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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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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

!! Natural Leather or Leather Alike !!

Now the time, situation and craziness for non – leather products are making leather industry, leather lovers think all together in same wavelength for the future of leather industry.

We, the leather industry do use by product of meat industry only. Therefore, the leather industry should not be fully blamable for the hypes of pollution raised against it and own full liability for alleviation of pollutional gravity as social menace. If the tanning industry does opt for no use of hides i.e. the tanning industry does not exist, the societal hazards are easily imaginable by us all. Therefore, the meat industry and other auxiliary industry associated directly and indirectly with tanning industry share meaningful responsibilities for erasing the blemishes of leather industry and promote use of leather for natural cause.

In this regard, we will share our shoulder for the Association *Leather Naturally* towards the noble cause of sustenance of natural leather.

Leather Naturally is an Association established in the Netherlands – Chamber of Commerce.

Leather Naturally promotes the use of globally-manufactured sustainable leather and seeks to inspire and inform designers, creators, and consumers about its beauty, quality and versatility.

But the reason, why!!

Leather is facing intense competition from synthetic materials manufactured from non-biodegradable petrochemical derivatives which are designed to imitate it. At the same time, leather is subject to attacks from pressure and very well funded groups such as Greenpeace and the animal welfare NGO PETA. The *Leather Naturally* initiative is aimed to counteract these attacks, highlight the natural beauty of leather and more importantly educate the buying public, designers and youth about leather and the leather industry. It is to the benefit of all stakeholders in the leather supply chain to help defend the leather industry against the negative publicity inspired by special interest groups. The positive aspects of leather such as it being a sustainable material with natural elegance have to be promoted while defending it against unchallenged reports designed to prejudice its image. Properly made and sourced leather is a truly sustainable material. Hides and skins are mostly a by-product that is dependent on the meat and dairy industry. Transformation into leather is the best use for those hides. The leather industry is creating a product that is both natural and long lasting - leather is unique in its ability to combine beauty, comfort and practicality. Given the extensive range of raw materials with different properties, and the many processes developed over time leather making is highly versatile and leather manufacturers can produce qualities with widely varied properties and looks.

But why we should go for natural leather in general!!

Beauty: leather can look and feel rich and luxurious. It can be created in a wide range of finishes and colours, and to achieve a balance between form and function. Many leather products become more beautiful and interesting with age; in fact, oftentimes the more you use a product, the more it acquires a unique character all its own.

Comfort: leather is comfortable because it can absorb perspiration - those with a natural finish can also help regulate temperature through breathability. Its fibrous construction has memory and shapes to your own use over time, be it a jacket, footwear, bag or wallet tucked into a pocket. And a range of textures is achievable, from soft and supple to firm and rugged. For example with gloves, in order to create a perfectly tight fit tanners adapt leather's stretch characteristics.

Practicality: leather offers protection from wind and cold, and can be made resistant to rain and snow. It is durable, and can usually be easily cleaned. Quality leather is most often made into products that are timeless, fashionable classics that will last a long time.

Leather is a sustainable material: Properly made and sourced leather is a truly sustainable material. Hides and skins are mostly a by-product dependent on the meat and dairy industry. Transformation into leather is the best use for those hides and

skins. The leather industry is creating a material that is both natural and long lasting.

Almost any skin can be used to make leather: Almost any skin can be used to make leather. To be named "leather" the skin must be essentially intact with its original fibrous structure. The hair or wool may, or may not, have been removed. Synthetic materials made to look like leather are sometimes incorrectly referred to as 'synthetic leather'. This term can be legally challenged when used as a marketing argument, and is clearly illegal in a number of countries.

Leather is unique in its ability to combine beauty, comfort and practicality: Hides can be manufactured to create a wide range of finishes and colors, and to achieve a beautiful balance between form and function. A leather product is durable and often becomes more beautiful and comfortable with age as it conforms to your own personal use, those with a natural finish can also help regulate temperature through breathability. Leather offers protection from wind and cold, and can be made resistant to rain and snow.

Leather tanning is a modern, safe and effective process: Various tanning methods are used for turning a hide into leather; the most well-known are chrome and vegetable tanning. All methods have a comparable environmental impact and are environmentally safe when the industry's best practices are followed.

Now, let us decide whether we should be for natural leather or opt for leather alike!!

Goutam Mukherjee

Dr. Goutam Mukherjee
Hony. Editor, JILTA


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From the desk of General Secretary

8th Moni Banerjee Memorial Lecture

Above was organized at 03.00 PM on Friday the 15th March, 2019 at Freya Design Studio, ILPA Leather Goods Park, Kolkata Leather Complex, Bantala, 24 Parganas (South).

Dr. Goutam Mukherjee, Associate Professor, GCELT and a life member of ILTA acted as the Master of Ceremony. After welcoming everybody and speaking briefly about Late Prof. Moni Banerjee, Dr. Mukherjee invited the following to garland the portrait of Late Prof. Moni Banerjee which was done.

1. Mr. Asit Baran Kanungo, Vice President, ILTA
2. Mr. P. K. Bhattacharjee, Vice President (NR) in the Central Committee
3. Miss Arpita Paul, Executive Director, ILPA
4. Mr. Susanta Mallick, General Secretary, ILTA
5. Daughter of Late Prof. Moni Banerjee
6. Mr. B. C. Jana, Representative of CLRI
7. Mr. Udayaditya Paul, Representative of GCELT
8. Mr. Souvik Santara, Representative of CFTC, Budge Budge
9. Mr. Agnimitra Roychoudhury, Representative of FDDI
10. Dr. V. Vijayabaskar, Vice President, Balmer Lawrie & Co. Ltd., Chennai
11. Mr. Tatheer Zaidi, Sr. Programme Manager, Solidaridad – Asia
12. Mr. Alok Kumar Basu, Representative of Alumni Association of GCELT

After garlanding was over, Mr. Asit Baran Kanungo, Dr. V. Vijayabaskar, Mr. Tatheer Zaidi, Mr. P. K. Bhattacharjee and Mr. Satyabrata Mukherjee, Ex-President, ILPA were requested to take their seats on the dias and Mr. Kanungo was requested to deliver his welcome address in which Mr. Kanungo briefly recalled the life and achievements of Late Prof. Moni Banerjee.

Today's speakers – Dr. V. Vijayabaskar and Mr. Tatheer Zaidi were then greeted with flower bouquets by Mr. Asit Baran Kanungo and Mr. Susanta Mallick respectively. Mr. Satyabrata Mukherjee was presented a flower bouquet by Mr. P. K. Bhattacharjee.

Names of the recipients of Moni Banerjee Memorial Medals were then declared and medals & certificates were handed over to them as stated below :-

1) Mr. Abhishek Rawat, Topper, Diploma in Footwear Manufacture & Designer Course Examination, 2018, Central Footwear Training Institute, Agra, U.P. received the medal & certificate from Mr. Asit Baran Kanungo.
2) Mr. Miraj Khaled, Topper, Diploma in Engineering Leather & Footwear Technology Examination, 2018, University Polytechnic, Aligarh Muslim University, Aligarh, U.P. Mr. Khaled Akhtar, the candidate's father received the medal & certificate from Dr. V. Vijayabaskar.
3) Mr. Y. Madhusagar, Topper, Diploma in Leather Technology Examination, 2018, Govt. Institute of Leather Technology, Hyderabad, Telengana received the awards from Mr. Tatheer Zaidi.
4) Mr. Aruva Shiva Prasad, Topper, Diploma in Footwear Technology Examination, 2018, Govt. Institute of Leather Technology, Hyderabad, Telengana received the awards from Mr. P. K. Bhattacharjee.
5) Mr. Souvik Santara, Topper, Diploma in Footwear Technology Examination, 2018, Central Footwear Training Centre, Budge Budge, West Bengal received the awards from Mr. Satyabrata Mukherjee.
6) Mr. Avijit Basak, Topper, Diploma in Leather Goods Technology Examination, 2018, Central Footwear Training Centre, Budge Budge, West Bengal was unable to attend. His medal & certificate will be sent by post.

Mr. Abhishek Rawat then made a presentation on the project he submitted during final year of his study.

Mr. Satyabrata Mukherjee, Ex-President, ILPA was then requested to say something. Mr. Mukherjee made a forceful presentation addressed to the students in particular.

Dr. Mukherjee, the Master of Ceremony then introduced Dr. V. Vijayabaskar to the gathering and requested him to deliver the

8th Moni Banerjee Memorial Lecture titled **"Exploring New Chemistries for Clean Leather Processing"**. After the lecture, Dr. Vijayabaskar was presented with a shawl, memento and a certificate by Mr. Susanta Mallick.

Mr. Tatheer Zaidi was next introduced to the gathering by Dr. Mukherjee and was requested to deliver his lecture titled **"Supply Chain Approach towards Pollution Management in Tanneries"**. After the lecture, Mr. Zaidi was presented with a shawl, memento and a certificate by Mr. Asit Baran Kanungo.

Mr. Susanta Mallick then offered sincere thanks to the speakers, members, faculties and students of GCELT, CFTC & FDDI and dignitaries from the Industry. Thanks were also expressed to ILPA for their kind permission to organize the event in their auditorium and to the family members of Late Prof. Moni Banerjee for their kind presence. Mr. Mallick reminded the members present of the Health Camp being organized on 17th April, 2019 by ILTA in collaboration with R. N. Tagore Hospital (Narayana Health) & Indian Medical Association, Dum Dum wing.

Wishing a bright future to the award winners Mr. Mallick requested all present to proceed to the dining hall next door for tea & refreshments.

Health Camp on Wednesday 17th April, 2019 at ILTA Office

As advised to ILTA Members with Kolkata Pin Code address vide letter dated 19.02.2019, a Health Camp will be organized at ILTA Office from 11.00 Hrs on Wednesday 17th April, 2019 where following tests will be carried out :-

Random Blood Sugar, Blood Group, Haemoglobin, Blood Pressure, Cardiac Consultation, Chest Test etc.

If you are interested to participate in the camp but have not registered your name yet, kindly do so by informing ILTA Office Tel. No. 2441 3429 / 3459.

Election Schedule for Reconstitution of Executive Committee of ILTA and the Regional Committees for the term 2019-2021

The Executive Committee of ILTA at its 517th Meeting held on 14.03.2019 approved the following schedule for Election of Executive Committee of ILTA and the Regional Committees for the term 2019-2021.

Sl. No.	Events	Election Schedule for 2019-2021	Day
1	Mailing of Nomination Papers & Voters' List on or before	02.05.2019	Thursday
2	Last date for receipt of Nomination Papers	24.05.2019	Friday
3	Last Date for Receipt of Consent	13.06.2019	Thursday
4	Last date for Withdrawal of Candidature	17.06.2019	Monday
5	Mailing of Ballot Papers on or before	06.07.2019	Saturday
6	Last date for receipt of Ballot Papers from Voters residing outside KMDA area & 24-Parganas (North & South)	03.08.2019	Saturday
7	Casting of Votes by Voters residing in KMDA & 24-Pgs (North & South) area at ILTA Administrative Office 10-00 to 17-00 hrs. LUNCH BREAK : 1-30 to 2-30 PM	02.08.2019 & 03.08.2019	Friday & Saturday
8	Counting of votes at ILTA Administrative Office from 11-00 hrs. onwards	05.08.2019	Monday

FREE

HEALTH CAMP

(For MEMBERS of the ASSOCIATION)

Organized By :-

Indian Leather Technologists' Association

In Association With

R.N. Tagore Hospital (Narayana Health)

Indian Medical Association DumDum wing

Wednesday, 17th April' 2019, (11 am to 3 pm)

Venue : ILTA Office

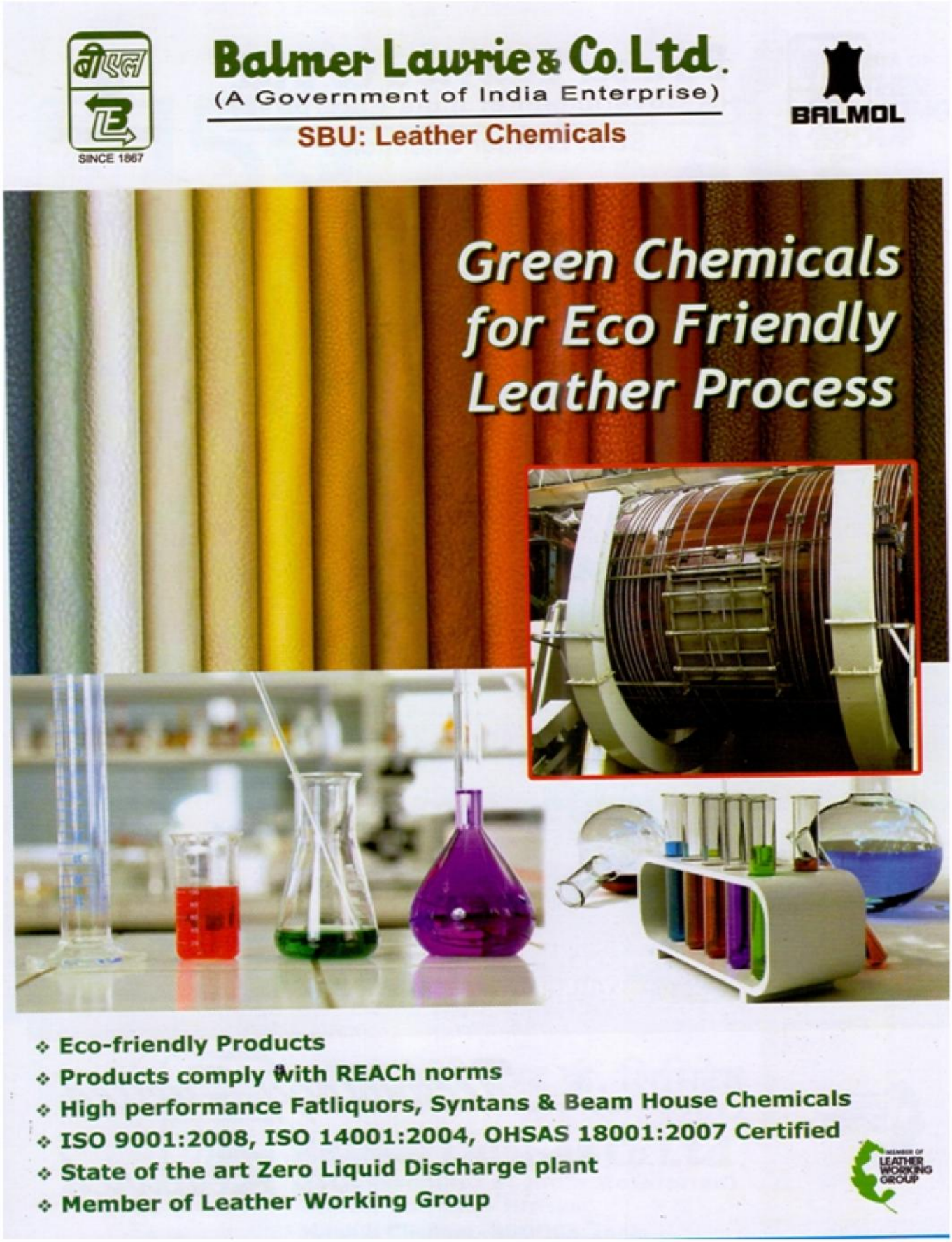
You are requested to :-

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 / 7320. 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.

(Susanta Mallick)
General Secretary

Executive Committee Members meet every Thursday at 18-30 hrs. at ILTA Office.
Members willing to participate are most welcome.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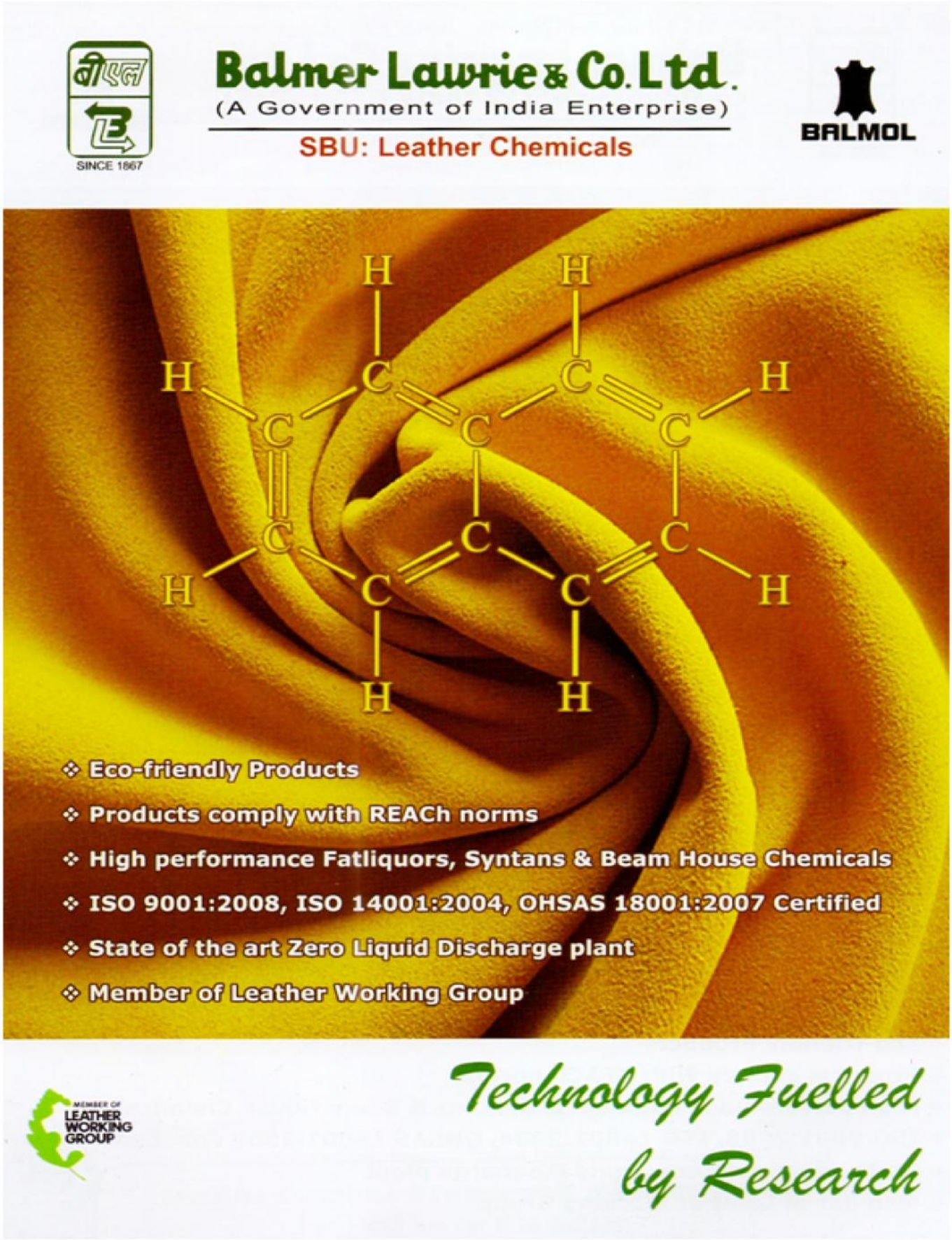
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MEMBER OF LEATHER WORKING GROUP
Technology Fuelled by Research

TECHNOLOGY HELPS FOOTWEAR INDUSTRY TO GROW

Mr. Shomenath Ganguly, Former Principal
KARNATAKA INSTITUTE OF LEATHER TECHNOLOGY
BANGALORE

In India, if we look about 50 years back, during the 60's and the 70's, we will see that our footwear industry was largely a hand-made sector. An exception was probably the lone presence of M/S Bata Shoe Company in Kolkata. Our domestic footwear industry was largely dependent on Agra, Kanpur & some other areas adjacent to Delhi for producing maximum number of shoes. Kolkata was the main hub for supply of sandals & chappals. During that time shoes were made with chrome tanned leather upper and vegetable tanned leather soles with hand-made stitching process. Those shoes were hygienic & eco- friendly. The Indian footwear scenario started changing from 1965 onwards and it's then that we could slowly start to feel the presence of technology in the market.

1. The first introduction of technology in this field was probably with **permanent adhesives** replacing stitching in footwear. At first rubber-based adhesives were used to join lasted upper with micro rubber sole, but gradually PU adhesive entered the market. Now the entire footwear industry is dependent on adhesives.

2. **Designing & Grading of Footwear Components** are an integral part of the shoe making. The indigenous process which was used previously wouldn't provide correct measurements. Grading of components is essential for the footwear industry irrespective of the size of the factory. Introduction of Computerised Designing & Grading gave an enormous boost in this sector. In computers we can now design shoes and other components. We can get the paper components through Plotter Cutter which is 100% accurate and helps to make good quality products. This enables export-oriented factories as well as domestic manufacturers to get 100% correct parts. Although most of the Indian designers still design directly on the last instead of on computer, computerized designing is being adopted worldwide. It is an advanced technology for this sector.

3. **Last making** in India was based only on hand made sector. Cutting the wooden logs by hand is a very high skilled job which was being done by our traditional artisans. Modern last making by machines using **turning method** with HDP (high density PVC) instead of wood helps to get 100% accurately measured lasts. It is not possible to get that type of precision with hand-made lasts. Machines can give us non-shrinkable & zero-defect lasts.

4. **Computerised Last Making :** Usually a last is made on turning a block of Wood / PVC block on a machine one / two at a time. Now with the help of modern **CNC milling machine** 6-8 pieces of lasts can be processed at a time. Rough & fine turning is done in minimal time and it enables more production in the line.

5. Lasts can also be produced without a turning machine in **Injection Moulded Last Making.** PU material with a special polyurethane formula with characteristics of hardness and strength fully equal to those of high-density PVC can be used. This can also be made in moulding machines. Besides these there are new softwares which can create **new models of lasts** in computer.

6. **Customised Shoe Making :** With the help of a foot scanning machine we can now get the exact measurements of the feet of a customer which (the data of measurement) can be forwarded to the modern last making factory having special software for last making from scanned data. This data can be forwarded via email or a pen drive. Lasts can be made based on those measurements of the customer. This last can then be sent

*Corresponding author E-mail : snganguly@yahoo.com

to a shoe factory which can make a pair of shoes which will fit the customer most accurately.

7. **Unit Sole Making :** With the help of newly developed 2D & 3D digitisation software it is now possible to make new designs of **Sole Mould** with the help of special software in CAD/CAM technology with zero defects. Hand-made mould can never match the same quality. This is really a big boost for the footwear industry.

8. **Creation of Double Density Sole** is one of the unique developments in the line of unit sole making. It provides cushioning effect on the feet inside your shoe and provides enough abrasion resistance on the outer side of the sole keeping the shoe durable.

9. **Vapourisation of Leather Upper** is one of the technological developments to provide softness of closed upper while lasting the shoe. It also helps in shape retention of shoe. Before this technology was in place water was used for this purpose and shoes were kept in the sunlight for a day for drying after the lasting of shoes.

10. In the production line a major development in the shoe industry is the introduction of **DIP & DVP machines**.

    Direct Injection Process (DIP) : a) PVC b) TPR c) PU

    In PU again it has a) PU DIP & b) PU POURING. With the help of these machines, both shoe and unit sole can be developed. Complete Moulded Shoes in PVC / PU materials are also being made.

    Direct Vulcanisation Process (DVP) : a) Moulded Rubber Shoe

11. **Switching to cutting components in machines** from hand cutting is also a technological development. Cutting machines usually need "Clicking Knives" to cut leather in the machine. Nowadays there are advanced cutting machines available which does not require any knife for cutting. This new type of machine is defined as **"Die Less Cutting"** or **"Continuous Cutting"** machine. In these computerised machines, components can be cut as per direction. Computerized designing programmes are to be developed first which will then cut components according to the requirements by the users.

    a) Knife Cutting - Reciprocating knife or Drag knife
    b) Water Jet Cutting.
    c) Laser Jet Cutting.

12. **Automatic Closing Machine :** Instead of stitching by indigenous sewing machines we have new computerised stitching machines developed. Components will be placed in the bed of the machine and stitching of the shoe will be programmed separately. The machine will perform the stitching as per the programme with high speed & zero defects.

13. **Robots in the footwear industry :** In the footwear industries abroad, robots are handling devices to automate the shoe manufacturing processes. The automatic roughening and cementing machines used in the making rooms also have robot like characteristics. They can be taught to memorise the programmed motions for many different styles and can cater automatically for different sizes as well as for the left and right pairs.

TANNERIES SHUT DOWN IN UP FOR KUMBH MOVE TO BENGAL

The UP government's shutdown order on leather tanneries in Kanpur and Unnao since the beginning of Kumbh three months ago to cap pollution in the Ganga, has dealt a double blow to the industry in the state. While hide buyers from Kanpur are turning to Pakistan and Bangladesh for raw material, manufacturers are moving to West Bengal.

In mid-November 2018, around 300 tanneries operating in Kanpur, Unnao and Banthar have closed down ahead of the Kumbh as the district administration felt the industry failed to ensure effluent treatment before discharge. It's another thing the UP government failed to provide any infrastructure back-up to the leather industry.

Javed Iqbal, the regional chairperson for Council for Leather Exports in Kanpur, said Bangladesh and Pakistan have gained from Kanpur's loss. "We have Rs 20,000-crore domestic business and Rs 8,000-crore export business from Kanpur. With tanneries shut for three months, the customer is not going to wait. They are procuring from Bangladesh, known for its soft leather, and Pakistan, famous for buffalo leather.

The industry in Kanpur is down to zero with no production at all in the past three months," Iqbal said. Apart from businessmen buying from neighboring countries, ancillary industries like chemical suppliers are also moving away since the demand for products has crashed in Kanpur. Hafizur Rehman, president of Small Tanneries Association, questioned the government's intent to "destroy" a well-established and world-famous industry where at another level it was talking about 'Make in India'.

For Kanpur's traders, West Bengal has become the favoured destination for many tannery operators. Attractive land rates and sops by the government to promote the already flourishing industry in the state have seen close to 40 units move out since last year. 'Businessmen are not going to wait for tanneries to open'.

A sad Iraqi, a tannery operator from Kanpur, applied for land in Kolkata's Bantala leather complex. He tried moving operations there in December, but by the time he succeeded, he already lost his orders.

"I began moving operations to Kolkata in December, but it was already too late. I have now applied for land in Bantala and will shift operations there. Our unit in Kanpur had been functional for 25 years but this decision by the government has wiped out business. It will take at least two years to get back on my feet," said Iraqi, adding whenever the government directed opening of tanneries, businessmen have no orders and therefore, no work.

"Businessmen are not going to wait for tanneries to open. If we cannot supply hides, they will move to other markets," he added.

(Source : Times of India, Kolkata)

UP TANNERIES BEGIN MOVING TO BENGAL TO SHIFT THEIR OPERATIONS

After the illogical ban by Yogi Adityanath led Uttar Pradesh government on all tanneries in the region during Kumbh, the owners of big tanneries are now are moving to Bengal to shift their operations.

As per the reports published in The Indian Express, the West Bengal government has allotted land to least 12 tanneries in Kanpur in the presence of Chief Minister Mamta Banerjee after their applications got approved.

On Friday, the second day of the Bengal Global Business Summit (BGBS), 2019 the applicants were told to collect the allotment letters. To shift their tanneries to the West Bengal, 80 industrialists from Kanpur had applied for land to the Mamta Banerjee government around four months ago.

"The letters have been issued by the Micro, Small & Medium Enterprises and Textiles Department. The West Bengal government is giving us land at the rate of Rs 2,150/sq metre in Banta la area where Kolkata's leather industry is situated," Javed Iqbal, Regional Chairman, Council for Leather Export (Central region, Kanpur), told The Indian Express.

SEALED TANNERY UNITS TO START OPERATION SOON IN UP: IIA

Agra, Mar 8 (KNN) The tannery units that were shut due to Kumbh Mela will be opened today and most probably they will start their operations again within two days as the Kumbh has come to rest, said Indian Industries Association (IIA).

Speaking to KNN India, President of IIA, Sunil Vaish said, "As many as 10-12 tannery units that were shifted to Kanpur are quite relaxed with the environment there, but the issue of pollution for which tanneries were closed in the Uttar Pradesh (UP) is a matter of concern in West Bengal also as pollution was the only reason for shutting units in UP."

He expressed his concerns for the industries that are shifted and said that they should be ready for new challenges that might occur in Kanpur due to pollution. On behalf of tanneries in Kanpur, he expressed their disappointment with the state government saying that it's UP government's fault of not providing any alternative solution for this.

He said that tanneries are the source of earning foreign currencies via exports to the state, so government should have come up with the alternative plan before closing them. Almost 400 tanneries which contribute to the major export of Kanpur were affected due to shut down for three months.

The Government of Uttar Pradesh took this step in order to provide clean water for devotees participating in the upcoming Ardh Kumbh festival.

FOOTWEAR MARKET SET TO ENTER RS 1 LAKH CRORE CLUB IN 2 YEARS

Footwear market will grow closer to Rs one lakh crore in next two years, with the highest growth rate among lifestyle products. By 2021, the branded segment will grab half of the market and this will be aided by the faster growth in both organized and online retail. In 2018, the footwear market was valued Rs 63,520 crore and it is expected to grow to Rs 95,350 crore by 2021.

At a compounded annual growth rate of 14.5 per cent, it is the fastest growing category among lifestyle products, finds RedSeer Consulting. According to RedSeer, branded footwear currently accounts for 44.5 per cent share and unbranded dominates with 55.5 per cent share. However in two years both will have an equal share of 50 per cent as branded will be growing at a CAGR of 19 per cent while unbranded segment at 11 per cent.

The branded segment growth is being aided by the faster growth of both organized retail and online retail. Organized retail with 25 per cent share of the market is expected to grow at a CAGR of 18 per cent and grab 27 per cent of the total pie. Similarly, online retail is growing by 27 per cent and is expected to increase its share from 11 per cent to 15 per cent in next two years. At a slower pace of 11 per cent, the traditional market will lose its share from 64 per cent to 58 per cent.

"Going forward the share of organized retail will further increase with expansion of the brands in smaller towns of the country and entry of new players owing to 100 per cent FDI in single brand retail. In case of online retail, standardization of product, convenience and high share of branded products is driving the growth.

Leather is a fascinating product that needs regular care to reach and maintain its optimum condition. General use causes cracking, delamination and discoloration, all of which can be prevented by proper cleaning and protection. Stahl's range of Shoe & Leather Aftercare products brings out the best of your leather items and makes them more durable at the same time.

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There is no such thing as one size fits all, so all of our solutions are available in endless and customizable variations in order to meet all your requirements. Curious what our Shoe & Leather Aftercare solutions can do for your business? Please visit www.stahl.com or contact us at **stahl.india@stahl.com**.

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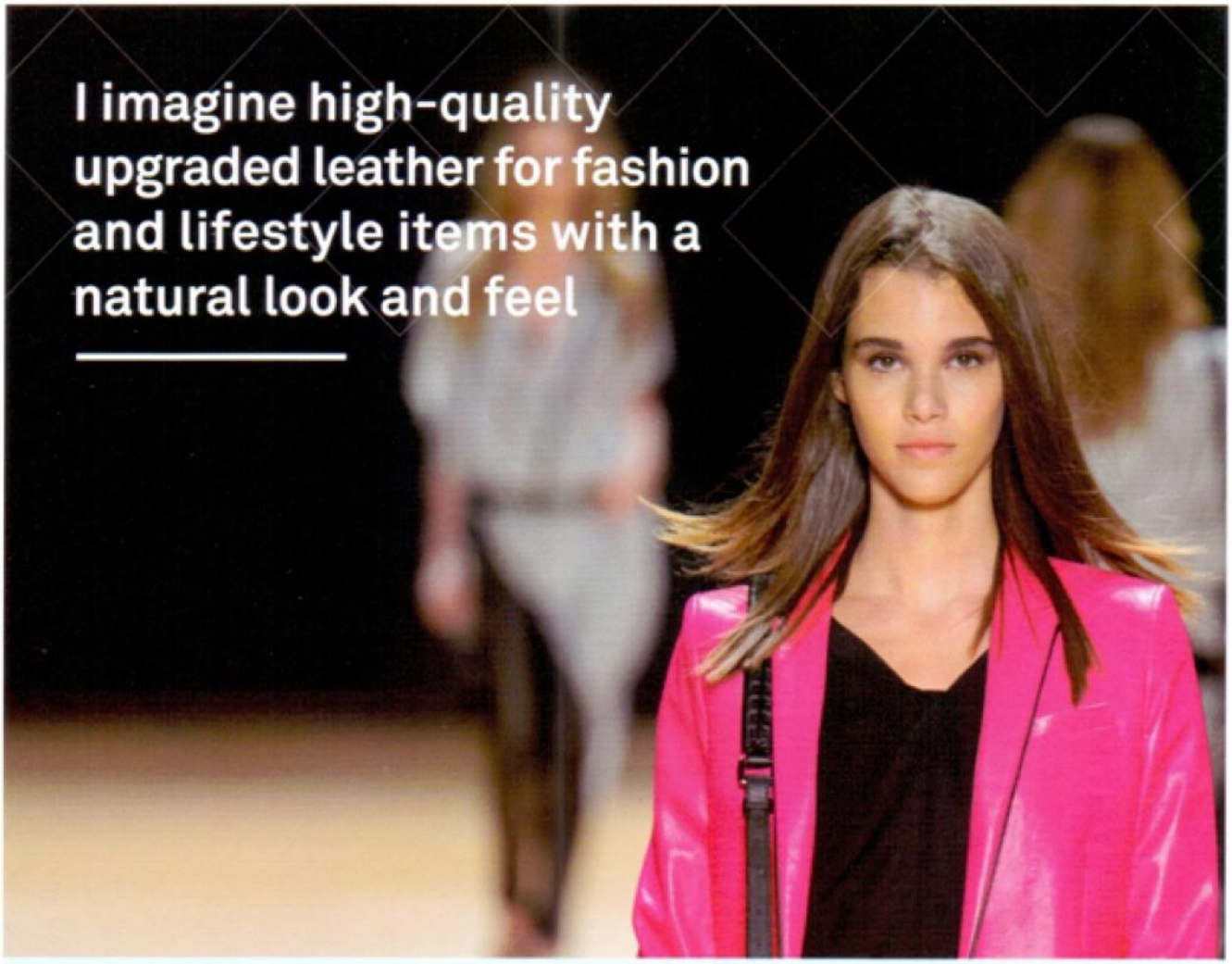

At Stahl, we love high-quality leather with a natural look and outstanding credentials. We want leather to be soft on the skin and both a pleasure to wear and to look at. To increase the availability of such leather we developed Stahl Easy-KAT: an easy-to-use, water-based leather upgrading product range for hides with small to medium grain defects.

Effective upgrading for high-quality leather

Easy-KAT enables tanners to widen their horizon by producing more leather that retains its luxurious appearance over time. Small imperfections in a hide, such as scratches and insect damage, are eliminated without affecting the suppleness, appearance or feel of the finished leather. The secret of Easy-KAT is its natural affinity to anionic substrates and great sealing and levelling power, resulting in soft and flexible leather with all its natural aspects preserved. From high gloss to matt leather – anything is possible.

Easy-KAT is suitable for any type of crust. The finished leather is perfect for high-end fashion items, such as shoes, bags, garments, and jackets. Leather items tanned with Easy-KAT are the items consumers love to wear or carry. Curious what Easy-KAT can do for your business? Please visit www.stahl.com or contact us at **stahl.india@stahl.com**.

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LESSON ON LEATHER GOODS – Part II

Shome Nath Ganguly
Former Principal of Karnataka Institute of Leather Technology

(The purpose of this article is to advise the students as well as artisans engaged in leather goods industry.)

NON TRADITIONAL LEATHER USED IN THE FOOTWEAR INDUSTRIES (PART - 5)

HORSE LEATHER

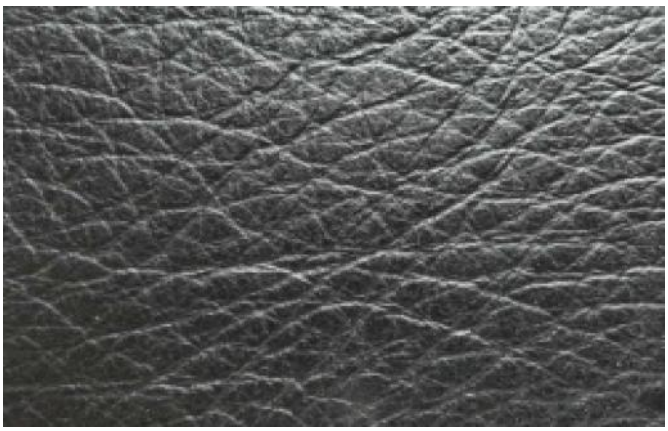
Horse leather is not easily available today. The horses in the fields were replaced by tractors and by motor vehicles as a means of transport. Due to this there is much less horse leather is available in the slaughterhouse.

There are several theories about the origin of the term Cordovan. One of them is that it is derived from a French tanner family, which specialised in horse leather processing in a village of the same name. Other sources report that the Spanish city of Córdoba had already been a centre of leather production during the time of the Moors. In Germany, the term "Korduan" is used occasionally. The term Cordovan is common in English and Spanish.

Shell cordovan (or cordovan) is a type of leather commonly used in high-end shoemaking. Cordovan is an unique leather made from the fibrous flat muscle (or shell) on the rump of the horse. It is a difficult and expensive leather to make. In the late 19th and early 20th century this leather was mostly used for "Razor Strops" to sharpen razors in barber shops. More recently it has been increasingly used for shoes, wallets, and watch straps due to its aesthetic qualities and exceptional durability.

Horse hide is measured from the root of the tail 18 inches forward on the backbone. The hide is cut at right angles to the backbone and the resulting pieces termed a "front" (the forward part) and the "butt". The term cordovan leather applies to the product of both the tanned fronts and tanned butts. After being tanned, leather from the "front" is typically used in the fabrication of gloves, or making uppers of shoes. The "butt", after tanning, is passed through a splitting-machine to get its required thickness.

What is termed the "shell". The close fibers of the shell result in a smooth and pliable leather used almost exclusively in the manufacture of shoes and watch straps, although another use is for the manufacture of finger protection tabs for archery, where it is prized for its toughness, longevity, and protective qualities.

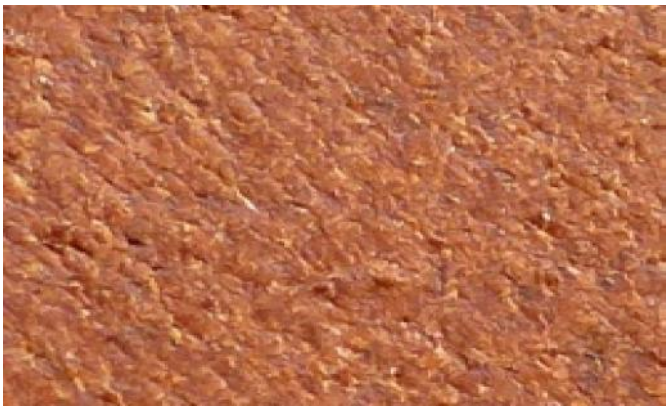


Pigmented horse leather is hardly distinguishable from bovine leather.

Cordovan is one of the very expensive leathers, especially as the demand clearly exceeds the supply. Suitable horse skins are very rare, since heavy work horses are also very rare and cannot be replaced by horses from breeding or sporting activities. Cordovan leather has its roots in the United States, where its manufacturing process has been used for Men's shoes made of Cordovan. American shoemakers perfected the process over the years while shoes made of this leather have been less frequent in Europe.

The production time of Cordovan leather in the vegetable tanning process and the other production steps will take longer time. A special feature of Cordovan leather is its fine gloss which is produced by glazing at the end of the production process. Shoes from Cordovan leather have a very long life span if the production quality was good and if they are treated well.

Leather is very smooth and shiny at the end. There is no noticeable roughness. Only under the microscope you can see the back of the leather surface, but the leather is stretchy and comfortable.



The gloss of the Cordovan leather under the microscope as the back (flesh side) of the leather. Under the microscope, the prominent pore structure of horse leather can be observed.

Horse leather shoes with grain side to the top.

Important: Cordovan cannot be cleaned with moisture. Wet cleaning makes the glazed fibres swell and they immediately become very dull and rough. Therefore, only clean the dust off with a dry brush or cloth.

Leather jackets made of horse leather

In addition to the use for shoes, horse leather is also processed into jackets. Horse leather jackets have special characteristics. They are usually heavier and stiffer than other leather clothing. It is heavily oiled or greased during the production of the horse leather. The surface of the leather jackets is smooth and without a notable grain structure. The leather becomes softer over time with use and gets a characteristic patina. But there are also very soft horse leather jackets. Some companies are producing horse leather jackets where the leather is softened by a special washing process.

What is different about horse hide compared to cowhide ?

Naturally, horse hide leather is made from the hide of a horse. Horses are being (by and large) much more athletic than cows & are more heavily muscled. Their skin is going to be a bit tougher than some cowhides, such as steer (the most common leather), heifer or calfskin. Bull hide is similarly tougher than the previously mentioned cowhides, sharing many qualities with horse leather. A lot of horse hide leather is from the front quarters and the back, as the rear quarters are often best suited for heavier applications such as shoemaking. For instance, Cordovan leather shoes are a very popular fashion item made from horse hide.

Advantages To Horse Hide

Horse hide leather isn't necessarily stronger than cowhide; both are strong, durable leathers and are perfectly suited to working

applications. Horse hide, though is often more rigid than cowhide, making for a longer break-in. Horse leather also has a coarse grain than cowhide and many feel it has a brighter & more shiny appearance. Horse hide is also less porous than cowhide, so dyed horse leather tends to appear less uniform in colour than cowhide. Some might think this makes horse leather impervious to water, but it isn't. Horse leather, though, will require somewhat less care than cowhide in some cases, so less regular applications of leather care products. However, fine leather is fine leather, so make sure to observe proper leather care if you buy any horse leather product. It's really down to personal preference. Some find horse leather more attractive than cowhide leather, and some don't. Would a horse hide gun belt be better than a cowhide leather gun belt? It might be a bit stiffer (and not by a lot) but either horse or cowhide belts are going to be stronger than belts made from exotic leathers such as crocodile, lizard or ostrich. Additionally, construction makes a large difference. A single-ply belt is by nature less rigid than a two-ply belt what animal the leather was sourced from is not going to matter as much. A reinforced gun belt is going to be stronger still, regardless of what kind of leather is used.

ENZYMES

Mr. Dinker Bajpai, Leather Technologist

BUREAU VERITAS CONSUMER PRODUCTS SERVICES INDIA PRIVATE LIMITED

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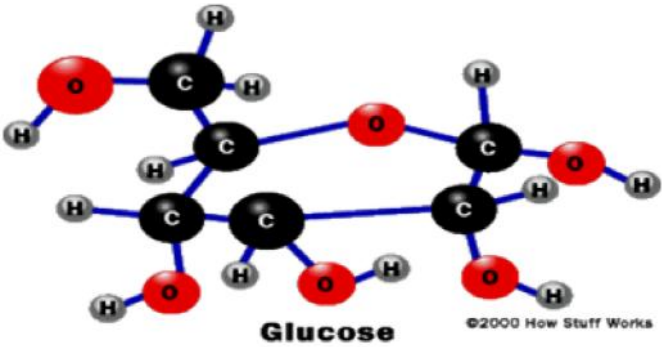
At any given moment, all of the work being done inside any cell is being done by enzymes. If you understand enzymes, you understand cells. A bacterium like E. coli has about 1,000 different types of enzymes floating around in the cytoplasm at any given time. Enzymes have extremely interesting properties that make them little chemical-reaction machines. The purpose of an enzyme in a cell is to allow the cell to carry out chemical reactions very quickly. These reactions allow the cell to build things or take things apart as needed. This is how a cell grows and reproduces. At the most basic level, a cell is really a little bag full of chemical reactions that are made possible by enzymes!

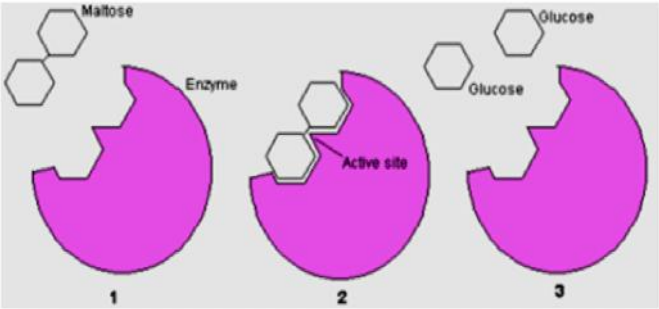
Enzymes are made from amino acids, and they are proteins. When an enzyme is formed, it is made by stringing together between 100 and 1,000 amino acids in a very specific and unique order. The chain of amino acids then folds into a unique shape. That shape allows the enzyme to carry out specific chemical reactions — an enzyme acts as a very efficient catalyst for a specific chemical reaction. The enzyme speeds that reaction up tremendously.

For example, the sugar maltose is made from two glucose molecules bonded together. The enzyme maltase is shaped in such a way that it can break the bond and free the two glucose pieces. The only thing maltase can do is break maltose molecules, but it can do that very rapidly and efficiently. Other types of enzymes can put atoms and molecules together. Breaking molecules apart and putting molecules together is what enzymes do, and there is a specific enzyme for each chemical reaction needed to make the cell work properly.

Maltose is made of two glucose molecules bonded together (1). The maltase enzyme is a protein that is perfectly shaped to accept a maltose molecule and break the bond (2). The two glucose molecules are released (3). A single maltase enzyme can break in excess of 1,000 maltose bonds per second, and will only accept maltose molecules.



The chemical structure of glucose



You can see in the diagram above the basic action of an enzyme. A maltose molecule floats near and is captured at a specific site on the maltase enzyme. The **active site** on the enzyme breaks the bond, and then the two glucose molecules float away. You may have heard of people who are **lactose intolerant**, or you may suffer from this problem yourself. The problem arises because the sugar in milk — lactose — does not get broken into its glucose components. Therefore, it cannot be digested. The intestinal cells of lactose-intolerant people do not produce **lactase**, the enzyme needed to break down lactose. This problem shows how the lack of just one enzyme in the human body can lead to problems. A person who is lactose intolerant can swallow a drop of lactase prior to drinking milk and the

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problem is solved. Many enzyme deficiencies are not nearly so easy to fix.

Inside a bacterium there are about 1,000 types of enzymes (lactase being one of them). All of the enzymes float freely in the cytoplasm waiting for the chemical they recognize to float by. There are hundreds or millions of copies of each different type of enzyme, depending on how important a reaction is to a cell and how often the reaction is needed. These enzymes do everything from breaking glucose down for energy to building cell walls, constructing new enzymes and allowing the cell to reproduce. Enzymes do all of the work inside cells.

Making Enzymes

As long as a cell's membrane is intact and it is making all of the enzymes it needs to function properly, the cell is **alive**. The enzymes it needs to function properly allow the cell to create energy from glucose, construct the pieces that make up its cell wall, reproduce and, of course, produce new enzymes. So where do all of these enzymes come from? And how does the cell produce them when it needs them? If a cell is just a collection of enzymes causing chemical reactions that make the cell do what it does, then how can a set of chemical reactions create the enzymes it needs, and how can the cell reproduce? Where does the miracle of life come from?

The answer to these questions lies in the **DNA**, or deoxyribonucleic acid. You have certainly heard of DNA, **chromosomes** and **genes**. DNA guides the cell in its production of new enzymes.

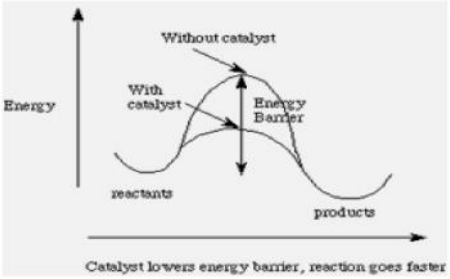
The DNA in a cell is really just a pattern made up of four different parts, called **nucleotides** or **bases**. Imagine a set of blocks that has only four different shapes, or an alphabet that has only four different letters. DNA is a long string of blocks or letters. In an E. coli cell, the DNA pattern is about 4 million blocks long. If you were to stretch out this single stand of DNA, it would be 1.36 mm long — pretty long considering the bacteria itself is 1,000 times smaller. In bacteria, the DNA strand is like a wadded-up ball of string. Imagine taking 1,000 feet (300 meters) of incredibly thin thread and wadding it up — you could easily hold it in your hand. [A human's DNA is about 3 billion blocks long, or almost 1,000 times longer than an E. coli's. Human DNA is so long that the wadded-up approach does not work. Instead, human DNA is tightly wrapped into 23 structures called **chromosomes** to pack it more tightly and fit it inside a cell.]

The amazing thing about DNA is this: DNA is nothing more than a pattern that tells the cell how to make its proteins! That is all that DNA does. The 4 million bases in an E. coli cell's DNA tell the cell how to make the 1,000 or so enzymes that an E. coli cell needs to live its life. A **gene** is simply a section of DNA that acts as a template to form an enzyme.

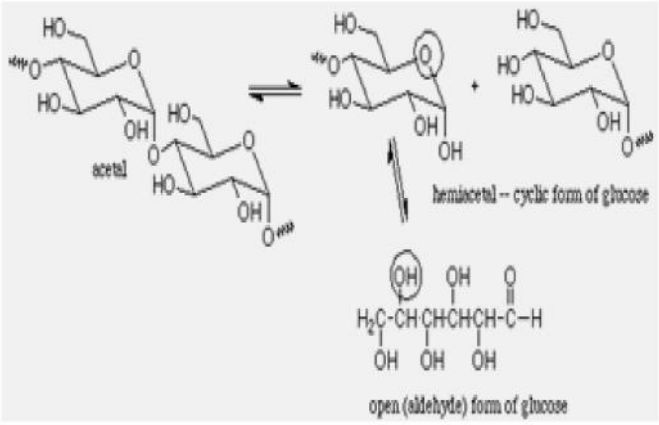
Top-level EC numbers[4]			
Group	Reaction catalyzed	Typical reaction	Enzyme example(s) with trivial name
EC 1 Oxidoreductases	To catalyze oxidation/reduction reactions; transfer of H and O atoms or electrons from one substance to another	AH + B → A + BH (reduced) A + O → AO (oxidized)	Dehydrogenase, oxidase
EC 2 Transferases	Transfer of a functional group from one substance to another. The group may be methyl-, acyl-, amino- or phosphate group	AB + C → A + BC	Transaminase, kinase
EC 3 Hydrolases	Formation of two products from a substrate by hydrolysis	AB + H_2O → AOH + BH	Lipase, amylase, peptidase
EC 4 Lyases	Non-hydrolytic addition or removal of groups from substrates. C-C, C-N, C-O or C-S bonds may be cleaved	RCOCOOH → RCOH + CO_2 or [X-A-B-Y] → [A–B + X-Y]	Decarboxylase
EC 5 Isomerases	Intramolecule rearrangement, i.e. isomerization changes within a single molecule	AB → BA	Isomerase, mutase
EC 6 Ligases	Join together two molecules by synthesis of new C-O, C-S, C-N or C-C bonds with simultaneous breakdown of ATP	X + Y+ ATP → XY + ADP + Pi	Synthetase

Enzymes are the catalysts which make possible biochemical reactions. Consider that bichemistry takes place at about 37 degrees C in water and contrast that to typical reaction conditions in organic chemistry. For example, to hydrolyze (saponify) fats we boil them with concentrated sodium hydroxide solution for a few hours. Enzymes called lipases do the same thing at body temperature in minutes. Without enzymes, our body chemistry would not occur, and life would not exist. This illustrates the impressive power of enzymes as catalysts.

Remember that catalysts increase the rate of a reaction, but are not themselves consumed or produced by the reaction. Also, they do not change the equilibrium constant of a reaction. This means that any catalyst which catalyzes a reaction in one direction (e.g., esterification) also catalyzes the reverse (e.g., ester hydrolysis) reaction. To say these things another way, catalysts do not change the energy balance between reactants and products; catalysts do lower the energy barrier between reactants and products. These statements are true of enzymes as well as other types of catalysts.



Enzymes differ from simple catalysts another very important way. Enzymes are much more specific. Sulfuric acid as a source of H^+ will catalyze the formation of any ester from the appropriate alcohol and carboxylic acid, but many enzymes are so specialized that they will catalyze a reaction of one molecule, but will leave untouched a very similar molecule. Amylase, a digestive enzyme, will hydrolyze starch, but not cellulose. Both molecules are polymers of glucose. They differ in the orientation of one bond at the junction of glucose units. Other enzymes can work effectively on a broader range of substrates (the molecule whose reaction is being catalyzed.



This broader specificity is useful in the case of an enzyme like papain which is important in protein digestion. It can catalyze the hydrolysis of peptide (amide) bonds in a variety of proteins, which means that the body does not need to maintain a stock of more specific enzymes to tackle specific proteins.

As always, we will expect to find explanations for these enzyme characteristics in the structure of enzymes. The first thing to notice is that enzymes are almost all proteins. They are often globular proteins. Thus we can describe them in terms of their primary, secondary, tertiary, and in many cases, quaternary structure. They are long chains of amino acid units held together by peptide bonds, looped and folded into secondary and tertiary (and often quaternary) structures by disulfide bonds, hydrophobic interactions, and salt bridges. In addition, active enzymes usually involve "cofactors." These are small molecules (sometimes inorganic ions) which are needed complete the catalytically active structure of the enzyme. In such instances, the enzyme without the cofactor is called an apoenzyme, and the apoenzyme-cofactor complex is called a holoenzyme. We will see that the protein chain of an apoenzyme can have functional groups on its side chains (R groups) which are important to its catalytic function, but other important functional groups are introduced by way of cofactors.

Enzymes are classified according to the reactions they catalyze. In some cases, the terms used are fairly clear; in others, less so. Examples :

Oxidoreductases :

These are enzymes which catalyze the reduction or oxidation of a molecule. Remember that oxidation is the reverse of reduction and that an enzyme has to catalyze the forward and reverse reactions to the same degree. Any enzyme which catalyzes a reduction has to also catalyze the reverse (oxidation) reaction, thus the double-barreled name "oxidoreductase."

Transferases:

These enzymes catalyze the transfer of a group of atoms from one molecule to another. A common example involves transfer of a phosphate between ATP and a sugar molecule.

Hydrolases :

As the name suggests, these enzymes catalyze hydrolysis reactions (and their reverse reactions). The hydrolysis of an ester would be an example of such a reaction.

Isomerases:

These enzymes catalyze the conversion of a molecule into an isomer. The cis-trans interconversion of maleate and fumarate is an example.

Lyases:

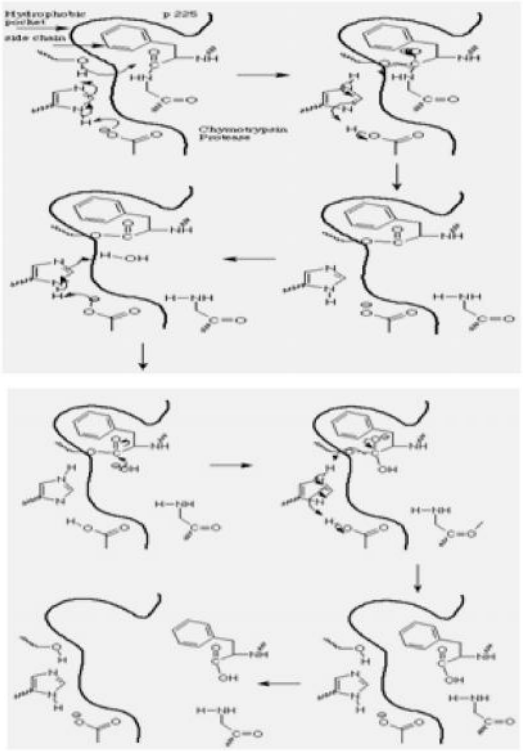
Reactions which add a small molecule such as water or ammonia to a double bond (and the reverse, elimination, reactions) are catalyzed by lyases.

Ligases:

These enzymes catalyze reactions which make bonds to join together (ligate) smaller molecules to make larger ones.

Each of these classes has more specific subclasses as well. The key to using this classification scheme is to look at the reaction the enzyme catalyzes, decide which type of reaction it is, and apply the appropriate name. Specific enzyme names are systematically derived by specifiying the substrate (the molecule

being acted upon — the reactant), the type of reaction, and appending the suffix ase. Alcohol dehydrogenase thus is an enzyme which acts on an alcohol and takes hydrogen (oxidizes) from it: it is therefore classified as an oxidoreductase. We can tell a lot about what an enzyme does from its name. Catalytic power and specificity are the two characteristics of enzymes which require explanation. The structure of the enzyme's active site [the part of the enzyme's structure where the substrate, the enzyme's functional groups and the cofactor (if any) come together] will provide us with the beginnings of an explanation. Since a catalyst must come in contact with the substrate to initiate any reaction, there must be a fit between the substrate and the active site. Right away, some substrate molecules will fit and others will not, so some substrates will react and others will not. This is specificity. The fit can come about either because the molecule fits easily into the enzyme's active site (lock-and-key model) or because the enzyme's structure adjusts to the substrate's entry (induced fit model). How does catalysis occur, or, what reduces the energy barrier for reaction. Let's keep in mind that making bonds lowers the energy of a molecule, and breaking bonds raises it. Since reactions involve both bond breaking and bond making, a reaction's energy barrier is reduced if, in each step, the energy required to break one bond is supplied by making another. Let's illustrate this idea by tracing through the mechanism of a well studied reaction, the hydrolysis of a peptide bond by the enzyme.



Enzymes for Leather Industry

In leather industry, the hides & skin have to be free from fat & protein to have better tanning effect. Here industrial enzymes like proteases are used for clearing proteins and lipases for fat removal. Today proteases are basically used for soaking, bating and enzyme assisted un-hairing & Lipases for dissolving & removal fat.

Bating

An enzymatic process by which scud is loosened and other unwanted proteins are removed. It makes the grain surface of the finished leather clean, smooth and fine and cannot be replaced by any chemical process.

The conventional way for bating employed manure of dog, pigeon or hen. But it was slow methods and unpleasant, unreliable one. That is why many progressive industrialists preferred to replace with this method with use of industrial enzymes.

Soaking

Soaking is 1 st stage of leather processing. dirt, blood, flesh, grease, dung etc are washed way and most importantly, re-hydrates the skin /hides to bring as far as possible back to state of green one from the Hides and skins received into a tannery. It is very important for all types of skin hides (as green or fresh, as wet salted, as dry salted or as dried) to produce qualitative leather. There are three types of agents like Chemical, Surface-active and Enzymatic agents for this purpose.

Enzymatic agents are biocatalyst. Specific protease and lipase enzymes enhance water uptake by dissolving intrafibrillary proteins that cement fibers together and disperse fats and oils together with dirt and other contaminants present on skin.

Un-hairing

Generally Hair burning process using lime and sodium sulphide are used for hair removal from bovine hides. It dissolve the hair and open up the fiber structure.

Most importantly, enzyme-assisted un-hairing results in a cleaner grain surface and improved area yield and softness. Here Jagson

produces specific proteases for tanneries .this gives to the tanneries a number of options. like the tanneries can opt to reduce the consumption of i, the sulphide and lime up to 40% of their requirements while maintaining the same liming time. Or they can shorten the liming time by at least half without hampering quality. Or to avoid the use of amines, which can be converted into carcinogenic compounds.

Though The hair-burning process is used worldwide but hair-saving process (the hair is not dissolved but can be filtered out from the liming float) can be a better alternative.

Eco- friendly, reduce the COD up to 50% and BOD up to 30% in waste water.

Degreasing

Lipases are a type of enzyme that hydrolyse fat outside and inside of the hides and skins structure in such a way so that the leather con no t be damaged. Once most of the natural fat has been removed, subsequent chemical treatments such as tanning, re-tanning and dyeing have a better effect.

The key factors of using lipases are :

- ü Uniform colour and a cleaner appearance.
- ü Improve the production of hydrophobic (waterproof) leather;
- ü Makers of leather for car upholstery have commented that 'fogging' is reduced. This is the term for the build-up of a film of chemicals on the inside of car windscreens.
- ü Ecofrindly system for removal of fat.
- ü For bovine hides, lipases allow tensides to be replaced completely. For sheepskins containing up to 40% fat, the use of solvents is very common and these can also be replaced with lipases and surfactants. Solvents tend to dry out the skin and give it a pale colour. If surfactants are used for sheepskins, they are usually not as effective and may be harmful to the environment. Stronger surfactants such as nonyl phenol ethoxylate have a better effect but they are more detrimental to the environment. When using Jason's lipases, the original surfactant dosage can be reduced by at least 50% in the case of both sheepskins and pigskins. In addition, nonyl phenol ethoxylate can be substituted with more biodegradable surfactants.

LEATHER (COLLAGEN) FIBER CONTENT

Labs determine the percentage of leather fiber (hide or collagen fiber) in bonded leather (or genuine leather) according to ASTM D 2868, Standard Test Method for Nitrogen Content and Hide Substance Content of Leather.

The sample is digested with acid in the presence of a catalyst to convert the nitrogen to the ammonium ion, which is non-volatile under the highly acidic conditions. The acid mixture is then made alkaline, and the liberated ammonia distilled into boric acid solution, which absorbs the ammonia. Finally, the amount of ammonia in the boric acid is determined by back titration, giving the nitrogen and hide substance (protein fiber) content.

INDIAN LEATHER PRODUCTS ASSOCIATION

The Indian Leather Products Association (ILPA), established in 1987, is a premiere representative body of manufacturer-exporters of superior quality leather and leather products with head office in Kolkata and a regional office in Chennai.

IMPORTANT ACTIVITIES OF ILPA :

- Brings together manufacturer & merchant exporters on a common platform.
- Stimulates growth & development of the industry as a whole.
- Promotes export of leather & leather products.
- Develops & maintains symbiotic liaison with international trade bodies & Chambers of Commerce.
- Organises trade delegations to international fairs & seminars.
- Organises various Seminars/workshops both the benefit of its members and industry.
- Promotes International Fairs and RBSMs like IILF Kolkata, ILPA Buyer Seller Summit.
- Organises the ILPA SHOW : Leather on the Ramp , one of the most prestigious and sought after Fashion event in Eastern India.
- Closely involved in setting up the Calcutta Leather Complex(CLC).
- Runs and manages the Freya Design Studio : a CLE award winning Design Studio both for leather goods and footwear.
- Runs and manages the ILPA INFRASTRUCTURE DEVELOPMENT FOUNDATION (IIDF) – a state of the art Common Facility Centre.
- Imparts Skill Development Training through ILPA Technical School.

Common Facility Center

Design Studio

CAD CAM Center

ILPA Technical School

Indian Leather Products Association
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Mobile: +91 7605855567 / +91 9007881474
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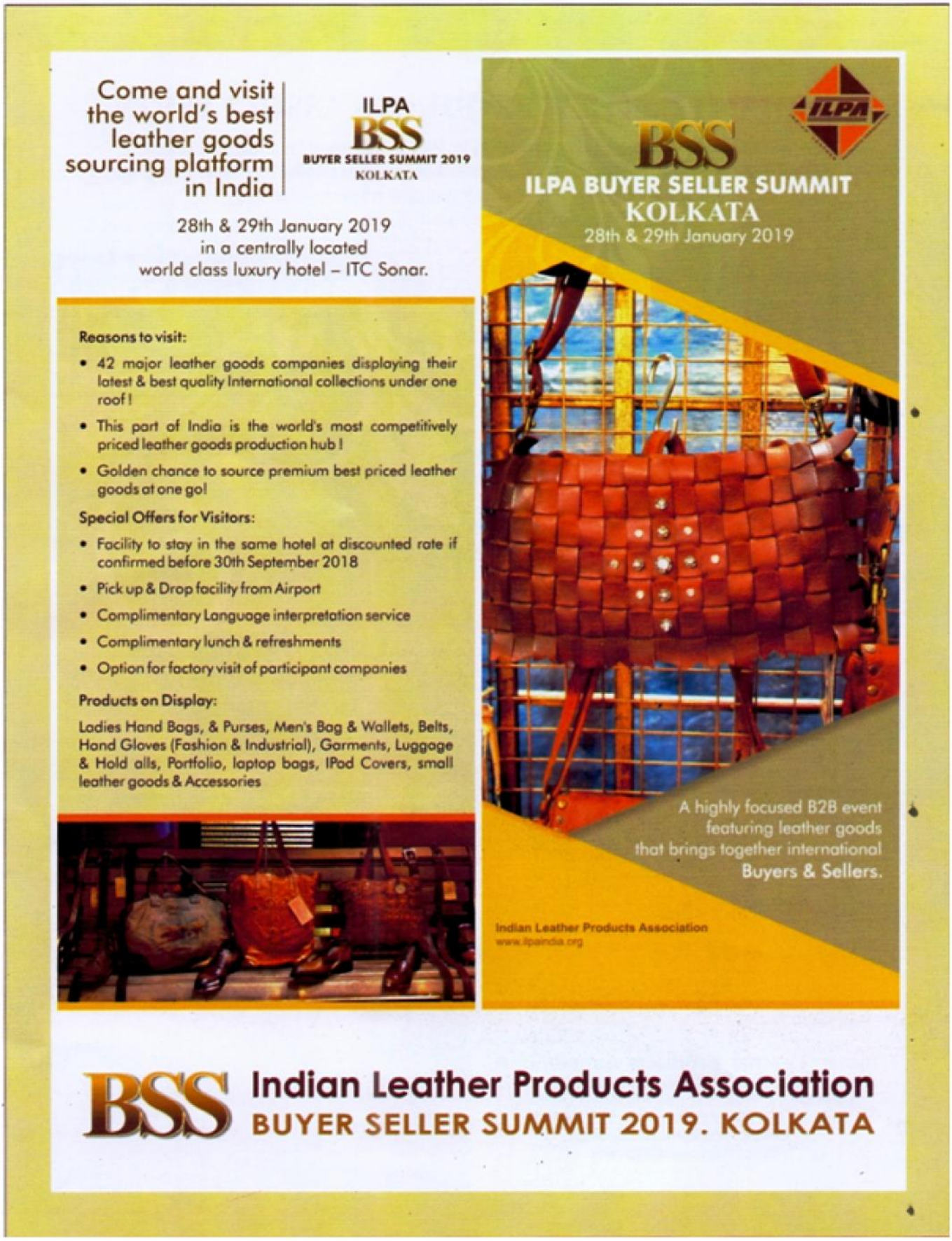
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ILPA
BSS
BUYER SELLER SUMMIT 2019
KOLKATA
28th & 29th January 2019
in a centrally located
world class luxury hotel – ITC Sonar.
Reasons to visit:
• 42 major leather goods companies displaying their latest & best quality International collections under one roof!
• This part of India is the world's most competitively priced leather goods production hub!
• Golden chance to source premium best priced leather goods at one go!
Special Offers for Visitors:
• Facility to stay in the same hotel at discounted rate if confirmed before 30th September 2018
• Pick up & Drop facility from Airport
• Complimentary Language interpretation service
• Complimentary lunch & refreshments
• Option for factory visit of participant companies
Products on Display:
Ladies Hand Bags, & Purses, Men's Bag & Wallets, Belts, Hand Gloves (Fashion & Industrial), Garments, Luggage & Hold alls, Portfolio, laptop bags, IPod Covers, small leather goods & Accessories
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B. M. DAS MEMORIAL LECTURE*

INTERACTION OF PHENOLIC TANNINS WITH COLLAGEN

Prof. Kuntzel

In all cultured countries, the memory of great men of science is honoured, the greatness of these men consisting in their having carried out pioneer work. The characteristics of pioneer work in science are originality of ideas and fruitfulness in the subsequent generations. In the field of leather science, Prof. H. R. Procter in Leeds was a great man. It was he who dealing with the technical problems of the tanner tried to transform it from an empirical to an exact science.

Very often, great men are characterised by the fact also that they attract students who continue the work of their teacher and master. Two of the most important of Procter's students are J. A. Wilson in U. S. A. and B. M. Das in India. The British Leather scientists keep alive the memory of their H. R. Procter by inviting scientists, who are working in the footsteps of Procter to report on their own studies and results of work. It is a privilege of the American and Indian tanners also to remember in the same manner their men who have in their respective countries transplanted the Procterian spirit and have thereby carried out pioneer work.

Feeling it as a special honour and distinction to be requested for the 2nd B. M. Das Memorial Lecture, I have readily acceded to this request although only a restricted opportunity was given to me to see and speak to Professor Das. This occasion came in 1944 when Prof. Das, as a tenchnical investigator, came to the completely shattered Germany along with the team of British and American investigators, to ask with the right of a conqueror for information about technical processes and manufacturing secrets.

In a greatly exaggerated evaluation of my scientific work, Prof. Das and other investigators of different conquering countries also came to my institute brought to ruins by the war, on purpose to interrogate me on my work. This meeting between Das and me, which was short and for my part hardly productive therefore took place under auspices not quite favourable. For at this time, it was still mars, the god of war, who governed the climate of such investigations. However, the meeting left on me a lasting impression of this strong personality—the impression of man of high intelligence of commonsense and objectivity.

Though the prevailing circumstances made it impossible, that anything like human warmth between Das and myself could arise in this interrogation, nevertheless I feel myself to be connected humanly with Prof. Das in another way. At the time of his studies in Leeds, Prof. Das was co-worker of E. Stiasny. I myself became a collaborator of Stiasny at a later period when he was teaching in Darmstadt. The veneration for the Grand Old Man of leather science, who on his part had been for 5 years a close coworker of Procter, binds together Prof. Das and me.

In our country, it is customary to designate as "Doctor Father" the Professor, who helps young students to the proud title of a Dr. rev. nat. or Dr. Ing. Stiasny was Doctor Father to B. M. Das and I too found in Stiasny a paternal sponsor, friend and adviser, even if he was not my Doctor Father in the exact sense. So there is a kind of fraternal bond which has given me the right to deliver a lecture dedicated to his memory.

The interaction between collagen fibre network of the hide and the tannin molecules in aqueous solutions of tanning extracts has two aspects—chemical and physical.

The chemist who grapples with the problems of leather manufacture has a tendency to consider the chemical aspect as the most important on account of his education as a chemist. The ultimate goal of his investigations is to be able one day to build up a model of the tanned hide fibre from many coloured balls and connecting wires. In this model, the multicoloured balls would embody the atoms of hide protein and the atoms of the tannin molecules, while the connecting wires would symbolise the forces, which hold together the atoms within and between the two components of leather fibres. To day, we are still far off from such ideal models of the atomic structure of leather fibre and it is hardly likely that this model with claim of a true picture will be ever built up ; models of certain protein bodies of smaller molecular weight, that is blood protein, are already existing.

It can be assumed with certainity, be that as it may, that such a model will be completely valueless for the leather technologist. It will not help him in any way in solving his technical problems just as the mason (or architect) who raises a structure with stone, wood, cement, glass and iron does not know and does not need to know anything about the atomic structure of his building material. Moreover, even for fundamental investigation, building up such an atomic model of leather fibres would prove to be an unfruitful and indeed a wrong proposition. For while there is only one type of collagen (apart from the unimportant variations), there exist as regards the tanning materials extraordinarily numerous and very much different substances with which is attained the technical objective to transform the unhaired animal hide into leather.

There is, therefore, no single chemical reaction which leads to tanning ; there are obviously numerous possibilities for carrying out tanning reactions. But can we speak of tanning reactions at all in the sense of chemical reactions, when it is possible to transform the hide into a leather-like material, only by treating it with acetone, without a real tanning material ? Also by freezing out the water present in the hide and by subsequent evaporation of ice crystal in high vacuum, it has been possible to obtain a leather-like dry product and showing after an impregnation with silicon oil, all qualities of real leather.

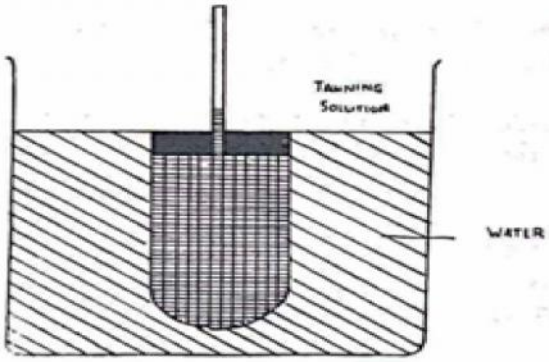
It follows from the aforesaid that the generally posed question about the dependency of the tanning effect on the structure of a tannin is completely wrong.

The same question gains some more sense, if we apply it to the field of vegetable tannins, that is, to the plant polyphenols only. Even in this case, only answers which would be very general and sound nonspecific can be given answers which are relevant for all phenols and for nontanning phenols too. An example would be the well known theory that there occur hydrogen bridges between phenolic hydroxy groups and the peptide groups of proteins, by means of which the phenolic substance is fixed on or in the hide substance. Now, there exist various specific studies going further, on the relation between constitution and tanning action ; however, it appears to me to be worthwhile to conclude this chapter here and discuss the following question :

How far during the vegetable tanning process does a penetration of the tannin molecules into the hide fibre occur, that is, a deposition of tannin molecules between the collagen molecules in the molecular lattice of collagen ? With this, we come to the physical aspect of vegetable tanning.

The most important essentially physical effect, which occurs in tanning with vegetable extracts, is the osmotic dehydration of the hide or of the hide fibre. This connotes a phenomenon which always takes place, if tannin solutions of high concentration act upon the untanned, unpretanned hide. In extreme cases, the osmotic effect causes a cessation of tanning—case hardening. Case hardening signifies that the middle layer of hide is so thoroughly dehydrated that the tannin molecules cannot penetrate into this zone. This middle layer is in the same way impermeable by tannins as dried and insufficiently resoaked hide is.

Actually the practical technologists consider case hardening as a retardation of tannin diffusion, by the pores getting blocked and connect it with too large a size of the tannin molecule and the like. Certainly case hardening is concerned with a retardation of tannin diffusion. But it is brought about not by oversized tannins blocking pores but by the fact that the tannin solution extracts water from the hide quicker than the tannin penetrates into the hide.



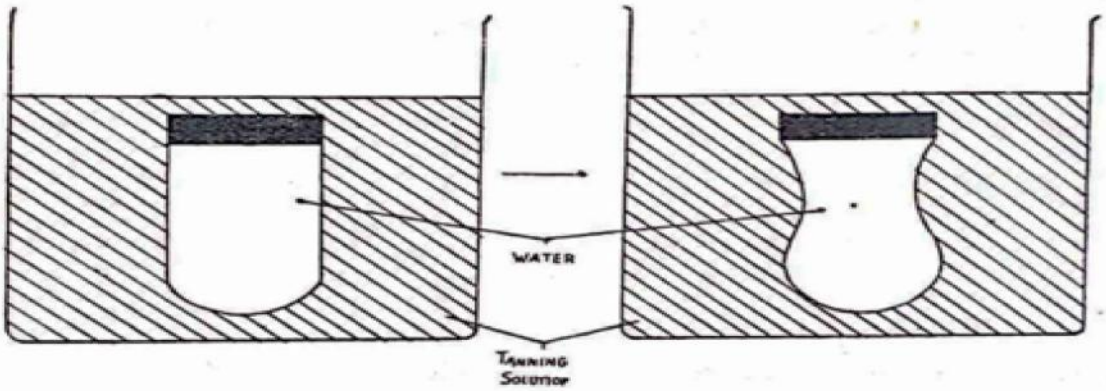
This removal of water is a typical osmotic effect which takes place also when a wet hide is put into a sugar or salt solution of high concentration. Such solu-

tions are strongly hygroscopic ; they have the tendency to take up water and they extract water even from a hide, which is put in these solutions.

The effect is called 'Osmotic' because it can be demonstrated in an ideal manner by the well-known osmotic cell of the botanist Pfeffer. This osmotic cell is formed by a membrane which allows water to pass through but not tannin molecules.

Because of its tendency to become dilute, the tannin solution draws in water through the membrane ; this results in a rise of the liquid level in the tube leading out from the cell. It is possible to reverse the distribution of liquids inside and outside the osmotic cell. We fill up the osmotic cell with water and put the completely closed cell in a strong solution of vegetable tannins. In this case also the tannin solution attracts water. The consequence of this is the cell wall, made of pliable material, e.g., parchment or cellophane, collapses due to the decreased volume of water.

Osmotic experiments with tube-form gelatine gels show very clearly what is happening in the osmotic dehydration of hide.



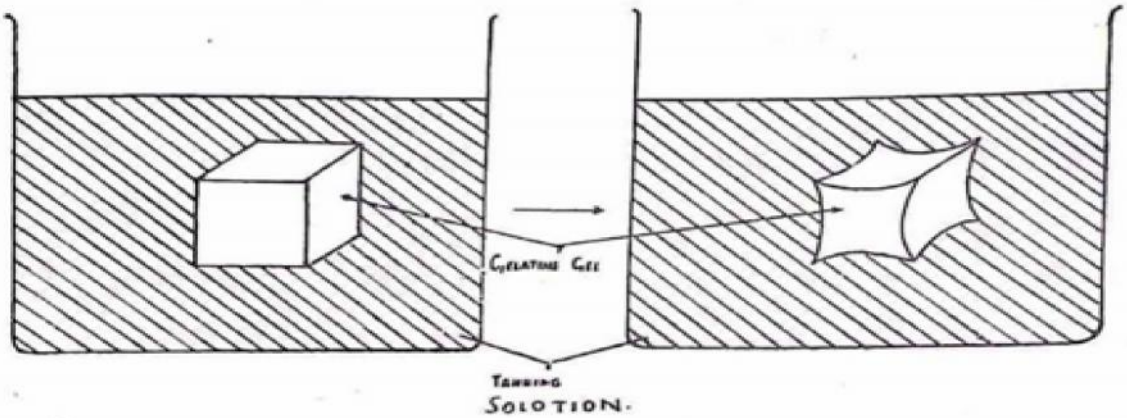
If such gels are put into tannin solutions, then they shrink like the water filled osmotic cells under the influence of the tannin solution.

We will now consider the system hide-tannin solution, after the preparatory considerations on osmotic cells and gelatine cubes.

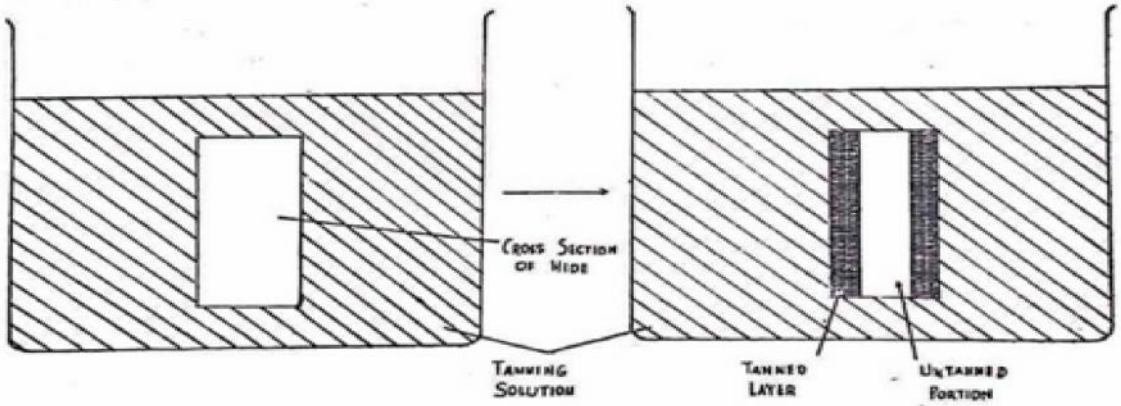
If a piece of a rather thick hide is put into a tannin solution of suffiicently high concentration then after some time the tannin process comes to a stationary state. If the hide piece is now cut through, then the cut section shows a dehydrated middle layer of glass like transparency, while outer layers are tanned in the normal way.

That this dehydration of the middle layer is an osmotic effect cannot be doubted. The objection that the hide is not closed by a semi-permeable membrance

can be easily overcome with evidence from the membraneless gelatine cubes. No enclosing membrane is needed to produce an osmotic effect. In the case of the system-hide containing water and highly concentrated tannin solution—the capillary water of the hide is diffusing quicker into the tannin solution than it is possible for the high molecular tannin to diffuse into the hide. The postulate for an osmotic effect in membraneless system is the difference in velocity of the two diffusion processes which proceed in opposite directions.



Furthermore, that case hardening cannot be related to the blocking of pores through oversized tannin molecules follows from the fact that case handening is reversible. It can be reversed by the addition of sufficient water to the system hide-tannin solution. By this not only is the concentration of the tannin solution brought down but also the middle layer of the case hardened hide recovers that is, it reaches the normal hydration level needed in tanning.



What is the significance of these considerations for the technology of tannin with vegetable tannins ? The following can be stated in this connection.

If a piece of pretanned hide-tanned with chrome or HCHO—is treated with highly concentrated solutions of vegetable tanstuff, then also an osmotic dehydration occurs ; however, in this case, that is harmless. A case hardening cannot take place here, because in a pretanned hide a sticking together of the hide fibres by dehydration to give a glassy layer, impenetrable to tannin solutions, is not possible. Even on drying in air, the fibres of a tanned hide remain separated. What is a tanned hide remain separated. What is valid for dehydration by drying in air, is valid equally for the osmotic dehydration. This behaviour can also be expressed as follows : in dehydration of an already tanned hide the pores remain open ; if the hide is not tanned, then the pores are closed.

Therefore, a pretanning makes it possible to use tannin solutions at as high concentrations as desired without case hardening. Pretanned hide material can be completely tanned through even by powder-form dry extracts. Such processess possess advantages. Not only is the tanning time greatly reduced, but also the entire extract is taken up by the hide, that is, the tannins together with the nontannins. By this a substantially better utilisation of the tannin extract is achieved.

Our considerations on case hardening and on preventing it by pretanning started from the phenomenon of osmotic dehydration. What holds good for the entire hide should also be valid for a individual hide fibre. In fact, with the aid of X-rays it can be shown that individual small fibres obtained by disintegration in a high speed disintegrator can be osmotically dehydrated in tannin solutions of high concentration. In this case the tannin is obviously fixed on the outer layers only.

Now, we have to consider the position with regard to tannin solution of medium or low concentrations, with which a strong osmotic effect is not to be expected. The principle question that arises here is whether or not the single fibre is through tanned.

A tanner considers a hide to be tanned through if the tannin solution has penetrated uniformly into all the layers of the hide. This kind of tanning through can be easily followed by means of the colour of the surface of the cut section. However, it is not possible to say anything about the type or degree of through reaction of individual hide fibres with tannin.

Just as the entire fibre assembly of the hide consists of fibres interspaces, so also the individual fibres externally appearing compact are built up of finer fibrillar units which are naturally separated by fibrillar interspace.

The fundamental structural units of collagen fibres are the protofibrils, which consist of chain-like rod-form collagen molecules oriented to one another. The next larger structural unit is the so-called fibril—a bundle formed by assembling of very many protofibrils in an arrangement like crystal-lattice; fibrils are seen only under the electron microscope and not under the light microscope. The fibrils in turn assemble together to form the so-called elementary fibres, which can be recognised under the light microscope as fundamental units of the actual hide fibres.

Substructures of The Hide Fibre

			Diameter	*Number of Proto-fibrils*
Protofibril	...	...	30A	———
Fibril	...	...	100A (0.1μ)	7.5×10^3
Elementary Fibre	...	...	5μ	1.7×10^7
Fibre	...	...	125μ	1.0×10^{10}

Corresponding to these morphological sub-structures of hide fibres, elementary fibres and fibrils, there must be separating interspace systems without which the morphological delineanation of these component structures would not be possible. So now the fibre contains a system of interfibrillary interspaces filled with water. It seems probable that the through-tanning of the fibres takes place stepwise, in this the tannin first reaches the interspaces between the elementary fibres and then the interspaces between the fibrils.

But it is possible that tannins penetrate into the fibrils, i.e., into the molecular lattice of collagen.

This question has been already largely considered and it has been established by calculations that tannin molecules of Turkish tannin can actually slip in between the protofibrils. But these calculations have not been experimentally verified.

We have experimental evidence for the fact that an external covering of collagen fibrils with organic tannins is sufficient to bring a distinct tanning effect suited for technical needs.

Such an evidence is given by the following experiments of Grassmann and Stadler, in which instead of mature collagen fibres the so-called procollagen fibrils were used. By this are understood such collagen fibrils as are obtained by recrystallisation of dissolved collagen. The two authors investigated comparatively the influence of vegetable tannins and of chromium salts on shrinkage temperature of these fibrils. They found that the vegetable tannins raised the shrinkage temperature almost instantaneously. The maximum T_s was reached 30 seconds after putting the fibrils into the tannin solutions. Chromium salts the penetration of which into the molecular lattice of collagen has been established by the electron microscope cause the shrinkage temperature to rise only very slowly so that even after 24 hours tanning the maximum T_s is not reached.

The following is another experiment which shows that a through-tanning of the fibril, i.e., the penetration of tannins into the molecular lattice, is not necessary for the tanning effect. Alcohol dehydrated hide pieces were soaked in a highly concentrated alcoholic solution of a phenolic resin. If the hide piece is dried then the fibre network of the hide piece becomes hard and brittle through fixation of the friable resin. If the hide piece still containing alcohol and soaked through by resin solution, is put into water then on subsequent drying a fine soft leather is obtained. The speciality about this leather is the absolute non-washability of the tannins.

What happens in this phenolic resin tanning ?. The actual tanning effect is brought about by the fact that the hide, impregnated with a phenolic resin is brought into water. Then the hide fibre becomes hydrated again. At the same time, the phenolic resin is precipitated so that a diffusion process cannot occur into the fibrils. However, a reaction between the protein chains on the fibril surface and the precipitated phenol resin between the fibrils seems necessary for the tanning effect. Because, if the same experiment is carried out with a nonphenolic indifferent resin, for example, with an alcoholic solution of colophony or rosin, then leather formation does not occur.

After all, what we know today viz. the all too simple theory of tanning, the idea of a cross-linking of protein chain through tannins does not prove right for phenolic tannins. That is a complete contrast to chrome tanning and tanning with formaldehyde.

In the past few days, the theory and practice of mineral tanning was presented and discussed. However, it is not the problems of mineral tanning only what need a thorough investigation. The vegetable tannins too, which in this large tanning country, India, play a large role, have still several puzzles. To direct attention to this point, after completion of the Symposium on Mineral tannages, is another planned purpose of this lecture, the main purpose of which however is to honour the memory of Prof. Das.

* Delivered at the Central Leather Research Institute, Madras on 30.1.64.

—Reproduced from "Leather Science"

BANTALA SET TO BECOME TOP LEATHER HUB ACROSS GLOBE : MR. AMIT MITRA

State Finance and Industry minister Mr. Amit Mitra said on 25th February that Bantala is poised to become the world's biggest leather hub, employing more than 6 lakh people in the next few years. The minister handed over letters of land allotment to 25 big tanneries at a programme in Bantala and said that the state government has taken all possible measures to convert the Calcutta Leather Complex (CLC) at Bantala into a mega leather cluster. "The government is all set to spend Rs 540 crore for massive infrastructure development at Bantala. Our intention is to turn the leather hub at Bantala into the world's largest," Mitra said. The leather industry at Bantala has a turnover of Rs 13,500 crore including export and local sale and employs more than 2.5 lakh workers directly.

Among the tanneries that were handed over allotment letters for land, 12 are from Kanpur and 12 from Kolkata, with 1 from Chennai.

Elaborating on the infrastructural development work to be taken up at Bantala, Mitra said that four common effluent treatment plants (CETP) are already undergoing repair, while the government has decided to come up with four more CETPs at an expense of Rs 168 crore. The repair work for CETPs will be completed in six months, while the four new plants will be completed in 15 months. Kolkata Metropolitan Development Authority is implementing the projects for CETPs. The government is also coming up with a dedicated pipeline for carrying the water treated by CETPs to the river. "We are spending Rs 100 crore for the project and the action is compliant with the pollution norms," Mitra said. He maintained that the state is setting up a dumping ground in Bantala to dump the silt after clearing the clogged canal. "I had an interaction with state Urban Development minister Firhad Hakim and he had said that it is not feasible to dump the silt at our existing dumping ground in Haldia, by carrying silt in trucks which may be toxic in nature. So, the decision was made to have a dumping place here," the minister said. The state is also coming up with a modern design centre and a road network as part of the infrastructure boost. Javed Ahmed Khan, minister for Disaster Management, said that the leather industry from North India is migrating to Bantala because the infrastructure for such industry is the best in Bengal. At present, there are 300 tanneries in CLC and 40 leather goods manufacturing units are operational. After installation of the new infrastructure, 200 more tanneries, 230 more leather units and footwear park can be set up on the available 230 acre land.

Mr. Mitra said that the state was focusing on labour-intensive growth in GDP with the view to create jobs and 1.5 lakh jobs had been created directly and indirectly in the place.

'We want to see that at least six to seven lakh jobs are generated here, direct and indirect', Mitra said. The state government handed over land allotment letters to 12 tanneries from Kanpur, the same number from Kolkata and one from Chennai.

Mitra said that the state government would spend to create the necessary infrastructure to create the complex as the largest leather cluster in the country. Presently, 300 tanneries and 40 leather manufacturing goods are located in the CLC. He said the complex was located on 230 acres of land.

(Millennium Post – 26/02/2019)

MERCHANDISE EXPORTS TO BE HIGHEST EVER IN 2018-19: MR. SURESH PRABHU

Commerce Minister Suresh Prabhu said that India's merchandise exports will peak at USD 330 billion in 2018-19 which will be the highest ever. Speaking on this occasion Suresh Prabhu said that Department of Commerce has identified 9 sectors of

gems and jewellery, leather, textiles, engineering, electronics, chemicals, pharma, agriculture and marine products to achieve at least 16% growth in exports in FY 19.

Commerce Minister further said that the Ministry has formulated India's first ever Agriculture Export Policy to double farmers' income by 2022, to boost India's agricultural exports to USD 60 billion by 2022 and double India's share in world agriculture.

Prabhu further added that the focus of the Ministry will continue to be on the manufacturing sector where India has the capacity to transform into a hub for global exports in many products. But India's prowess in services gives the country global edge and the large domestic market allows economic growth at a steady 7 percent. He added that India's goods export will peak at USD 330 billion in 2018-19 which will be the highest ever.

India's exports have seen high growth in the last six years through sector specific interventions, focused export promotion initiatives, greater transparency and quick resolution of issues. With the structural reforms that have been put in place over the last five years by the Ministry and action oriented plans for major sectors, Commerce Minister said that he is hopeful that India is on the path to become the 5th largest economy this year.

(SME Times – 07/03/2019)

INTERIM BUDGET 2019 – HIGHLIGHTS

1. Tax proposals 2019-2020 at a glance for Individuals

- Income Tax slabs will remain the same for FY 2019-20.
- No tax on notional rent of second Self-occupied House under "Income from House Property" (up to two self-occupied house properties) to be considered for exemption.
- Tax Rebate Limit under 87A increased from Rs. 3.5 lakhs to Rs. 5 lakhs for taxpayers. The maximum limit of the tax rebate increased to Rs.12,500 from the present limit of Rs. 2,500.
- TDS limit hiked from Rs 10,000 to Rs 40,000 on Post Office Savings and Bank Deposits.
- TDS threshold on rent increased from Rs 1,80,000 to Rs 2,40,000
- Standard Deduction for the salaried class increased from Rs 40,000 to Rs 50,000.
- Section 54 exemption now available on the second house property, provided the capital gains is less than or equal to Rs. 2 crores – to be availed only once in a lifetime.

2. Tax proposals 2019-2020 at a glance for Businesses, MSME & Real estate

- Benefits under Section 80-IBA to be extended for one more year – to the housing projects approved till 31 March 2020.
- Period of exemption from levy of tax on notional rent, on unsold inventories is extended from one year to two years, starting from the end of the year in which the project is completed.
- SMEs with earnings below Rs 5 Crores will soon file GST returns only once in 3 months.
- MSMEs and Traders to note that GST Registered SME units will get 2% interest rebate on an incremental loan of Rs. 1 Crore.
- The requirement of sourcing from SMEs by Government enterprises has been increased to 25% with 3% reserved for women-owned SMEs.
- A scheme of 'Business loans up to Rs. 1 crore in 59 minutes' will be implemented.

3. Measures for the poor and backward class

- 60,000 crores are being allocated for MGNREGA in Budget Expenditure 2019-20. Additional amount would be provided if required.

4. Women Empowerment

- Providing cleaner fuel for rural women – out of the 8 crores promised free LPG connections, 6 crores is already delivered under Ujjwala Yojana and remaining will be delivered in the coming year.

- More than 7,000 beneficiaries of PM Mudra Yojana are women. 15.56 crore loans of ¹ 7.23 lakh crore disbursed under MUDRA Yojana.
- Benefits of maternity leave of 26 weeks have provided support to women.

5. Banking Reforms & Insolvency and Bankruptcy Code (IBC)

- Outstanding loans of public sector banks increased from Rs 18 lakh crore to Rs 52 lakh crore. Under the clean banking initiative, the 4R approach i.e. Recognition, Resolution, Recapitalisation and Reforms is being followed.
- 3 banks namely Bank of India, Bank of Maharashtra and Oriental Bank of Commerce are out of Prompt Corrective Action (PCA)
- 8 public sector banks still remain within PCA framework which imposes restrictions on lending and expansion.
- IBC has instituted a resolution-friendly mechanism to speed-up recovery of NPAs. Consequently, Rs 3 lakh crore has already been recovered to this effect.
- A sum of Rs 2.6 lakh crore has been directed towards recapitalisation of Public Sector Banks (PSBs).
- Amalgamation of banks in place to avail economies of scale, better capital and wider geographical coverage.

6. Positive disruptions in Pension Sector

- Benefits to 10 crore workers in the unorganised sector as part of the Mega Pension Yojana.
- Contribute Rs. 55-100 per month and govt will contribute the same – to get Rs. 3000 pension monthly post 60.
- Over Rs 35,000 crore has been allocated under the 'One Rank One Pension' scheme for Defence personnels.
- Rs. 500 crore allotted for pension schemes for individuals in other sectors
- NPS rules amended in December are implemented – with increased Government contribution from 10% to 14%

7. Agriculture Reforms

- Minimum Support Price (MSP) fixed at 50% more than the cost for all the 22 crops.
- Pradhan Mantri Kisan Samman Nidhi (PM-Kisan) to benefit around 12 crore small and marginal farmers with direct income support of Rs 6000 annually. Rs 75,000 crore has been allocated to this.
- The amount of interest subvention has been doubled and crop loans to farmers increased to Rs 11.68 lakh crore.
- Allocation for Rashtriya Gokul Mission increased to Rs 750 crore. Rashtriya Kamdhenu Aayog has been established to genetically upgrade cow resources.
- Under Kisan Credit Card scheme, farmers pursuing animal husbandry and fisheries will get 2% interest subvention. An additional 3% interest subvention will be provided for timely loan repayment.
- Under National Disaster Relief Fund (NDRF), farmers affected by natural calamities will get 2% interest subvention. A prompt repayment incentive of 3% will be given for the entire loan re-schedulement period.

(Clear Tax.in –04/02/2019)

E-WAYBILL RULES CHANGED,GST EVASION GETS MORE DIFFICULT; WHAT TRANSPORTERS MUST KNOW

The government has announced certain changes in the e-way bill system to tackle the goods and services tax (GST) evasion. The new norms range from auto calculation of route distance to barring businesses from generating multiple bills based on a single invoice, the official website showed.

On April1, e-way bill system was launched for interstate movement of goods worth more than Rs 50,000. Similarly, the system for intra or within the state movement was introduced in a phased manner from April 15. Considering problem of transporters, e-way bill system has been enabled to auto calculate the route distance for goods movement, based on the Postal PIN codes of source and destination locations. According to the revised norms, the user is allowed to enter the actual distance as per the goods movement. Nevertheless, it's capped at 10 per cent above the distance displayed for the entry.

"**.....**if the system has displayed the distance between Place A and B, based on the PIN codes, as 655 KMs, then the user can enter the actual distance up to 720KMs (655KMs + 65KMs). In case, the source PIN and destination PIN are same, the user can enter up to a maximum of 100KMs only. If the PIN entered is incorrect, the system would alert the user as INVALID PIN CODE", - the website said. Nevertheless, the transported could continue entering the distance. The government has also decided not to allow generation of multiple e-way bills based on one invoice.

"The transporters had represented to incorporate the provision to extend the E-way Bill, when the goods are in transit. The transit means the goods could be on Road or in Warehouse. This facility is being incorporated in the next version for the extension of E-way Bill", the website also said.

(Financial Express - 23/02/2019)

CURRENT ACCOUNT DEFICIT WIDENS TO 2.5% OFGDP IN Q3 ON ACCOUNT OF A HIGHER TRADE DEFICIT

India's current account deficit (CAD) came in at $16.9 billion or 2.5% of the GDP in October-December 2018-19, up from $13.7 billion (2.1% GDP) in the year-ago quarter but lower than $19.1 billion or 2.9% of GDP in the preceding quarter. High merchandise trade deficits due to sluggish exports kept the CAD at relatively high levels in first three quarters of FY19, a period which also saw depletion of India's forex reserves, given also the relatively lower net inflows into the capital account.
On a balance of payment basis, the reserves shrank by $4.3 billion in Q3FY19 compared with depletion of $1.9 billion Q2FY19. The capital account saw a surplus of only $13.6 billion in Q3FY19, compared with $16.7 billion in the previous quarter and a robust $22 billion in the year-ago quarter, due to the continued weakness in portfolio inflows (net outflow of $2.1 billion in Q3FY19 despite a sequential improvement in debt flows) and the volatility in short-term buyer/supplier credits.

The capital account, however, is reckoned to have strengthened in Q4FY19. FPIs have bought shares worth over $7 billion and papers worth $560 million in the March quarter. This is the highest purchase by FPIs in both equity and bonds since June 2017. In June 2017, they had purchased a shares and bonds worth $11.9 billion.

During the April-June quarter of the current fiscal, strong outflows in FPI and short term credit (the latter because of the ban on banks issuing letters of undertakings in the aftermath of the Nirav Modi fraud) reduced the surplus in capital account to just $5.4 billion and resulted in a depletion of reserves by a substantial $11.3 billion. The CAD increased to 2.6% of GDP during April-December 2018 from 1.8% in the year-ago period on the back of widening of the trade deficit.

"The widening of the CAD on a year-on-year basis (in Q3FY19) was primarily on account of a higher trade deficit at $49.5 billion as compared with $44 billion a year ago. Net services receipts increased by 2.8% on a y-o-y basis mainly on the back of a rise in net earnings from telecommunications, computer and information services and financial services. Private transfer receipts, mainly representing remittances by Indians employed overseas, amounted to US$ 18.7 billion, increasing by 6.3% from their level a year ago," the RBI said in a statement.

In the financial account, net foreign direct investment at $7.5 billion in Q3 of 2018-19 increased from $4.3 billion in Q3 of 2017-18. Portfolio investment recorded net outflow of $2.1 billion in Q3 of 2018-19 — as compared with an inflow of $5.3 billion in Q3 last year — on account of net sale in the equity market. Net inflow on account of external commercial borrowings increased to $2.0 billion in Q3 of 2018-19 from $0.3 billion a year ago.

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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-Stiasnay 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.
- 8th Asian International Conference on Leather Science & Technology (AICLST) was organized by ILTA in 2010 during its' Diamond Jubilee Celebration year.

SEMINAR & SYMPOSIUM

ILTA organizes 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 this iconic personality.
- Seminar on the occasion of India International Leather Fair (IILF) at Chennai in February every year.

It has also organized :

- Prof. Y. Nayudumma Memorial Lecture.
- Series of Lectures during "Programme on implementing Emerging & Sustainable Technologies (PrIEST)".
- 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 31.03.2018) 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.

68 YEARS OF SERVICE TO THE INTERNATIONAL LEATHER FRATERNITY

Indian Leather Technologists' Association

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

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ILTA
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