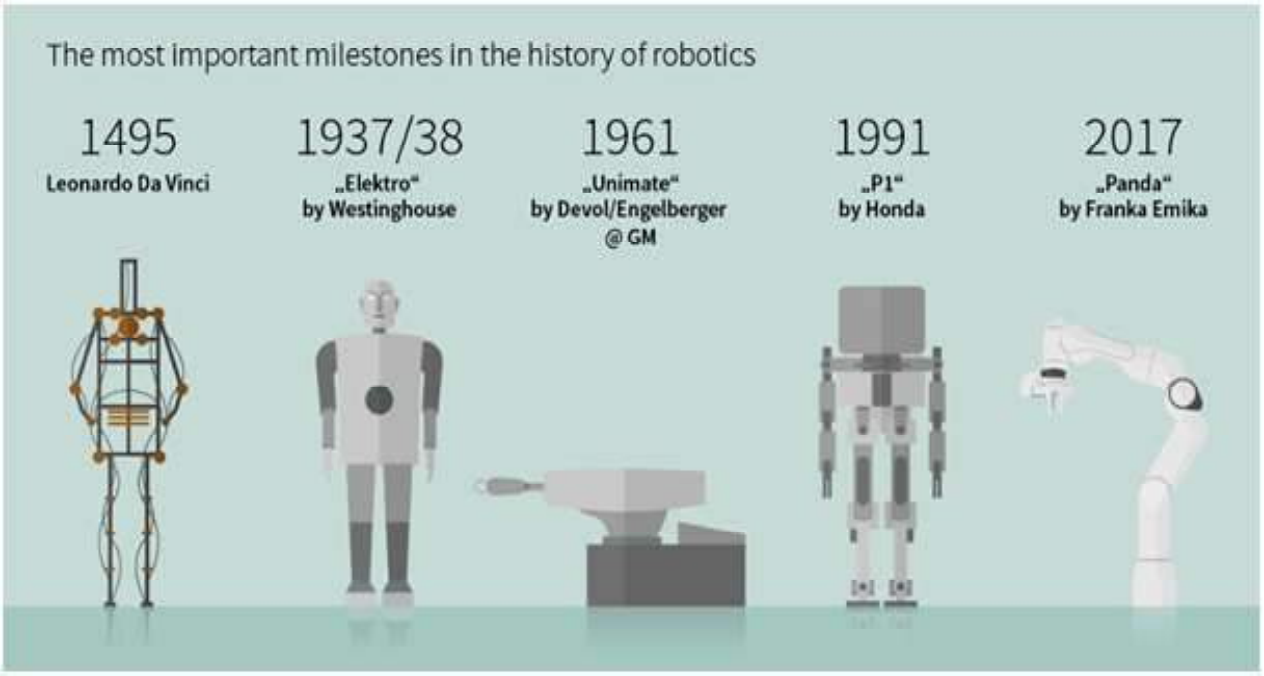
With these newer industrial robots, there are no separating safety devices in certain working areas. Other technical safety measures are used instead. For example, if a person is several meters away, the robot operates in normal mode. If the person gets closer, from a defined threshold, the robot slows down. If the person is very close and there is just a one-meter gap, it stops.

With newer systems, ToF (Time of Flight) technology is used. This technology uses 3D camera systems that measures distance based on time of flight. The surroundings are illuminated with a modulated light source. For each pixel, the camera measures the time that the light needs to reach an object

and be reflected, which is then used to calculate the distance of each pixel to the object in question. Radar sensors are also used in this area. In this case, movements are detected on the basis of electromagnetic waves in the radio frequency range. Safety for humans can also be increased by combining several redundant technologies.

Data protection

In a workplace where an increasing number of complex systems are connected and communicate with each other, it is important that these systems are protected against data theft and manipulation. In addition to manipulating configuration files (changing the motion areas or the position data) and code manipulation (reprogramming sequences), manipulating the robot feedback (deactivating alarms) is the greatest threat. These interventions can lead to the destruction of products, damage to robots and, in the worst-case scenario, injuries to people working in these areas. To guarantee the security of data, interfaces, and communication channels, a growing number of companies choose external software solutions. These solutions offer protection against manipulation of configuration files by encrypting them and storing them in a Secure Element (SE). Authentication also prevents unauthorized access to the central processing unit. To prevent code manipulation, software solutions offer authorization of sent commands by means of a hash process and verification of the code.



The Elon Musk of ancient times

Even in the 1st century BC, there were inventions, machines, and works that could be seen as the predecessors of robots and robotics as we know them today. They come from Hero of Alexandria, also known as Heron of Alexandria, a Greek mathematician and engineer. That also explains his “nickname” Mechanicus. In his work “Automata” (the book of machines), Hero describes various “robots”. Some of them could automatically open temple doors or play music. You could almost say, the first ancient smart home. Apart from his drafts for catapult-like weapons, Mechanicus is especially remembered for his aeolipile, also known as Hero’s engine. This is the first heat engine, a predecessor of the steam engine. The forefather of robotics designed more than 100 drafts for robots and machines.

Leonardo and the gallant knight

In 1495, the multiple genius and polymath Leonardo da Vinci designed what was probably the first human-like machine. His Mechanical Knight was able to sit and stand other functions: lifting the visor and full movement of the arms. The movements were carried out with a complex system of pulleys and cables.

Whether da Vinci actually built the robot or only designed it cannot be proven historically. In any case, robotic knights that were built according to the plans were fully functioning.

The revolt of the robots

The word robot was first used in the English language in the 1920 science fiction play R.U.R. by Czech author Karel Èapek. It was first performed on January 25, 1921. In the internationally successful play, autonomously thinking machines are the spitting image of humans. When they develop a consciousness, the robots rebel against their role as slaves which leads to the extinction of the human race. A touch of Terminator on the stage.

Elektro

Elektro made his appearance at the 1939 New York World Fair. The more than two-meter tall and 120 kilogram heavy humanoid robot was able to speak about 700 words thanks to an integrated record player. As well as having movable arms and legs, the mechanical man was also able to distinguish between different colored lights and to smoke cigars. The year after the world fair, Elektro appeared together with the robot dog Sparko.

Industrial robot revolution

George Devol was granted the first patent for an industrial robot in 1961. That same year, the Unimate was deployed on an assembly line of General Motors. It consisted of a computer-like box that was connected to another box and an arm. The robot removed heavy die-cast components from an assembly line and welded them on to automobile bodies. At that time, this section of the production was associated with high health risks for human employees. In addition to the danger from chemical substances, there were also several accidents where employees lost limbs. In Germany, the age of industrial robots began in the 1970s.

Award-winning versatility

In November 2017, the Munich-based start up Franka Emika received the 2017 German Future Prize from the German President for its development of inexpensive, flexible, intuitively operated robots. The lightweight robots can be used in industrial applications and in healthcare. This is possible due to the torque sensors installed in the joints that respond to human touch. Another special feature of this robot is the price, which is well below the market average and, consequently, makes highly efficient, ultramodern robots appealing and affordable even for small and medium-sized companies.

Electric motors

Many modern robots currently use electric motors. While humanoid robots and smaller robots are powered mainly by DC motors, most industrial robots and CNC machines operate with 3-phase motors. These motors are preferred in automatic systems where robots frequently make the same movement, such as a rotating arm.

Hydraulic drive

Modern hydraulic drives in robots work like artificial muscles. Since 2014, Japanese developers have been working on an artificial muscle consisting of a rubber hose, tension-proof fibers, and a protective collar. This system, which imitates a human muscle, does not use compressed air but is moved hydraulically. The advantages of this concept: The hydraulic muscle is more efficient and can also carry out fine movements. The system is also more sturdy than an electric motor. Robots equipped with a hydraulic drive system can withstand unfavorable conditions in disaster zones.

Direct control

With this type of control, humans are in complete control. They control the robot either directly by touch, by remote control, or via an algorithm that is programmed for the control unit.

Supervision

Humans specify basic positions and movement sequences. The robot then determines how to use its motors optimally within the scope of the specifications.

Semi-autonomous robots

With these systems, humans specify a general task. The robot autonomously determines the optimum positions and movement sequences to fulfill the task.

Autonomous robots

The robot recognizes its tasks autonomously and carries them out completely on its own.

Mechanical gripper

This commonly used type of gripper is used especially on industrial robots and, in most cases, has a pneumatic or hydraulic drive system. Smaller robots with the corresponding smaller grippers have a pneumatic drive that allows precise movements at a reasonable cost. Hydraulic drive systems are used for heavy loads.

Magnetic gripper

With magnet grippers, a distinction is made between permanent and electromagnetic grippers. With the simpler permanent magnet grippers, the gripping power is provided by a permanent magnet. The gripped material is released with the help of a piston that is installed inside the permanent magnet gripper. Electromagnetic grippers are supplied with direct current that provides the necessary magnetic field. The material is picked up and released by switching the electric energy on an off.

Adhesion gripper

Adhesion grippers are used to pick up small objects, such as cans and boxes. Adhesive forces are the attracting forces at the contact surfaces of two different or same substances through molecular forces. The substances can be in a solid or liquid state. The robot gripper moves the objects, using the adhesive force of liquids or by using special adhesives.

Vacuum gripper

Vacuum grippers can lift heavy loads. The object is pressed against the sealing lips of the sucker on the gripper, using the excess pressure of the ambient air. Heavy objects, such as workpieces or vehicle windows, are held in place by the vacuum in the sucker. These objects must have a smooth surface so that they can be sucked up by the sucker.

Humanoid hands

Humanoid hands allow much finer actions to be carried out than conventional grippers. An example of this is the Kanguera project at São Paulo University. This robot hand is the shape and size of a human hand. The signals are sent via cables and a transformer, which allows more precision compared to previous robot hands.

Force/torque sensor

Force/torque sensors are among the most commonly used sensor types. They are implemented in grippers and can record both force and torque. Strain gauge strips recognize deformations in the micrometer range. These deformations are converted into three force and torque components via a calibration matrix. Force/torque sensors have a digital signal processor that captures and filters the sensor data in case of deformation, calculates the measured data and sends this via the communication interface.

Inductive sensors

Inductive sensors are also described as proximity sensors. Without touching them, they recognize metal parts that are within their measurement range. Because of this, they are very suitable for wear-free recording of end positions of moving machine components, for example. The surface of the sensor radiates an oscillating electromagnetic field. If metal objects are in the measurement range, they absorb a small amount of energy from the oscillator. If the energy transfer reaches a threshold, the target object recognition is confirmed and the sensor output changes its state.

Capacitive sensors

Capacitive sensors consist of two metal parts isolated from each other and can recognize both metallic and non-metallic materials. Measurement is touchless through the change in capacity of an electric capacitor. Since the capacity of a capacitor changes with the distance of its electrodes, this measurable variable is used to measure distance. Capacitive sensors are used, for example, to reliably recognize humans in the vicinity of the robot.

Magnetic sensors

Magnetic sensors are used for touchless, exact position detection and recognize magnets even through stainless steel, plastic, and wooden structures. The sensors are based on the GMR effect (giant magneto resistance). This effect occurs in structures that consist of alternating magnetic and non-magnetic thin layers that are just a few nanometers thick. With this effect, the electric resistance of the structure depends on the mutual orientation of the magnetization of the magnetic

layers. Magnetization in the opposite directions is much higher than in the same direction.

Tactile sensors

Tactile sensors perceive the mechanical touching of objects and derive signals that are then sent. For example, a gripper arm can determine the shape and position of an object with the aid of tactile sensors. Even if a sensor cannot yet match human senses, innovative tactile sensors can imitate the mechanical properties and tactile receptors of human fingertips. This allows the robot to autonomously adjust the gripping intensity according to the condition of the object, an important property, especially in human-machine interaction.

Optical sensors

In robotics, optical or visual sensors have the tasks of acquiring information from an image or an image sequence, analyzing this, and acting or reacting on the basis of this analysis. For example, the data is recorded by one or more cameras (2D or 3D) or by a scanner. Optical sensors play an important part in the navigation of robots and their orientation in the surroundings.

Rolling robots

The most common method or movement is on four wheels. But there are also robots with one or two wheels to increase mobility and save components. All-terrain robots have six or more wheels.

Rail-mounted robots

Feeding robots in the agricultural industry are one example of this type of movement. The feed container, mixing device and weighing device are suspended on a rail or are guided laterally. Power is supplied by batteries, a trailing cable, or a supply rail. The robots are controlled by a process computer installed on the container. The feeding robot gets new feed from stationary storage or mixing containers.

Walking robots

Robots that walk upright on two legs are still a great challenge for developers, especially as regards stability. The ZMP (Zero Moment Point) algorithm is a solution from Honda that is used by the ASIMO robot to move on two legs. However, this model needs a flat surface to move. Consequently, this robot is not suitable for trips in rough terrain. A more advanced method is the use of a dynamic compensation algorithm. It is more robust than ZMP technology, as the robot's movement is constantly monitored and the feet are placed to ensure stability. Robots that use this technology can even jump. Another approach is passive dynamics in which the momentum of the swinging limb is used for more efficiency. With this technology, robots can even walk uphill and are said to move ten times more efficiently than robots with ZMP technology. Currently the most impressive example as regards movement and balance comes from Boston Dynamics: The latest version of the walking robot Atlas is able to perform incredible jumps and backflips.

Flying robots

If we think about flying robots, the first thing that comes to mind is the drone, which is now used extensively in civil and military areas. But there are other interesting concepts, such as the EU project ARCAS (Aerial Robotics Cooperative Assembly System). Scientists at the German Aerospace Center have integrated a robotic gripper arm in an autonomous helicopter. This robot is used to inspect and repair pipelines. Other conceivable areas of use are maintenance of satellites or industrial plants or building infrastructures on other planets. In 2013, researchers at Harvard University developed robot bees that can fly and dive into water. Perspectively, these tiny robots will take over the tasks of bees that are threatened with extinction and pollinate plants.

Navigation of autonomous robots

Mobile robots are equipped with a combination of navigation hardware and software to perceive their surroundings, navigate optimally and respond to dynamic events, such as people or moving objects. In most cases, a mixture of GPS navigation device, radar sensors, but also Lidar technology or cameras ensures that the robots can navigate and act safely in the environment.

Conclusion and Applications :

Smart digital assistants in the ISS to reduce stress for humans in future Mars missions. Avatar robots, including VR suit, with which everyone can visit any place in the world without being physically present. A four meter high, three ton heavy racer that

redefines racing. There's no doubt: Considering the rapid developments of the past years, robotics will have a lasting influence and will shape the future for humans and their cooperation and coexistence with increasingly intelligent, autonomous machines. The associated questions have more to do with ethics than technology.

But should humans do everything that is technically feasible? How intelligent should machines become? Should robots be made so intelligent that some time in the future they see humans as an obstacle to their continued progress? How should driverless vehicles react when a collision is unavoidable: Should it steer into a group of older people rather than a group of schoolchildren? Should it be possible for us to transfer our personality onto a machine hard drive so that we can continue to exist even when the shell of flesh and blood no longer allows this? At present, these considerations are still a long way off. We'll return to the here and now and give an overview of projects from various areas of our lives which show how robots are currently used.

Cafe X

No seats, no tables, not even bar tables. Cafe X, which opened in San Francisco in 2018, is designed completely for efficiency and ultrafast service. Two coffee machines and a robotic arm provide the caffeine hit of the future. Customers choose their hot beverage plus any extras on a touch screen, enter their cell phone number, and pay by credit card. About 30 seconds later, a code is sent to their smartphone. They enter this code at the dispensing station and their coffee is poured. The complete process takes no longer than a minute. One employee in the café is sufficient to monitor the robot and replenish coffee beans, milk, etc.

Zume Pizza

Zume Pizza is located in the San Francisco Bay Area. The centerpiece of the company is the aptly named Doughbot that presses the dough into shape up to five times faster than a human being. Robots also dispense the perfect amount of sauce, spread the sauce, and remove the pizzas from the oven. Each morning, the number and types of pizzas required for that day are calculated. This means that each pizza doesn't have to be prepared from scratch, but is still fresh compared to classic fast food. All orders are placed by smartphone or on the company's website. The company has no shops where pizzas can be picked up. All pizzas are delivered.

The Elevon project

The high level of physical stress for nurses and carers when lifting or moving patients is often the cause of health problems. With its Elevon project, the Fraunhofer Institute for Manufacturing Engineering and Automation wants to provide some relief for people working in the healthcare industry. Elevon is a semi-autonomous lifter to lift and transport persons. The multi-functional patient lifter is designed for use in stationary care and will autonomously move the patient to the intended location. Elevon can carry out various transfer processes and transport patients while they are lying and sitting. Staff can request the lifter electronically, which saves time and unnecessary legwork.

Volocopter 2X

The world's first multicopter that is approved for manned flights comes from Germany. The Volocopter 2X vertical takeoff and landing aircraft has 18 rotors, flies completely autonomously and has room for two persons. Passengers also have the option of steering the multicopter with a joystick. It can be used as a flying taxi or a trade fair shuttle. Using its own hubs, the Volocopter, which is powered by electric motors, connects vital intersections like airports or business parks with city centers.

Starship

Logistics service provider Hermes is currently trialling package deliveries in German cities with the Starship robot. The company plans to use logistics robots in five to ten cities in 2018. Starship is developed, built, and maintained by the eponymous startup, which is based in Estonia and London, UK. The robot will deliver packages from Hermes branches to customers within a radius of up to four kilometers. The machines are controlled via satellite positioning. Once the systems have learned the street maps, they will be able to navigate completely autonomously.

Mercedes Future Bus

The Future Bus from Mercedes first made its appearance in Amsterdam, Netherlands, in 2016. In trial mode, the bus traveled a 20 kilometer section from Schiphol airport to the city of Haarlem with no problems. The bus drives autonomously

(initially with a driver for monitoring purposes) on a separate bus lane (Bus Rapid Transit, BRT) and brakes automatically when it recognizes obstacles. The system communicates with traffic lights and stops accurately at bus stops. The city buses can share information with each other, such as details about the weather, the number of passengers on board, and road conditions. The Future Bus will go into serial production from the start of 2020.

SAM3

In January 2017, Netherlands-based Robot Security Systems launched its SAM3 security robot on the market. The robot is designed for building security and can recognize people and objects while on the move, can avoid obstacles, and can even operate elevators and doors. If a person cannot identify themselves via the integrated ID reader within a time limit or tries to sabotage the robot, SAM triggers an alarm. The robot scans the area it is programmed to patrol and is able to detect fire or faults in technical systems. The machine has a thermal imaging camera and four cameras so that is has 360 degrees vision. It has a top speed of 10 kilometers per hour.

Advance Liberty A 50

In 2017, Danish company Nilfisk introduced a scrubber-vacuum cleaner for autonomous wet cleaning of floors. The Advance Liberty A 50 floor-care robot has sensors, cameras, and software, with which it can record a room with a single manual ride. The robot recognizes obstacles as small as a tennis ball and avoids these on its own. It can even be used in supermarkets during opening hours.

Zenbo

According to the producer, Asus, the domestic robot Zenbo assists people at home as a helper, entertainer, and companion. When it is integrated into a smart home system, Zenbo can check who is ringing the doorbell. When the camera image from the front door has been sent to the robot, the house owner can unlock the door by remote control. The emergency call function is intended for use in homes where older people live. If the robot registers that someone has fallen down, it alerts other family members. Zenbo can also remind people in the house to take their medication or that they have an appointment with their physician.

Nanorobots

Researchers at Arizona State University in the US have developed nanorobots that can search for tumors in the body on their own and then cut off the blood flow to them. Tumors and metastases have been successfully fought with this technology in experiments on mice. If a nanobot encounters a tumor blood vessel in the bloodstream, it triggers a blood clot in it. As a result, the tumor shrivels and dies. The scientists report that the nanobots work quickly and lay siege to the cancer cells just a few hours after being injected. To date, there have been no side effects.

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How does colour appear on the substrate ?

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Nature is beautiful as it is colourful, said John Keates. We shall try to make a cursory look into how the colours appears in the most of the things around us. As we understand Colour appears on any substrate, if, a part of the frequency of wavelengths in the visible range of electromagnetic radiation (falling between 400 – 700 nm) is absorbed by the substrate and rest are transmitted then we experience the complimentary colours; called as subtraction theory, for simple reasoning that some part is subtracted and you get the result.

For example, if, blue frequency is absorbed from the VIBGYOR and rest are transmitted without blue, i.e., **VIGYOR**, we shall experience yellow. So logically it follows that if we supplement the blue deficiency in yellow, by externally addition of blue dye, then it becomes **VIGYOR + B = VIBGYOR**. This is why little blue is added, to remove the yellowing of the white shirts or white dress materials.

Beautiful Mandarin Duck

Now, three things are important in colour appreciation a) **the illuminant**, b) **colour bearing molecules** and c) **the perceiver**. For discussion, we are assuming the most important illuminant of Nature; the visible part of solar radiation only. You might also experience that the emission spectra of solar radiation are not constant. It changes, say, in dawn or dusk, in mid noon, in northern hemisphere and southern hemisphere etc. We have to take all these into account mathematically by using formulae of Blackbody radiation, while matching the colour at the final end and place of use by the consumers, which we do quite creditably indeed!

Now, the brilliant colours that we see in nature, say in flowers or fruits, are due to bright organic pigments that is produced in the respective bio-synthetic pathways (for example, Beta Carotene in carrot, which has elegant extended conjugated chains only we can easily apply particle-in-box theory of quantum mechanics to calculate and predict the exact colour of the colourant, anthracene or proanthecedines in vegetable tannins, which contains elaborate fused aromatic rings, along with some oxochromic groups covalently joined and quinonoid group of organic pigments with elaborated fused rings are synthesized biochemically). There could be also brilliant metal complexes as present in chlorophyll in leaves or heme in blood. These are same four porphyrin rings of phthalocyanine groups, only difference lays in the central metal; for chlorophyll it is Mg^{2+}, while for Heme Fe^{2+} where the former is brilliant green, while the latter is brilliant red. These are so to say, 1:4 metal complex pigments; we also use synthetic 1:1 and 1:2 metal complex dyes in leather making.

Coming to the central point that, why a part of visible portion of light absorbed by the coloured substrates? There are several reasons as follows: -

a) Due to **selective absorption** by colourants (dyes or pigments). The incident electromagnetic radiation falling on these molecules causes perturbation of valence shell electrons and they undergo a quantum jump from ground state to excited state by absorbing quantum energies from the incident electromagnetic radiation within 10^{-8}s., exactly matching the energy difference between the ground state and excited state. Say for example, why a substrate appears yellow? Because the dye/pigment molecules that we have treated on its surface, have been so made that, the energy difference between the ground state and

excited state of the valence bond matches exactly with the blue frequency of the incident light; so, it absorbs selectively the blue frequency. This is not magical; Schrodinger's equation gives a precious datum about the energy differences between any states of any molecule.

b) The other mechanism may be due to **scattering** by particles, either embedded or floated in the solid, liquid or air media. Blue colour of sky in noon or crimson hue during dusk or blue colour of oceanic water is due to this. In fact, for a finishing film on leather surface, the colour is because of the dual action of selective absorption and scattering (Kubelka-Munk equation).

c) It could be due to **dispersion** of light, Prisms, Rainbow, which I have already explained in details; when visible light components of different frequencies deviate from their paths at different angles, we see the colours of the emission spectra. Rainbow is perfectly circular but, because of spherical earth the lower part of the rainbow is not seen and thus it appears as a big arc.

d) A part of the visible electromagnetic radiation can be lost due to **diffraction** of light for example in diffraction grating. Look into any holograms either on the debit card or credit cards. There are plenty of parallel linear grooves in it, whose cross section is like triangles of equal size and shape. How much? Say, a good diffraction grating in UV-Vis Spectrophotometer can have as high as 10,000-20,000 such lines per mm! The colour in the hologram would depend on the angle of observation and the grazing angle with which the component of light is diffracted.

e) It could also be due to **interference**. What happens when you walk along a water logged street where there was a spillover of some petrol may be, because of the carrier of petrol just past few minutes ago. You will see different colours on the spreading petrol layer over the stagnant water. Because the light from air suffers two refractions successively, one from air to thinner (as compared to water in the bottom, but denser as compared to air) the petrol medium and latter from lighter (petrol) to denser water medium. While touching the surface of the road, which is opaque in nature; the light has to move back towards the source again suffering from two successive refractions but this time in reverse order. Now while finally exiting, if, it encounters interference from some of the reflected light as well, then the wavelengths that overlaps with complete face differences will get nullified; while those in phase will get amplitude enhancement. Surely it will depend on the angle of observation or the angle of incidence.

Now, finally coming to the brilliant question of why is the duck's, pigeon's or peacock's feather so colourful. You might also notice that the colour also changes with the angle of view or when the birds bend or feathers sway in a gentle breeze. Now the feather is not a flat smooth surface there are vertically upward enormous nap fibres made of β-collagen in it, running amazingly almost parallel to each other's. When incident light enters in an angle through the gaps of the two nap fibres, it suffers cumulative reflections bouncing off one nap surface to the next and from there bouncing back to the former, which happens repeatedly, angularly but progressively downward. From the end of the fibre again back towards the source following the same grand design in the return path. Finally, in this process there is a high possibility of **super-positioning** of the light waves meeting each other in opposite directions, as stated in the previous paragraph. Thus if, those frequencies of lights which gets nullified because of opposite phases, fall in some of the visible bunch of electromagnetic radiation (between 400 and 700 nm) the complementary colour would be seen. If there happen to be pores or condensed moisture droplet in the fibre surface, (which quite often happens) then there can be a total internal reflection of light, causing mirror-like shine/gloss in the colour.

All these phenomena happen because our hero of the drama - the light acts funnily, sometimes as particle, at other times as waves; so, we see a variety of interaction mechanisms. **Quantum Electrodynamics (QED)**, for which Richard Phillip Feynman was awarded Nobel Award in Physics described the strange & exciting theory of light and matter from Quantum mechanical angle.

Please mind it, in this discussion, we have taken into consideration that the incident light is constant and the observer is also constant without defects in L, M or S cones in retina of eyes (without colour blindness).

It must be mentioned that the colours in Natural products are mostly organic or organometallic which are synthesized in vivo biochemically. On the contrary, mechanism of selective absorption of wavelength band in the visible range remaining same; **inorganic pigment** produce colours by **d – d forbidden transition**, **charge transfer** (internal redox) or **ion trapped in solid matrix** (colour of the gems).

ENDORSING THE LEATHER INDUSTRY'S LEATHER MANIFESTO FOR COP26

Global leather industry sign Leather Manifesto ahead of the UN's climate change summit

In the run up to the UN Climate Change Conference (COP26) in Glasgow, international leather industry leaders have signed the Leather Manifesto, calling on decisionnmakers to prioritise natural fibres suc as leather, cotton and wool over synthetic, fossil fuels-based materials, as well as recognise their potential for helping to reduce the environmental impacts of consumer products.

Spearheaded by the Leather & Hide Council of America (LHCA), the Manifesto has been signed by over 32 leather-focused organisations across the world, representing significant industry alignment to ensure that leather is not overlooked as a material in the global conversation on climate action — particularly with a focus on leather's durability and biodegradability.

The Manifesto specifically calls for COP26 to:

a) Recognise the cyclical, climate efficient nature of natural fibres and their potential for a positive contribution to reducing the climate impacts of consumer products.
b) Encourage the use of natural fibres wherever feasible and reduce unnecessary reliance on fossil-fuel-based materials.
c) Support LCA methodologies that accurately account for the environmental impact of fossil-fuel based materials, including end of life properties.
d) Promote 'slow fashion', durable products, and items that can be used many times, repaired, and refurbished, and last for years.

THE FULL LEATHER MANIFESTO

Our Materials Impact our Climate

The world needs materials that are sustainable, renewable, recyclable, biodegradable, and most importantly, do not add to the burden of atmospheric carbon.

Natural fibres, such as leather, cotton, wool, mohair, alpaca, silk, hemp and mycelium, are part of the biogenic carbon cycle and as such are comprised of carbon that has been in the atmosphere for a millennia.

These readily available raw materials, when ethically and properly produced, are an important replacement for fossil fuels, reducing the need for its extraction and retaining more carbon in the earth.

Furthermore, at the end of life, properly produced natural materials will biodegrade, limiting their impact and mitigating harmful emissions, such as microplastic pollution, often associated with the synthetic materials that they replace.

With particular reference to leather, the leather manufacturing sector upcycles an unavoidable waste from the food industry, to produce a versatile, durable, unique material, ideal for the circular economy that the world must move towards.

However, these same materials are often dismissed through a lack of understanding of the manufacturing process and its supply chain, or through the application of questionable science generally in the form of incomplete and incomparable or out-dated Life Cycle Assessments (LCAs), and the marketing of new, often fossil fuel-based materials claiming unsubstantiated levels of sustainability.

As shown by some emerging climate science studies, such as the GWP* model, production and use of biogenic materials typically does not add to the warming burden of the atmosphere, and where it does, the effects are short-lived. This is in contrast to materials produced from fossil-fuels, which release carbon that has been locked in the earth's core for a millennia, and will persist in the environment, contributing to climate change.

Therefore, we, the undersigned organizations, call on the COP26 forum to…

a. …Recognize the cyclical, climate efficient nature of natural fibers and their potential for a positive contribution to reducing the climate impacts of consumer products.

b. …Encourage the use of natural fibers wherever feasible and reduce unnecessary reliance on fossil-fuel-based materials.

c. …Support LCA methodologies that accurately account for the environmental impact of fossil-fuel based materials, including end of life properties.

d. …Promote 'slow fashion', durable products, and items that can be used many times, repaired and refurbished, and last for years.

Signatories to the Leather Manifesto

- ✓ International Union of Leather Technologists and Chemists Societies (IULTCS)
- ✓ Asociación Española del Curtido (ACEXPIEL – Spanish Tanners' Association)
- ✓ Associação Portuguesa dos Industriais de Curtumes (APIC – Portugal Tanners' Association)
- ✓ Association of Dutch Hide Traders (V.N.H.)
- ✓ Australian Hide Skin and Leather Exporters' Association Inc. (AHSLEA)
- ✓ Cámara de la Industria de Curtiduría del Estado de Guanajuato - México (CICUR)
- ✓ Cámara Nacional de la Industria de Curtiduría - México (CANALCUR)
- ✓ Centre for the Brazilian Tanning Industry (CICB)
- ✓ Centro Tecnológico das Indústrias do Couro (CTIC - Leather Center in Portugal)
- ✓ China Leather Industry Association
- ✓ Confederation of National Associations of Tanners and Dressers of the European Community (COTANCE)
- ✓ Dutch Association of Leather Chemists & Technicians (NVLST)
- ✓ International Council of Hides, Skins and Leather Traders Association (ICHSLTA)
- ✓ International Council of Tanners (ICT)
- ✓ Fachverband der Textil-, Bekleidungs-, Schuh- und Lederindustrie – Berufsgruppe
- ✓ Ledererzeugende Industrie (Austrian Association of Textile, Clothing, Shoe and Leather Industry – Leather Producing Industry Group)
- ✓ Fédération Française des Cuirs et Peaux (French Hides & Skins Association)
- ✓ Fédération Française Tannerie Megisserie (French Tanners Association)
- ✓ Leather and Hide Council of America
- ✓ Leather Cluster Barcelona
- ✓ Leather Naturally
- ✓ Leather UK
- ✓ Leather Working Group
- ✓ One 4 Leather
- ✓ Society of Leather Technologists and Chemists
- ✓ Sustainable Leather Foundation
- ✓ Swedish Tanners Association
- ✓ Turkish Leather Industrialists Association (TLIA)
- ✓ UNIC Concerie Italiane (Italian Tanneries Association)
- ✓ Verband der Deutschen Lederindustrie e.V. (TUV – German Leather Federation)
- ✓ Wirtschaftsverband Häute/Leder (WHL – German Hide and Leather Association)
- ✓ Zimbabwe Leather Development Council

(leatherworkinggroup.com - 11/11/2021)

ECCO MAKES "FIRST SOLID STEP" TO WATER-FREE LEATHER MANUFACTURING

With brands under increasing pressure to boost their sustainability credentials, more and more of them are announcing initiatives in a number of areas with manufacturing and materials being a key one.

With this in mind, one of Scandinavia's best-known shoes and leather goods companies, Ecco Leather, has just unveiled what it calls game-changing technology after five years of research.

DriTan tech is being premiered through a special commemorative edition of its classic Soft 8 sneaker at the World Water Congress 2018 in Tokyo. The company said it's the "first solid step towards water-free leather manufacturing" and that's a message that's likely to appeal increasingly to the all-important millennial demographic.

It's important because Ecco said the Leather Working Group estimates that total water consumption worldwide in bovine leather-making is 400 billion litres a year.

Tanning as a process date back 10,000 years and the process was always thought to be impossible without the use of such large amounts of water. But the new technology "breaks the paradigm and is now set to revolutionise the entire leather industry," Ecco claims.

It uses the moisture already present in the hides and the result is said to be "indistinguishable from traditionally tanned leather in terms of quality, characteristics, stability and lead-time."

Besides saving huge amounts of water, the technology also "considerably minimises the discharge of waste water and the use of chemicals."

The company said that at its tannery in the Netherlands alone, it will eliminate 600 tons of sludge a year, translating into 40 truckloads of sludge deposited in landfills annually. And it clearly seems to think that it's an option not only for large-scale operations such as those that it has, but for smaller companies as well.

"This process only involves what you already have at hand," said Thomas Gøgsig, Head of Applied Research at the firm. "You don't have to invest in new equipment. You don't have to look for new exotic chemicals. You just use what is already available at the tannery, only in a different way."

(in.fashionnetwork.com: 14/10/2021)

ANALYSIS – EXPORT PERFORMANCE OF LEATHER AND LEATHER PRODUCTS INCLUDING NON-LEATHER FOOTWEAR DURING APRIL-AUGUST 2021 VIS-À-VIS APRIL-AUGUST 2020.

As per officially notified DGCI&S monthly export data, the export of Leather and Leather products including Non-Leather Footwear for the period **April-August 2021 touched US $ 1831.35 Mn** as against the performance of **US $ 1159.62 Mn in April-August 2020**, recording growth of **57.93%**. In rupee terms, the export touched **Rs. 135780fv .67 Mn in April-August 2021** as against **Rs.87502.33 Mn in April-August 2020**, registering a growth of **55.17%**.

Export of Leather and Leather Products including Non-Leather Footwear from India during April - August 2021 Vis-a-Vis April - August 2020

(Value in Million Rs)

CATEGORY	APR-AUG 2020	APR-AUG 2021	% VARIATION	% Share 2020	% Share 2021
FINISHED LEATHER	8996.01	14124.70	57.01%	10.28%	10.40%
LEATHER FOOTWEAR	37897.49	56643.05	49.46%	43.31%	41.72%
FOOTWEAR COMPONENTS	5412.90	7356.13	35.90%	6.19%	5.42%
LEATHER GARMENTS	7311.85	10235.41	39.98%	8.36%	7.54%
LEATHER GOODS	20236.94	34499.18	70.48%	23.13%	25.41%
SADDLERY AND HARNESS	3876.30	7852.87	102.59%	4.43%	5.78%
NON-LEATHER FOOTWEAR	3770.83	5069.33	34.44%	4.31%	3.73%
TOTAL	**87502.33**	**135780.67**	**55.17%**	**100%**	**100.00%**

(Value in Million USD)

CATEGORY	APR-AUG 2020	APR-AUG 2021	% VARIATION	% Share 2020	% Share 2021
FINISHED LEATHER	119.22	190.55	59.83%	10.28%	10.40%
LEATHER FOOTWEAR	502.23	764.03	52.13%	43.31%	41.72%
FOOTWEAR COMPONENTS	71.73	99.23	38.34%	6.19%	5.42%
LEATHER GARMENTS	96.90	138.06	42.48%	8.36%	7.54%
LEATHER GOODS	268.19	465.22	73.47%	23.13%	25.40%
SADDLERY AND HARNESS	51.37	105.92	106.19%	4.43%	5.78%
NON-LEATHER FOOTWEAR	49.97	68.34	36.76%	4.31%	3.73%
TOTAL	**1159.62**	**1831.35**	**57.93%**	**100%**	**100.00%**

Source : DGCI &S

Footwear (Leather Footwear, Footwear Components & Non-Leather Footwear) holds the major share of 50.87% in the total export of leather and leather products including Non -Leather Footwear with an export value of US $ 931.60 Mn. This is followed by Leather Goods & Accessories with a share of 25.40-, Finished Leather 10.40%, Leather Garments 7.54% and Saddlery & Harness 5.78%.

Month wise Export of Leather & Leather Products including Non-Leather Footwear from India during April to August 2021

(Export Value in Million US $)

COMMODITY	APRIL 2021	MAY 2021	JUNE 2021	JULY 2021	AUG. 2021	TOTAL APRIL-AUG. 2021
FINISHED LEATHER	40.15	40.38	37.26	38.20	34.56	**190.55**
LEATHER FOOTWEAR	131.87	115.82	155.86	175.60	184.87	**764.03**
FOOTWEAR COMPONENTS	16.70	17.66	19.53	23.06	22.28	**99.23**
LEATHER GARMENTS	14.18	18.85	29.51	39.36	36.18	**138.06**
LEATHER GOODS	86.67	76.14	82.89	111.49	108.01	**465.22**
SADDLERY AND HARNESS	18.02	17.24	21.35	24.96	24.34	**105.92**
NON LEATHER FOOTWEAR	15.80	9.50	12.47	16.30	14.27	**68.34**
TOTAL	**323.39**	**295.60**	**358.9**	**428.97**	**424.51**	**1831.35**

Source : DGCI &S

ANALYSIS:- COUNTRY WISE EXPORT PERFORMANCE OF LEATHER AND LEATHER PRODUCTS INCLUDING NON-LEATHER FOOTWEAR FROM INDIA DURING APRIL-AUGUST 2021 VIS-A-VIS APRIL - AUGUST 2020

(Value in Million US $)

COUNTRY	TOTAL		% Change 2021	Share in total export APR-AUG 2020	Share in total export APR-AUG 2021
	APR-AUG 2020	APR-AUG 2021			
U.S.A.	185.95	395.65	112.77%	16.04%	21.60%
GERMANY	163.68	204.20	24.76%	14.11%	11.15%
U.K.	95.73	167.92	75.41%	8.26%	9.17%
ITALY	88.16	118.87	34.83%	7.60%	6.49%
FRANCE	76.99	106.01	37.69%	6.64%	5.79%
NETHERLANDS	47.46	80.84	70.33%	4.09%	4.41%
SPAIN	53.58	77.60	44.83%	4.62%	4.24%
CHINA	27.15	62.09	128.69%	2.34%	3.39%

(Value in Million US $)

COUNTRY	TOTAL		% Change 2021	Share in total export APR-AUG 2020	Share in total export APR-AUG 2021
	APR-AUG 2020	APR-AUG 2021			
BELGIUM	28.06	48.35	72.31%	2.42%	2.64%
U.A.E	21.79	40.75	87.01%	1.88%	2.23%
AUSTRALIA	17.63	35.62	102.04%	1.52%	1.95%
POLAND	29.26	31.75	8.51%	2.52%	1.73%
HONG KONG	22.71	31.15	37.16%	1.96%	1.70%
DENMARK	19.35	25.74	33.02%	1.67%	1.41%
VIETNAM	16.24	24.93	53.51%	1.40%	1.36%
PORTUGAL	15.05	22.91	52.23%	1.30%	1.25%
JAPAN	14.58	22.12	51.71%	1.26%	1.21%
CANADA	10.69	21.15	97.85%	0.92%	1.15%
RUSSIA	13.51	18.28	35.31%	1.17%	1.00%
CHILE	9.58	16.79	75.26%	0.83%	0.92%
AUSTRIA	11.22	15.78	40.64%	0.97%	0.86%
KOREA REP	12.84	14.99	16.74%	1.11%	0.82%
SOUTH AFRICA	8.33	14.28	71.43%	0.72%	0.78%
SWEDEN	8.77	12.33	40.59%	0.76%	0.67%
MALAYSIA	9.91	11.84	19.48%	0.85%	0.65%
MEXICO	5.71	11.66	104.20%	0.49%	0.64%
HUNGARY	9.83	10.40	5.80%	0.85%	0.57%
SAUDI ARABIA	6.49	10.09	55.47%	0.56%	0.55%
SOMALIA	11.48	9.61	-16.29%	0.99%	0.52%
SWITZERLAND	10.14	8.73	-13.91%	0.87%	0.48%
INDONESIA	6.31	8.48	34.39%	0.54%	0.46%
SLOVAK REP	5.41	7.35	35.86%	0.47%	0.40%
THAILAND	4.99	7.27	45.69%	0.43%	0.40%
NIGERIA	2.78	6.68	140.29%	0.24%	0.36%
ISRAEL	4.15	6.53	57.35%	0.36%	0.36%
TURKEY	4.45	6.18	38.88%	0.38%	0.34%
BANGLADESH	4.25	5.50	29.41%	0.37%	0.30%
FINLAND	4.15	5.47	31.81%	0.36%	0.30%
SINGAPORE	1.09	4.47	310.09%	0.09%	0.24%
CZECH REPUBLIC	2.38	3.84	61.34%	0.21%	0.21%
NEW ZEALAND	2.31	3.80	64.50%	0.20%	0.21%
SUDAN	3.03	3.02	-0.33%	0.26%	0.16%
KENYA	2.98	2.66	-10.74%	0.26%	0.15%
SRI LANKA DES	1.18	2.65	124.58%	0.10%	0.14%
TAIWAN	0.99	2.63	165.66%	0.09%	0.14%
NORWAY	2.63	2.48	-5.70%	0.23%	0.14%

(Value in Million US $)

COUNTRY	TOTAL		% Change 2021	Share in total export APR-AUG 2020	Share in total export APR-AUG 2021
	APR-AUG 2020	APR-AUG 2021			
OMAN	1.80	2.18	21.11%	0.16%	0.12%
GREECE	2.92	2.17	-25.68%	0.25%	0.12%
CAMBODIA	1.16	1.89	62.93%	0.10%	0.10%
DJIBOUTI	0.94	1.23	30.85%	0.08%	0.07%
OTHERS	47.85	72.44	51.39%	4.13%	3.96%
TOTAL	**1159.62**	**1831.35**	**57.93%**	**100.00%**	**100.00%**

Source : DGCI &S

ANALYSIS – INDIA'S IMPORT PERFORMANCE OF LEATHER AND LEATHER PRODUCTS INCLUDING NON-LEATHER FOOTWEAR DURING APRIL-AUG. 2021 VIS-À-VIS APRIL-AUGUST 2020

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-August 2021 touched US $ 420.60 Million as against the performance of US $ 264.20 Million in April- August 2020, recording a growth of 59.20%.

India's Import of Leather & Leather Products including Non-Leather Footwear during April – August 2021 VIS-À-VIS April – August 2020

(Value in Million US $)

CATEGORY	APR - AUG 2020	APR - AUG 2021	% VARIATION	% SHARE IN APR-AUG 20	% SHARE IN APR-AUG 21
RAW HIDES AND SKINS	5.95	11.97	101.18%	2.25%	2.85%
FINISHED LEATHER	112.76	141.67	25.64%	42.68%	33.68%
LEATHER FOOTWEAR	72.21	126.42	75.07%	27.33%	30.06%
FOOTWEAR COMPONENTS	6.60	9.62	45.76%	2.50%	2.29%
LEATHER GARMENTS	0.69	0.96	39.13%	0.26%	0.23%
LEATHER GOODS	8.42	16.54	96.44%	3.19%	3.93%
SADDLERY AND HARNESS	0.23	1.25	443.48%	0.09%	0.30%
NON-LEATHER FOOTWEAR	57.34	112.17	95.62%	21.70%	26.67%
TOTAL	**264.20**	**420.60**	**59.20%**	**100.00%**	**100.00%**

India's Import of different categories of Footwear holds a major share of about 59.02% in India's total leather & leather product including Non-Leather Footwear with an Import value of US $ 248.21 Mn. This is followed by Finished Leather with a share of 33.68%, Raw Hides & Skins 2.85%, Leather Goods & Accessories 3.93%, Saddlery & Harness 0.30% and Leather Garments 0.23%.

Month wise Import of Leather & Leather Products including Non-Leather Footwear from India during April to August 2021

(Value in Million US $)

PRODUCT	APRIL 2021	MAY 2021	JUNE 2021	JULY 2021	AUG 2021	TOTAL APRIL-AUG 2021
RAW HIDES AND SKINS	1.95	3.27	2.29	2.76	1.70	11.97
FINISHED LEATHER	27.47	31.44	30.80	22.26	29.69	141.67
LEATHER FOOTWEAR	20.62	21.14	35.75	27.58	21.33	126.42
FOOTWEAR COMPONENTS	1.78	2.18	1.65	2.11	1.91	9.62
LEATHER GARMENTS	0.04	0.02	0.26	0.18	0.46	0.96
LEATHER GOODS	3.68	1.76	2.90	3.64	4.55	16.54
SADDLERY & HARNESS	0.18	0.28	0.34	0.25	0.20	1.25
NON-LEATHER FOOTWEAR	18.47	24.34	32.83	22.25	14.28	112.17
TOTAL	**74.19**	**84.83**	**106.82**	**81.03**	**74.11**	**420.60**

Source : DGCI &S

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IMPROVEMENTS ON THE TECHNIQUES OF THE MANUFACTURING PROCESS OF PICKING BAND LEATHER

P. Bhattacharya & J. K. De

INTRODUCTION

Picking band is a strap of leather which is used in over-pick looms of textile and jute mills to transmit motion from picking arms of the looms to the picker.[1] One of its important criteria is high tensile strength, and the other is pliability. The leather should be very tough, not much stretchy and not too greasy.[2] Softness and toughness are necessary to allow the strap of leather to be tied to the mechanism of working shuttle and withstand the jerks in driving the shuttle repeatedly backwards and forwards along the loom. Heat developed due to the repeated jerking motion softens the grease contained in the leather which may come out and soil the textile by sprinkling over. This will happen if the grease is too soft and has a low melting point or the leather is too greasy.[3]

Although information is available on several processes for the manufacture of picking band leathers, the various intricacies leading to the production of the best quality of leather have not been fully elucidated. By the following methods of tannage picking band leathers can be manufactured:

(i) Full vegetable.[3]
(ii) Full chrome.[3]
(iii) Combination Sulphur-Chrome.[4]
(iv) Combination Sulphur-Oil-vegetable.[5]
and (v) Combination Alum-oil-vegetable.[6]

(i) Full vegetable :

(a) *Oak tannage*: In oak tanning the delimed butts are suspended in a series of weak oak bark liquors commencing from about 4° Bkr. The hides are transferred daily to a less used liquor of higher strength until they are well stuck through. This takes about 10 days. This is followed by a handler liquor of 12° to 16° Bkr. strength in which the butts are laid for 5 to 6 weeks with occasional hauling. A second handler is given with less frequent hauling followed by a short layer. A good oak bark tanning requires a period of at least 6 months. The leathers are then stuffed.[3]

(b) *Vegetable tannage*: A modern vegetable tannage comprises of usual suspender and handler liquors with a round of gambier liquors before treatment with a final layer of strong extracted liquor. After completion of vegetable tanning, stuffiing is done.

(ii) Full Chrome : Since there is a strong inclination in favour of chrome tanning for durability and strength of leathers, many tanners follow the chrome tanning process for the manufacture of picking bands. The butts are given a heavy pickle followed by chrome tanning in two

baths using 6—7% sodium bichromate and 3—3½% hydrochloric acid in the first bath. The chrome compound is reduced next day. 12—20% hypo and 6—10% hydrochloric acid are used for this purpose. After aging the leather for 24 hours to several days they are neutralised, fatliquored and stuffed. The stuffing is done in a preheated drum and the stuffing materials in molten condition are introduced.[3]

(iii) Combination Sulphur-Chrome : A Chrome-Sulphur tanning process has been worked out at C.L.R.I. (Madras). According to this process completely delimed butts are pickled and depickled. The depickling is done with 11% hypo which deposits sulphur inside the pelts. This is followed by a single bath chrome tanning with a basic chrome-sulphate solution equivalent to 2.5% Cr_2O_3 on the weight of the pelt. After complete tanning the leather is neutralised, fatliquored and stuffed.[4]

(iv) Combination Sulphur-Oil vegetable : This method in recent years has become very popular and extensively applied in the manufacture of picking band leather both with or without hair on. The process developed by C.L.R.I. (Madras) suggests that the delimed butts are sammed and treated with a mixture of fish oil and tallow in a drum at 45°C. After which the butts are hung up in a hot room at about 45°C for oxidation of fish oil. The oxidised oil provides oil tanning for the pelt. This is followed by vegetable tanning with a vegetable tan liquor of 75° Bkr. After complete tanning the leather is sammed and then stuffed.[5]

(v) Combination Alum-Oil-vegetable : Picking band is also reported to have been made by combination tanning of Alum-Oil vegetable. According to this process delimed pelts are pickled with calgon (Sodium hexa-metaphosphate) and acid, followed by tanning with 10—12% basic Aluminium sulphate, taken on the weight of the pelt. The leather is then washed, neutralised, fatliquored, sammed and treated in a drum with tallow and fish oil for oil tanning. This is followed by tanning in vegetable tanning solution containing 7—10% of tannin on the weight of the pelt. The leather is lastly oiled up.[6]

Regarding the physical and physico-chemical properties of picking band leather and their co-relation with the method of treatment Stather and Schmidt[7] have studied the effect of the kind of tannage, intensity of tannage and oiling of leather on the tensile strength and stretchiness. Their findings have thrown some light on the leather characteristics so far as ox-hide is concerned. The highest tensile strength for the wet product is that of raw, untanned and dehaired hide, followed by the pelt which is dehydrated with alcohol. The strongest dry leather is obtained from sulphur tanned hide to which dry raw hide comes next in strength. The weakest is formaldehyde tanned leather. The leathers tanned with syntan

or vegetable tannin are stronger but not equal in strength to Chrome-tanned, Alum-tanned or Sulphur-tanned leathers. Variations of Chrome, alum or tannin contents of the leather exercise little effect on strength. Wet raw hide is the most stretchy and next to it is formaldehyde tanned leather. Sulphur-tanned leathers show the most stretch when dry. Treatment with grease has a marked effect and hand-stuffed chrome leather is almost as strong as untreated raw hide. The strength of vegetable tanned leather increases with greasing but not to the same extent as Chrome tanned leather.

Dey and Chakravorti,[8] however, are of opinion that the tensile strength of the chrome tanned picking band decreases with the increase of Cr_2O_3 content and also with increase of basicities of Chrome-compound used in the tanning.

Sen, Dasgupta and Chakravorti[9] have found that 2.5% Cr_2O_3 based on the weight of the pelt is the optimum concentration of Chrome for strong picking band leather.

Basu and Mitra[2] have studied the physical properties of picking band leathers made both from foreign ox-hides or Indian buffalo hides. According to them full chrome-picking bands yield maximum elongation, tensile strength and thermal resistance. Full vegetable tanned picking bands yield minimum elongation and strength. Thermal resistance is also low in comparison with full chrome ones. Combination tanned picking band leathers yield elongation in between above two groups. Tensile strength appears to be as good as full chrome leather. Thermal resistance is comparatively low. Hairy picking bands yield slightly less elongation than the plain ones and this is perhaps due to the presence of epidermal layer, hair roots, glands etc. forming comparatively a compact structure. But there is no remarkable difference in strength. Picking band from buffalo hide is more stretchy than that from foreign ox-hide whereas the former shows better strength than the latter.

Sirkar and Mitra[10] say that buffalo hide appears to be less compact and somewhat porous. Inspite of this, buffalo hide is in no way inferior to foreign ox-hide because in the case of buffalo hide it is found that it possesses high tensile strength with low angulation, together with the thickness which is essentially required in picking band leather. Low angulation of fibres with developed reticulin sheath and a more or less balanced distribution of tissues also exist in the buffalo hides.

As already stated, the tensile strength of picking band is an important criterion. This physical property is dependent on the firbous structure. Guha and Banerjee[11] have studied the microstructure of this type of leather and according to them tensile strength increases (i) with the decrease of angle of weave and (ii) with the increase of splitting of the fibres, and (iii) with the increase of compactness of weave.

As (i) splitting value, (ii) angle of weave and (iii) compactness of weave are responsible for high tensile strength of picking bands, these points should

always be considered in every step of manufacturing picking band from the selection of raw hide to the finishing of the leather.

Raw material : *It has been found that hides of She-buffaloes are preferable* to those of he-baffaloes as the former are closer in texture and tougher in substance than the latter. Green buffalo-hides are the best raw material for the picking bands.[12]

About cured hides, Dempsey[13] says that dry hides are normally more compact than the wet-salted hides and according to Dam, Dalal & Banerjee,[14] the method of curing affects the tensile strength of the hide. Dry hides (frame drying) have been found to be better than wet-salted hides which have been kept for a long time. Due to frame drying angle of weave of the hide remains horizontal as that of green hide. But dry salted hides possess higher angle of weave due to drying by salting in an ustretched condition.

Soaking : Soaking plays an important part in the manufacture of all types of leather because of the fact that the fibres of hides and skins become contracted and coalesced together in the cured stocks. The salt cured or dried hide reaching a tannery contains less than its physiologic water content. It contains proteins, which are originally in a liquid state but after curing change into a partially dried and coagulated form. The objects of soaking are to rehydrate the skin proteins; to partially solubilize and remove the denatured proteins; to open up the contracted fibre structure; to remove the curing salts and other extraneous matters.[15] It thus helps all the fibre-bundles and fibres of the hides to come in contact with the reacting chemicals with which the hides are treated. Water used for soaking, which is absorbed by the cured hides, also serves as a diluent and vehicle for carrying all astringent chemicals uniformly into the hide.[16]

The extent of soaking and reabsorption of water by the hide depends upon the time and temperature. Increase in time and temperature enhances the soaking effect. There are, however, definite maximum limits to both time and temperature because of the danger of bacterial degradation of the hide.[16] Procter[17] has considered 10°C as a limit of safety in soaking. But according to Goetz[16] the temperature of soaking and washing may range between 50°F and 85°F for different conditions of the tanneries and particularly when hides are soaked for too short a time. McLaughlin and Theis[15] studying the effect of temperature of the soak liquors, indicate that the swelling of the hide decreases as the temperature of the soak liquor increases above 20°C but it is accompanied by increased solution of nitrogenous matters formed by the hydrolysis of the hide. The effect is not merely the result of increased solubility of collagen and other proteins at the higher temperature but it is also brought about largely by bacterial growth digesting hide substance. A sharp increase of bacterial growth occurs after 16 hours soaking at 20°C.

It has been found that a 6% salt solution is sufficient to restrain bacterial action. For soaking dry hides containing coagulated interfibrillary proteins, alka-

line soaks are preferred because collagen fibre swells in a strong alkaline solution. One quarter percent alkalies such as caustic soda and sodium sulphide are recommended for soaking.[18] Some of the polyvalent salts such as sodium citrate and pyrophosphate are reported to have better solubilizing effect on the coagulated protein and give efficient soaking for dried hides.[18,19]

Pleass[20] says that the addition of sodium chloride, sodium nitrate or acid solutions of sodium bisulphite are very beneficial to the soaking of hides. Better result can, however, be obtained by using mixture of sodium chloride and nitrate in conjunction with a small amount of alkali.

Roddy and Hermoso[21] have found that the addition of sodium polysulphide to the soak is very effective in accelerating the soaking process of both salted and dry hides; for dry hides they recommend a polysulphide concentration of 0.3% on the soak solution basis, proportionately less polysulphide being employed for the salted.

Soaking of the air-dried hides in dilute solution of common salt facilitates dissolution and removal of some of the coagulated proteins.[15]

Use of bactericides become necessary when the soaking period is or has to be prolonged due to the peculiar nature of the hide. The maintenance of a pH 4.5 to 5.5 in the soak liquor by the use of organic acids is also effective in arresting the bacterial action.[16]

Liming : Liming in the case of picking band leather is primarily done more for the purpose of splitting of the fibre and for the disolution of globular proteins than for unhairing. Picking band is manufactured with hair on from ox and steer hides also and in that case liming is totally avoided.

Loosening of hair and epidermal structure and saponification of natural fats of the hide take place in liming. Besides, liming also swells the hide and puts it in the chemically suitable condition to receive and combine with tanning reagents.[22]

Both physical and chemical effects of liming on the hide are subject to a number of factors such as time, temperature, causticity concentration, and mechanical agitation given.[23]

The rate of digestion of hair is increased by increasing the temperature of liming but at the same time hydrolysis of the protein also takes place at a rapid rate causing degradation of the quality of hide. A startling increase in digestion takes place when the temperature exceeds 85°F.[24]

Presence of Sodium sulphide and sodium hydrosulphide increases unhairing action of lime.[23] Sulphides of arsenic, tin, lithium, aluminium, ceseium, magnesium, calcium, strontium and barium are also capable of accelerating the unhairing action of lime. Sulphides of other metals have not, however, any such effects.[25]

For convenience of unhairing McLaughlin and Theis[26] suggest the proportion of lime liquor to hide to be kept at 4:1.

Addition of Sodium sulphide to lime liquor increases its pH value and plumping effect. The plumping may be so excessive that it may, sometimes, prevent proper splitting up of the fibres into fibrils.[27] A solution of sodium sulphide of 2° Be removes hair with less swelling of hide and some depilatory methods have been suggested to destroy hair in strong sulphide solutions using only a minium percentage of lime to accelerate plumping action and to avoid excessive swelling.[28] The rate of dissolution of hair increases with increasing concentration of sulphide and pH value of the depilatory solution. The unhairing effect is negligible below pH 11.[28] Depilation in pure sulphide may tend to produce flat and firm leather disappointing for most purposes.[23]

Sodium hydrosulphide in lime liquor causes little change in the pH and plumping effect.[29] The use of sodium hydrosulphide replacing the sulphide in lime-sulphide paint, allows for better control of swelling effect on the hide.[28]

In the lime-arsenic sulphide liquor or paste the alkalinity is even lower than in plain lime but its depilatory action is very pronounced.([27, 29])

Calcium hydrosulphide added to lime liquor decreases solubility of lime and lowers its pH value but increases the unhairing action.[30]

Calcium chloride and ammonium salts added to lime liquors and lime sulphide pastes mellow the action of lime in respect of its alkalinity while soda ash and sodium and potassium salts increase the plumping effect and the alkalinity of the lime liquors.[27]

Polysulphides do not unhair so efficiently as sulphides and sulphohydrates.[51] Reducing agents like cyanides, thioglycolates and to a lesser extent sulphites accelerate the depilatory action of lime while oxidising agents retard it.[31]

Turley and Windus[32] have found that many organic compounds containing sulphydryl group or capable of reacting so as to form this group, have marked depilatory action. Amines and some of the mercaptans possess depilatory action which depends upon the molecular structure of the compound. Aromatic amines, tertiary amines and thiols compounds in which the—SH is attached directly to a carbon atom of a benzene ring, have no unhairing property. Some of the strong inorganic reducing agents such as thiosulphates and sulphites have very little or no depilatory property.

Thioglycolic acid at pH 12 rapidly dissolves keratin and has pronounced depilatory action.[33]

McLaughlin and his co-workers[34] have fouhd that old lime liquors which contain amines formed by decomposition of skin porteins have better hair loosening property than fresh lime. A similar effect is produced by addition of monomethylamine and ethylenediamine but trimethylamine and ammonia have no such effect. Dimethylamine is superior to monomethylamine in depilatory action.

Moore[35] has found that a large number of compounds containing nitrogen such as hydrazine, guanidine, aminoguanidine, tetramethylammonium hydroxide and possibly n-propyl-, n-butyl-, and diethylamine accelerate the unhairing action of lime liquors to various degrees. Those nitrogen compounds that do not speed up unhairing, and in some cases even delay it, include all those in which a phenyl group has replaced a hydrogen atom (e.g. benzylamine, phenyl hydrazine), those in which oxygen or sulphur has replaced the imino group (e.g. urea and thiourea), all aromatic nitrogen compounds (aniline etc.), all amides and a variety of non-amino nitrogen compounds.

Sharp unhairing liquors penetrate at a faster rate into the hide from both grain and flesh surfaces than the mild unhairing solution of lime.[36]

Animal proteases (pancreatin) can also be used for depilatory purpose. Enzymes of vegetable origin or secreted by molds and bacteria have got depilatory activity.[37,38]

The useful action of liming, according to Wood,[39] is the dissolving of inter-fibrillary substance with the consequent separation of the fibre bundles into fibrils. McLaughlin and Theis[40] are of opinion that removal of cementing substance including albumin and globulin at least to some extent from hides is desirable. Albumins and globulins which are ordinarily soluble in water become less soluble after curing by air-drying. Since the denatured albumins and globulins are appreciably soluble in dilute salt solutions, soaking removes some of these proteins.[16] Liming is the next step at which the removal of globular protein can be affected, and Roddy[14] says that sulphides and dimethylamine sharpened lime suspensions are more effective than straight lime liquor in removing albumins and globulins from the hide.

The correlation of the extent of the removal of albumins and globulins with the properties of the final leather has not been studied.

Regarding the effect of liming on the chrome fixation Theis and Steinhardt[42] have found that the various ways of liming and increased liming time have practically no effect on Cr_2O_3 fixation.

Gustavson and Widen[43] have, however, reported that increased liming time upto 2 weeks progressively increases the level of chrome binding and the degree of vegetable tannage in comparison with unlimed hide. Sadikow[44] has observed that liming increases the uptake of vegetable tannin by collagen but decreases the uptake by elastin and keratin.

Straight lime gives a more elastic leather than the more alkaline unhairing liquor.[45]

Rezabek[46] has compared the properties of leathers obtained from hides unhaired by lime-sulphide liquor with leather obtained from hides unhaired by razor. The pieces unhaired by the razor give the lower weight yield and degree of tannage but have a higher tensile strength. Sen, Dasgupta and Chakravarti,[9]

however, have found that plain picking band leathers obtained from hides which are limed and pickled, give higher tensile strength than hairy picking bands obtained from hides which are only pickled.

According to Conabere and Merry[47] lime with 0.1% dimethylamine gives better fibre structure to the limed stock than lime alone.

Chakravorti and Dam[48] have studied the effect of duration of liming on the tensile strength of chrome tanned picking band and they have found that the decrease in tensile strength is more prominent after 6 days liming.

The action of unhairing chemicals becomes astringent on the hide surfaces resulting in cracky-grained leather when hides prior to liming are soaked for too short a time and/or too low a temperature.[16]

Deliming : In the case of picking band leather the purpose of deliming or other similar process is mainly for the removal of lime to the various extent, depending upon the process of tanning subsequently followed. The question of removal of non-essential protein at this stage, as generally achieved by the process of bating or the cleansing of the pelt as obtained by drenching, is not essential in the case of manufacture of picking band.

Lowering of alkalinity of the surface and removal of a part of lime present in the pelt are necessary in the case of picking band. Chemical deliming is, therefore, considered to be most suitable method. Weak acids such as boric and lactic are considered to be the most suitable than somewhat stronger acids such as sulphuric, hydrochloric, formic, acetic etc.

Ammonium chloride as a deliming agent dissolves quite an appreciable amount of proteins though it is not known whether these are interfibrillary substance of the collagen itself. The result is obvious and a much looser structure will result. In that respect Ammonium Sulphate is preferable.[49] In general all halides increase the hydrolysis of hide substance, whereas sulphates inhibit it.[50]

To secure firmness and plumpness required for the heavy belting and hydraulic leathers, the pelts should be surface delimd. But the pelts for the manufacture of picking band leather are delimed to a greater extent for more flexibility.[3] Over deliming is, however, carefully avoided to maintain the tightness of the grain of the leather.[51] The flexibility of the leather does not only depend on the extent of deliming but also depends upon other factors such as thoroughness of tanning, the extent of fibre lubrication and the extent of removal of cementing substance.[3]

Pickling : It is an important process in the manufacturing of pickling band leather so far as chrome tanned picking band is concerned. In other processes of tanning such as in the combination tanning process of sulphur-oil-vegetable, the object of treatment of pelt in a solution of acid is for the liberation of sulphur from the solution of hypo with which the pelt is subsequently treated.

The object of pickling as a pretreatment to chrome tanning is to bring the pH of the pelt down to such a level as to cause quick and uniform penetration of the chrome tanning salt to the pelt. The acidity of the pelt reduces its tendency to fix up immediately with the basic chrome compound on the surface.[52]

Kibria[51] has stated that 1.6 to 1.8% sulphuric acid on the weight of the pelt, is necessary in the case of pickling the pelts for chrome-tanned pickling band leathers. For increasing the strength and resistance to heat, a treatment with hypo after the pickling is necessary.

According to Wolf[53] it is immaterial whether, pickling is done with hydrochloric acid, if the salt used is sodium chloride. Pickling with organic acids to obtain a masking effect later, is not helpful. The masking agent should be added to chrome liquor.

The acid continues to be absorbed by the hide until an equilibrium is established. Most of the pickling solution has an equilibrium pH value ranging from 1.5 to 2.|5[15]

In the case of hydrochloric acid-sodium chloride pickle the absorption of hydrochloric acid by the pelt is greatest when the concentration of the salt is between 0 and 20% whereas above 20% concentration of salt the effect upon acid absorption for any concentration of acid is but slight. At values between 10 and 22.5 per cent salt, increasing amounts of acid in pickle liquor has but little effect on the swelling of the hide.[54]

In the Sulphuric acid-sodium chloride pickle the effect of sodium chloride in the acid absorption to a maximum occurs at a lesser concentration of sulphuric acid than the concentration of hydrochloric acid in the case of hydrochloric acid—sodium chloride pickle. In the sulphuric acid system 400—500 millimols of salt per litre of pickle liquor are sufficient to prevent swelling for all concentration of acid used.[54]

Regarding the effect of temperature Theis and Goetz,[55] have found that increase in temperature upto 32°C apparently increases the acid absorption from the sulphuric acid-sodium chloride pickle liquor. Above 32°C the acid absorption decreases gradually but the percentage of the dissolved nitrogen in the pickle liquor increases showing greater rate of hydrolysis of protein at higher temperature. The absorption of acid is more or less constant after 8 hours, although the majority of absorption takes places with the first 2 hours of pickling.

It has also been found that the final pH value of the sulphuric acid-sodium chloride pickle liquor is increased with increasing time and temperature during the early stages of pickling, but when the treatment period is extended to 18 hours or more, further rising of pH is not observed, because state of equilibrium is probably attained during this increased time.[55]

Sulphuric acid-sodium chloride pickle liquor gives a more firm and solid leather than the HCl-NaCl system. Hence the former is preferred.[15]

Theis and Serfass,[56] have studied the float factor in the case of HC1-NaC1 pickle and found that, if the concentration of salt and acid in pickle liquor is maintained uniformly constant, there is practically no variation in the result of pickling with the change of float ratio. This indicates that the float has very little effect on the absorption of acid and salt.

Theis and Serfass,[57] have investigated the effects of various acids such as phosphoric, acetic and oxalic, used in the pickling with NaC1. By using 1.5% in each case, it has been found that less than 66% of phosphoric acid is absorbed at all concentrations of salt. The absorption of acetic acid increases with salt content of the pickle and the absorption of oxalic acid decreases with increasing salt concentration. In the case of HC1 or H_2SO_4, almost entire quantity of acid is absorbed at any salt concentration.

Sometimes alum along with salt or with acid and salt, is used for pickling. The effect of alum pickling is not fully ellucidated. Theis and his students[15] have made a study of various alum pickles and found that, when bated skin is pickled in aluminium sulphate solution, more Al_2O_3 than SO_3 is taken up at low concentrations, whereas at high concentrations more SO_3 than Al_2O_3 is absorbed. Addition of neutral salts to aluminium sulphate pickle increases a greater absorption of Al_2O_3 than SO_3 and represses the swelling of the skin.

(To be Continued)

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INDIANS' BELIEF IN COUNTRY'S ECONOMIC FUTURE HAS DIMINISHED: RAGHURAM RAJAN, (FORMER GOVERNOR, RBI)

Indians' belief in the country's economic future has diminished in the recent years, with the COVID-19 pandemic taking a further toll on sentiment while pushing many middle-class citizens into poverty, former RBI governor Raghuram Rajan has said.

Virtually addressing an event organised by the NALSAR University of Law, Rajan further said the domestic stock market is booming but that does not reflect the reality that many Indians are in deep distress.

"In recent years we have gotten a little less confident. "Our belief in economic future has diminished...the pandemic toll has further diminished our self-belief or 'atma vishwas' even further while pushing many in the middle-class into poverty," he said. The Reserve Bank of India (RBI) has lowered the growth projection for the current financial year to 9.5 per cent from 10.5 per cent estimated earlier, while the IMF has projected a growth of 9.5 per cent in 2021 and 8.5 per cent in the next year.

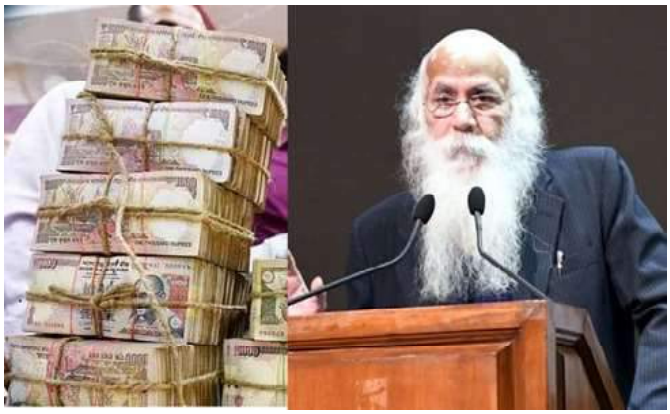
Rajan further said the thrust of the economic programmes should be to create good jobs, while lamenting that states are increasingly reserving employment for locals, undermining the idea of India."As our economic performance is diminishing, our democratic credentials, our willingness to debate, to respect and tolerate differences is also taking a hit, not just at the Centre but in many states.

"You know community sentiment is very easily hurt," he said. He also stressed on the need for India joining international trade agreements. Rajan, currently a professor at the University of Chicago Booth School of Business, noted that any attempt to keep a large part of a country's population down is morally wrong.

"Growth that does not take everybody along, is unsustainable," the eminent economist observed. Rajan also emphasised that there is a need to protect fundamental rights under all circumstances, saying, "When we suppress debate and criticism, it leads to poor one-size-fits-all uninformed policy choices, with little course correction."

(PTI – 29/10/2021)

DEMONETISATION COST INDIA RS. 10 LAKH CRORE'



"None of the goals set out by the Prime Minister in his speech on November 8, 2016, have been achieved." Professor Arun Kumar tells *Rediff.com*'. He also said 'Those who should have been affected benefitted from demonetisation.' 'And the vast majority who should not have been affected lost out.'

'That is the ultimate result of demonetisation.' It is well known now that demonetisation destroyed India's unorganised sector completely. The unorganised sector contributes 45% of India's

GDP and employs 94% of the workforce. That means if you hit the unorganised sector, you are hitting most of the workers and a large part of the output in the economy.

Demonetisation hit the organised sector too, but the unorganised sector got hit much more. While the organised sector can use various means for transactions, it is the activities of the unorganised sector that were impacted for several months.

It has not recovered even today...

That is because after demonetisation came GST in 2017 and then the pandemic. The GST hit them very hard and further, it resulted in demand shifting from the unorganised sector to the organised sector. After demonetisation, sufficient currency came back after 9 months.

If not for the GST that came after eight months, the unorganised sector would have started to recover. Then came the pandemic which hit them the hardest. That's why the recovery has not happened yet.

The other day Shashi Tharoor described demonetisation as foolish and whimsical.

Yes. See, it did not impact the black economy. It could not stop the counterfeiting of currency. It did not impact terror activities like terrorism is not funded by counterfeit currency alone. While there were no gains, my estimate is that the economy lost Rs 10 lakh crore of output.

Agriculture was also hit and the farmers' incomes were affected. It means every part of the unorganised sector got hit by demonetisation. So, none of the goals set out by the prime minister in his speech on November 8, 2016, have been achieved.

Very quickly the government started to shift the goalpost and started talking about a cashless economy. This was a mistake; they should have talked of a less-cash economy because it will take decades to be a cashless economy.

Anyway, one was moving towards a less-cash economy as people had started using more debit cards, credit cards, net banking, etc. Demonetisation by itself has little to do with India becoming a less-cash economy.

The recent SBI report says that in the financial inclusion metric, India is ahead of China now, and it is due to demonetisation. Do you agree with the argument?

No. We have been trying ideas like Jan Dhan account for quite some time and that has nothing to do with demonetisation. You can push all these ideas like digitisation without doing demonetisation. A country like Norway has hardly any cash in the economy and it is not due to any demonetisation carried out there.

My argument is that these things are a result of technological change, independent of demonetisation.

So, you maintain that it was a monumental blunder?

Yes, it was a big blunder. You incurred a loss of Rs 10 lakh crore without reaping any benefit. The mistake was of identifying black with cash. So, demonetisation was a big mistake.

My question still is, why was it done?

When the BJP came to power in 2014, it had promised people that there was so much black money abroad and when they brought it back to India, each family could get Rs 15 lakh!

The fact is, we don't know how much money is there abroad, we don't know where it is lying and we don't know how to get it back. The ruling party realised they made a false promise and Amit Shah went on to say, it was a '*chunavi jumla*'.

But what happened was, they were accused all the time of not delivering on their promise. Nitish Kumar used it effectively to defeat the BJP in Bihar. The crucial UP elections were coming

and they had to counter the impression of having failed. So, they brought in the Income Declaration Scheme in June 2016. By September, it was clear that it was a failure; that hardly anyone declared their black incomes.

So, they needed a big bang. They thought demonetisation would be a politically correct big bang decision. As the general public think 'black is cash', the BJP thought people would believe they did the right thing. They wanted to tell people that they were doing it to stop black money.

The prime minister told people that it was a short-term pain for long term gain and people believed him.

Even today, do you think the people of the country believe that demonetisation helped stop black money in the economy?

No. In fact, after the UP elections, demonetisation was never used by the BJP in any other election. They realised that the more they spoke about it, the more people would remember the pain. The BJP realised that politically, it would not give them any brownie points. The BJP knew that people would ask, where is the money that was demobilised and where is the money that has come back?

Five years after demonetisation, where do you think the Indian economy stands?

The impact of demonetisation affecting the unorganised sector still continues. That is because the impact of demonetisation was overlaid by the impact of GST and the lockdown. As I said earlier, we would have recovered from demonetisation after some time.

It is clear that the economy was slowing down even before the pandemic. For eight quarters, the economy's growth had slowed down from 8% to 3.1%. When the unorganised sector declined and the organised sector grew, disparities in the economy increased.

When disparities grow, demand falls short. It is expected when 94% of the workforce lose their income. When demand in the economy becomes short, capacity utilisation comes down. When capacity utilisation declines, investment declines and with that the growth rate. The investment that was 36.5% in 2012-2013 declined to 30%. So, both consumption and investment were hit.

So, I call the situation a policy-induced crisis. During the UPA time, the global financial crisis came from outside. Added to that were the corruption cases and policy paralysis. After Modi came, a recovery had already started in 2014. Then in 2016, they struck a growing economy with this.

So, this crisis was created by bad policy, and it was unnecessary.

Self-induced torture?

Those who never earned any black income, and the unorganised sector have been the worst sufferers due to this exercise. And those who generate black income continue to do so, and they converted their black cash into new notes. Those who should have been affected benefitted from demonetisation. And the vast majority who should not have been affected lost out.

That is the ultimate result of demonetisation.

(Rediffmail.com – 17/11/2021)

SLOW GROWTH: NO CLEAR SIGNS OF INDUSTRIAL REVIVAL

Finance minister Nirmala Sitharaman has said the economy hasn't so far reached the level where liquidity support could be rolled back by the Reserve Bank of India (RBI). Of course, while retaining the repo rate last month, the RBI raised its inflation forecasts. Retail inflation inched up to 4.48% in October from a six-month low of 4.35% in September but remained within the central bank's target band (2-6%) for a fourth straight month, showed official data released on Friday.

The growth in the index of industrial production (IIP) slowed to 3.1% in September from 12% in the previous month, as the impact of the low base waned. But the IIP still turned out to be 5.7% higher than the pre-pandemic (September 2019) level, suggesting industrial activity may be gradually returning to normalcy, though a sustained recovery is still away.

While the finance ministry in a recent report saw prospects of a revival of the investment cycle, this was not corroborated by the latest data on industrial production; capital goods output grew only marginally in September. The rise in inflation in October, albeit marginal, remained broad-based and pointed at revival of demand ahead of the peak festival season, which may have allowed producers in select sectors to pass on the spurt in input costs.

However, given the recent cut in fuel taxes by the Centre and about two dozen states, inflationary pressure is expected to drop in November. This will ease pressure on the central bank for any early liquidity normalisation (in December meeting), and its accommodative stance could continue for a longer time despite external headwinds.

The global commodity prices, especially of oil, have been on the rise and the US Federal Reserve has signalled its intent to start scaling back its $120 billion-a-month quantitative easing later this year. Interestingly, US inflation hit a 31-year high of 6.2% (much higher than India's) in October, reflecting rising global commodity prices, persistent supply shortages and strong consumer demand.

Inflation in food products, which make up for about a half of the inflation basket, rose a tad to 0.85% in October from 0.68% in September but fuel and light inflation continued to stay elevated at 14.35%, against 13.63% in the previous month. Core inflation remained sticky at 5.8% in October, against 5.6% in the previous month. The excise duty cut by Rs 5 per litre on petrol and Rs 10 on diesel by the Centre and the reduction in value added taxes by many states in November will likely weigh down indirect price pressure (in transportation, etc) emanating from fuel.

Finance minister Nirmala Sitharaman has said the economy hasn't so far reached the level where liquidity support could be rolled back by the Reserve Bank of India (RBI). Of course, while retaining the repo rate last month, the RBI raised its inflation forecasts. Capital goods output grew just 1.6% in September against 19.9% in the previous month. Consumer goods output shrank even ahead of Diwali. While consumer durables output contracted by 2%, non-durables dropped 0.5%.

Barring mining, which grew 8.6% in September, the growth of manufacturing and electricity remained lower than expected at 2.7% and 0.9%, respectively. Heavy remains seem to have impacted industry adversely while chop shortage has hit auto units. Aditi Nayar, chief economist at Icra, said the direct impact of the reduction in central excise duty on fuel on the November CPI inflation could be about 30-35 basis points, with a somewhat smaller impact of the varied VAT cuts by states. "As the base effect wears off, and the pressures related to coal, metals and logistics costs come to the fore, we expect the CPI inflation to return to an uncomfortable range of 5.0% to 6.0% in December-March this fiscal," Nayar said.

DK Pant, chief economist at India Ratings, said both consumer durables and non-durables recorded negative growth in September from a year before. "This shows that despite the onset of the festival season, the industrial output has remained subdued," he said. However, this appears to be in contrast with the recent retail sales figures reported in the media.

(Financial Express – 13/11/2021)

STATES SHOULD GET SOME PART OF CESS, SURCHARGES COLLECTED BY CENTRE, SAY EXPERTS

There is a need to share at least some portion of the cess and surcharges collected by the central government with the states, experts said recently.

They were participating in a seminar on 'Re-imagining Fiscal Federalism' organised by the city-based think tank NCAER. Responding to the various issues flagged by Finance Commission chairman N K Singh, Tamil Nadu Finance Minister Palanivel Thiagarajan made a case for giving more fiscal autonomy to the states.

A similar opinion was expressed by former Kerala Finance Minister Thomas Isaac, who underlined the need for rolling back the fiscal control of the central government and giving the freedom to the states to at least increase the State GST rates.

Rajya Sabha MP and former Bihar Finance Minister Sushil Modi opined that some portion of the cess and surcharges collected by the central government should form part of the divisible pool, which is shared with the states as per the recommendations of the Finance Commission.

"I feel like there should either be some inherent limitation on how much this (Cess) can be levied or there should be some requirement that it should be in the divisible pool. "We have a one-sided kind of system where there is no limit or ceiling or cap on the cesses and that it doesn't require to be in the divisible pool. I think is a skewed balancing of rights," said Thiagarajan. Modi too said there is a need to work out some kind of formula so some part of the cess should become part of the divisible pool.

On the cess issue, Singh said that following any of these paths will require a constitutional amendment because the constitutional amendment introduced in 2000 specifically kept cess out of the divisible pool. Responding to a question, the former Bihar finance minister also said that under the current dispensation it would not be possible to bring petrol and diesel under the ambit of the Goods and Services Tax (GST).

"I don't think it is feasible to bring petrol, diesel, and other petroleum products under GST in the near future," he said. According to him, the combined revenue loss by bringing motor fuel in the ambit of GST would be about Rs 4 lakh crore. In his response, Thiagarajan said more and more products should actually be left to the states.

"So, I would be for more product staying within the states and less going into GST as a fundamental principle," he said. Initiating the discussion, Singh said fiscal policies in the country are marked by 3 Cs — complexity, confusion and contradiction. The 15th Finance Commission was constituted by the President in November 2017 under the Chairmanship of N K Singh to make recommendations for the period 2020-2025.

It recommended the share of states in the central taxes for the 2021-26 period at 41 per cent. This is less than the 42 per cent share recommended by the 14th Finance Commission for the 2015-20 period. The adjustment of 1 per cent is to provide for the newly formed Union Territories of Jammu and Kashmir, and Ladakh from the resources of the Centre.

-: JILTA :-

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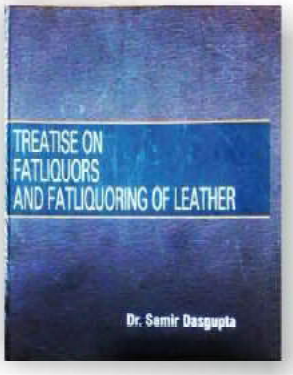

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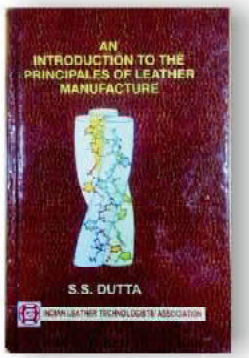

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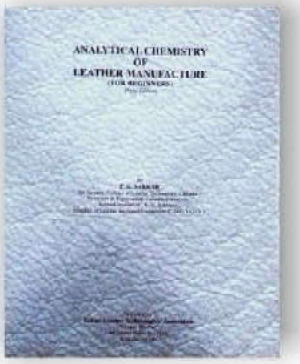

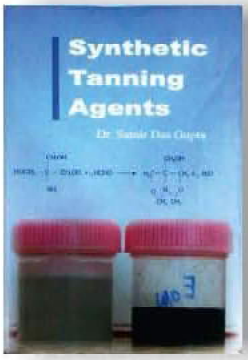

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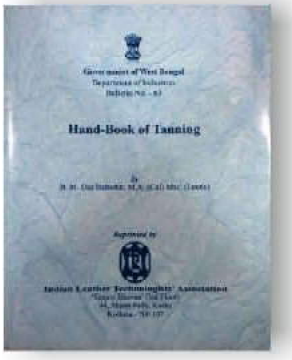

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History and Activities of Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the originator of Das-Sibsamy theory and father of Indian Leather Science on 14th 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.
- As the part of many social activities ILTA has donated Rs. 1 lac to Consul General of Nepal towards relief of earthquake effected of Nepal on 15th Sept, 2015.

INTERNATIONAL & NATIONAL SEMINAR

- ILTA is the Member Society of International Union of Leather Technologists & Chemists Societies (IULTCS), a 115 years old organization and for the first time the IULTCS Congress was organized in January 1999 outside the developed countries in India jointly by ILTA and CLRI.
  2017 IULTCS Congress is scheduled to be held in India again.
- 6th Asian International Conference on Leather Science & Technology (AICLST) was organized by ILTA in 2010 during its' Diamond Jubilee Celebration year.

SEMINAR & SYMPOSIUM

ILTA organize Seminar & Symposiums on regular basis to share information, knowledge & latest development and interactions for the benefit of all concerned. Few are as under :

- Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14th August every year.
- Sanjoy Sen Memorial Lecture on 14th January every year, the birthday of our late President for several decades.
- Prof. Moni Banerjee Memorial Lecture on 15th March every year, the birthday of the iconic personality.
- Seminar on the occasion of India International Leather Fair (IILF) at Chennai in February every year.

It has also organized :

- Prof. V. Nayudumma Memorial Lecture.
- Series of Lectures during "Programme on Implementing Emerging & Sustainable Technologies (PrESTy)".
- Seminars in occasion of India International Leather Fair, 2014 and 2015 at Chennai etc. 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.

PUBLICATION

ILTA have published the following books :

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

ILTA has a good Library & Archive enriched with a few important Books, Periodicals, Journals etc.

AWARDS OF EXCELLENCE

- ILTA awards Prof. B. M. Das Memorial, Sanjoy Sen Memorial, J. M. Dey Memorial and Moni Banerjee Memorial Medals to the top rankers at the University / Technical Institute graduate and post graduate levels to encourage the brilliants to evolve with the Industry.
- J. Sinha Roy Memorial Award for the author of the best contribution for the entire year published in the monthly journal of the Indian Leather Technologists' Association (JILTA).

LEXPOs

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, Siliguri & Durgapur, ILTA has organized LEXPO at Bhubaneswar, Gangtok, Guwahati, Jamshedpur and Ranchi.

MEMBERS

The Association's present (as on 31.03.2016) strength of members is more than 600 from all over India and abroad. Primarily the members are leather technologists passed out from Govt. College of Engineering & Leather Technology, Anna University, Chennai, Harcourt Butler Technological Institute, Kanpur, B. R. Ambedkar National Institute of Technology, Jalandhar and Scientists from Central Leather Research Institute.

ESTABLISHMENTS

In order to strengthen its activities, ILTA have constructed its own six storied building at 44, Shanti Pally, Kasba, Kolkata – 700 107 and have named it "Sanjoy Bhavan".
This Association is managed by an Executive Committee duly elected by the members of the Association. It is absolutely a voluntary organization working for the betterment of the Leather Industry. None of the Executive Committee members gets any remuneration for the services rendered but they get the satisfaction of being a part of this esteemed organization.

ILTA
Since 1950

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

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