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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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JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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# China striding ahead fast

"Hide your strength, bide your time, never take the lead"; was the philosophy of former Chinese leader Deng Xiaoping, the architect of the market reforms in the 1970s and 1980s which set the Chinese economy careening towards modernity. This maxim underpinned Chinese policy for decades, allowing the Asian giant's economic rise to go largely unchallenged. Many countries drooled at the sight of a swelling new export market, while Western firms ploughed in FDI.

In 2017, current leader Xi Jinping sounded the death knell for Deng's approach. Speaking at the 19th National Congress—amid a power vacuum left by Donald Trump's mercantilism and the EU's internal wrangling over Brexit—he promised that China would adopt a more determining role in world affairs. On the economic front, this is to be achieved through two key policies. Externally, the Belt and Road initiative (BRI) is using Chinese capital and knowhow to drive infrastructure development overseas. Domestically, Made in China 2025 (CM2025) seeks to transform the manufacturing sector, moving up the value chain and nurturing world-beating firms in emerging sectors to avoid the fabled middle-income trap. Both schemes could transform the global economic structure, and Beijing has repeatedly moved to assure other countries that they stand to benefit.

But not everyone is convinced. While the BRI has seen a surge in investment to developing economies and created tens of thousands of jobs, unease is building over onerous debt burdens, leading many countries to scale back their engagement. And CM2025 has stoked fears that the Asian giant will become a direct economic competitor to the West, which is at the heart of the ongoing trade conflict with the U.S. Faced with rising pushback, the Chinese government has shifted its stance: It is taking a more rigorous approach to BRI projects; has dialled down mentions of CM2025; and is locked in talks with the U.S. regarding contentious areas such as forced technology transfers and creating a level playing field for Western firms in China. Whether or not these initiatives succeed will have a key bearing on the global economy in the decades to come. The BRI was initially conceived in 2013 as a way of linking China to Central Asia in a throwback to the ancient Silk Road, but its scope has since been radically extended. Today, the project is highly heterogeneous and toweringly ambitious, comprising countries representing around two-thirds of the world's population and over one-third of global GDP. It is focused largely on the developing world, but not exclusively. In late March, for example, China scored a major diplomatic coup by signing up G7 member Italy—to the ire of the U.S.

Against the backdrop of a global infrastructure gap estimated at USD 15 trillion, the BRI focuses on building critical structures such as ports, roads, bridges and railways. Over USD 200 billion has been invested to date—often in countries shunned by traditional lenders—with over 200,000 jobs created in the process. Total investment over the lifetime of the scheme could top USD 1 trillion, according to some estimates.

Analysts at Nomura see a symbiotic relationship: "It helps China address manufacturing overcapacity issues and increase exports. For BRI countries, "Increases in investment, trade, tourism and integration are expected", they added.

Joanna Konings, an economist at ING, focuses on the potential impact on trade: "The Belt and Road Initiative (BRI) is increasing transport connections between Asia and Europe. […] A halving in trade costs between countries involved in the BRI could increase world trade by 12%."

While the BRI focuses on enhancing economic cooperation with the rest of the world, CM2025 is the government's blueprint to transform the domestic economy. Directly inspired by Germany's Industrie 4.0 proposals, CM2025 is an aggressive response to concerns over a shrinking workforce, environmental degradation and rising domestic wages, which raise the spectre of a pincer movement.

"China is at risk of being squeezed from two sides – the low cost countries, where production of consumer products, like consumer electronics, increasingly reside, and the developed ones, where higher value added products should return thanks to the fourth industrial revolution", argue economists at Euromonitor.

The government aims to establish Chinese technological leadership in 10 key sectors, including AI, robotics, new energy

vehicles and aerospace. Ambitious targets are set for domestic production of key industrial components which are currently imported, such as semiconductors.

China's ongoing reliance on foreign technology has been brought into sharp relief by the trade dispute with the U.S. In 2018, the Trump administration forced American chip manufacturers to stop supplying Chinese firm ZTE; smartphone production at ZTE promptly ground to a halt.

Beijing is putting its money where its mouth is. A report from the EU Chamber of Commerce speaks of "hundreds of billions of euros of funding in the form of subsidies, funds and other channels of support".

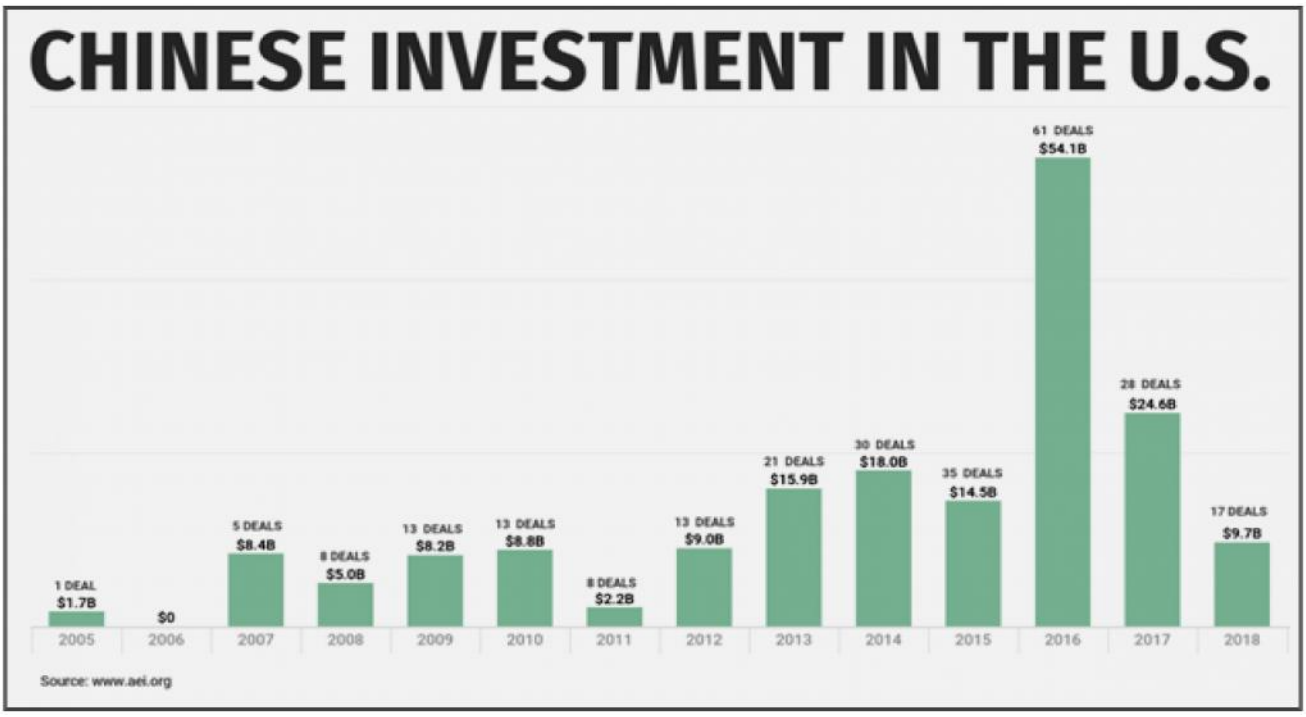
A significant chunk of this capital is being ploughed into an unprecedented acquisition spree, with Chinese firms hovering up foreign rivals in an effort to gain technological nous. According to data from the U.S. Chamber of Commerce, China's outbound investment in the semiconductor industry soared from less than USD 1 billion before CM2025 was announced to USD 35 billion by 2015.

Considered jointly, the BRI and CM2025 suggest a significant realignment of the global economy. They envisage a world with the Asian giant at its heart, developing cutting-edge technology in-house which is then exported using Chinese-funded infrastructure to the rest of the globe.

However, success is by no means a foregone conclusion, and the economic upshot may not be wholly positive—even for China itself.

Most of the potential trade benefits from the BRI have yet to be felt. As Konings says: "the majority of projects identified with the BRI so far are still in their construction phases. Trade facilitation may improve as BRI projects are completed, but this may be piecemeal. Significant progress may have to wait for co-ordinated action along whole trade routes."

Moreover, concerns over the cost of BRI for recipient countries—many of which already have fragile fiscal positions—and the associated accumulation of debt could scupper potential projects before they hatch. In 2019, Malaysia's new government threatened to scrap a USD 20 billion BRI rail project due to cost concerns, finally agreeing on a much slimmed-down version of the scheme. Myanmar and Pakistan have also scaled back their BRI commitments, while Sierra Leone recently ditched Chinese-backed plans to build a gleaming new airport after warnings from the IMF and the World Bank. Some countries have already been forced to renegotiate their loans. Ethiopia is the latest example; after being a major beneficiary of Chinese finance over the last decade, in March the government announced it aimed to restructure borrowings related to a railway linking the capital to neighboring Djibouti, amid "serious stress" on repayment capability.



"Markets such as Pakistan and Sri Lanka are already heavily indebted and being involved in the BRI strains their public finances. Sri Lanka, especially, had to hand over its strategic port of Hambantota to China as it was struggling to pay its debt to Chinese companies," comments Mahamoud Islam, senior Asia economist at Euler Hermes.

Cries in some quarters of "debt-trap diplomacy" may be overblown; aside from the notable exception of Sri Lanka, China has repeatedly shown flexibility over loan repayments. But a failure to address legitimate worries could still sink the scheme, and elevated public debt levels in developing countries could have an economically corrosive effect, by reducing cash available for investment in growth-enhancing areas. Moreover, substantial write downs on loans could hurt profitability at the Chinese financial institutions which bankroll the BRI, such as the China Development Bank and the Export-Import Bank of China. And enhancing infrastructure in developing countries could allow foreign firms to compete on a more even keel with their Chinese counterparts, hitting the Asian giant's already embattled manufacturing sector.

Made in China 2025 has caused even greater alarm—particularly in the U.S. and EU, who's firms tend to dominate the industries in which China seeks to establish global leadership—and the economic impact is far murkier. Following a surge in acquisitions by Chinese firms, in 2018 Donald Trump beefed up CFIUS—the committee charged with overseeing FDI—amid concerns the U.S' technological edge was being blunted. Disputes over intellectual property rights and forced technology transfers are at the crux of ongoing trade talks between the two nations. The EU, which had until recently adopted a more emollient approach, has ratcheted up the rhetoric; a European Commission paper from March this year describes China as a "systemic rival" and an "economic competitor". While CM2025 offers benefits in the form of potentially innovative new goods and services, developed nations' external sectors could be hit. As the EU Chamber of Commerce says, "in the long term CM2025 amounts, in large part, to an import substitution plan. Market access for European business can therefore be expected to shrink."

With Chinese firms giddy on state subsidies, and answering to government diktats rather than conventional market forces, overcapacity is another concern, with the excess dumped onto global markets—as has already happened with steel and solar panels. This could stifle R&D efforts and leave foreign competitors floundering. Within China itself, the metamorphosis of the industrial sector won't be painless. "Disposal of low value-added operations, like consumer electronics assembly, might be hurtful for the economy, where a significant part of the population is employed", argue economists at Euromonitor. Moreover, the danger of such a top-down industrial strategy—in stark contrast to Germany's Industrie 4.0, which seeks to encourage collaboration with local stakeholders—is that huge sums of public money are ploughed into a blind alley, creating products for which there is no discernible market demand.

Faced with rising criticism of both of its signature policies, China has changed tack. BRI financing has been reigned in, and the authorities are moving to boost governance standards and auditing mechanisms. The focus of the BRI is also shifting, towards collaboration and joint projects. Third-party agreements have been inked with countries such as France, Spain and Australia, which will see them club together with China to carry out projects. The direction of travel ; towards a lower-key, more selective and higher-quality scheme. And for all its recent travails, the BRI still boasts impressive pulling power. A summit in April attracted dozens of world leaders and high-ranking officials. Concerning CM2025, China has also switched to a softly-softly strategy—in an attempt to keep the initiative off the public radar. Unlike in previous years, Premier Li Keqiang did not mention the project once at his annual address at the 2019 National People's Congress.

There have been some changes of substance too. Following talks with the EU, China recently signalled its willingness to negotiate over forced technology transfers and discuss new rules on industrial subsidies. Talks with the U.S. could yield similar concessions. Nevertheless, Chinese leaders will not renounce their end goal of achieving economic leadership in emerging industrial sectors. If anything, the trade conflict with the U.S. will only have strengthened their resolve, by laying bare the importance of technological self-sufficiency.

Through the BRI and CM2025, China aims to assert itself at the forefront of the global economy. In doing so, China's leadership is marking a decisive break from Deng's prescriptions of a greater role for market forces in the economy, and an unassuming foreign policy. That said, one of Deng's maxims is still just as relevant to today's crop of leaders, and runs right through both policy initiatives: "to get rich is glorious".

Goutam Mukherjee

Dr. Goutam Mukherjee
Hony. Editor, JILTA


Leather Fraternity 69 years of service to the International

# *From the desk of* General Secretary

**69th Foundation Day Celebration**

Above will be organized on Wednesday 14th August, 2019 at the Seminar Hall of Science City, JBS Haldane Avenue, Kolkata – 700 046 as per the programme given below :-

| | | |
|---|---|---|
| 02.00 PM | : | Registration |
| 03.00 PM | : | Welcome Address by Mr. Arnab Jha |
| | : | Garlanding of portrait of Prof. B. M. Das |
| | : | Presentation of B. M. Das Memorial Medal |
| | : | Presentation of J. M. Dey Memorial Medal |
| | : | Presentation of J. Sinha Roy Memorial Award |
| | : | Presentation by the recipients of Awards |
| | : | Lecture titled "Innovative, Sustainable Solutions : Leather Process, Biodegradability – Stahl" by Mr. Prasanna Kumar Maduri, Campus Manager, Stahl India Private Limited, Kanpur |
| | : | B. M. Das Memorial Lecture titled "Environmental Issues related to Tanning Industry" by Prof. Amitava Bandyopadhyay, Dept. of Chemical Engineering, University of Calcutta |
| | : | Vote of Thanks by Mr. Susanta Mallick |
| 06.00 to 06.30 PM | : | Tea Break |
| 06.30 to 08.30 PM | : | Cultural Programme – Eminent Folk Singer : Mr. Pranesh Som |
| 08.30 PM | : | Dinner |

Individual invitation cards have been posted on 30th July, 2019. Families of the Invitees are most Welcome to the Cultural Programme & Dinner, invitation Cards for which may be collected at the time of registration.

## BEREAVEMENT

With profound grief and a heavy heart we announce the sad demise of Mr. Bani Prasad Gorai, a Life Member of our Association.

On 22nd July, 2019, when we received a phone call from Late Gorai's son advising us of his father's demise on the same day at around 12.00 mid day.

May his soul rest in peace and may God give strength to the members of the bereaved familiy to bear the irreparable loss.

**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. 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.**

# Determination of Effiency of Microbes from Tannery Effluent for Effective Pollution Control

[1] Dr. Aparna Halder, Associate Professor, [2] Dr. Haripada Bhaumik, Ex-Principal

[1 & 2] Govt. College of Engineering & Leather Technology, Kolkata

**Abstract :**

An attempt has been made to find out the efficiency of the isolated hyperactive bacteria from secondary wastewater of existing activated sludge treatment system. For that, samples were collected from effluent treatment plant of Mokamehghat, Bihar. and 65 strains were isolated in pure form from the sample of activated sludge plant. The efficiency of each strain of bacteria was evaluated with reference to BOD, $NO_3$, $PO^{-4}$ parameters. Among 65 strains few strains were more active in decomposing organic matters. From the above study it has been found that if the effluent in activated sludge is treated with specific efficient microbes (Formulated bioculture) then better BOD reduction could be achieved, simultaneously indirectly increasing the organic load by addition of flock can be avoided.

**Introduction :**

Industrial Tanning consumes huge amount of water industry, approximately 30-40 litres of water is used for processing one kg of raw hide/skin into finished leather. The quantity of water consumption and nature of wastewater discharge from tanneries depend on type of tanning process, capacity of tannery and its production pattern. The waste water coming out after tanning operations contains many harmful chemicals and also plenty of organic matters.

In India the total wastewater discharge from the industry has been estimated as about 90,000$m^3$ per day [1]. This water needs to be treated before discharging to natural stream to avoid serious environmental hazards. There are many methods to treat the wastewater. Biological treatment with the help of microbes is one of them. The normal wastewater treatment system involves aerobic activated sludge treatment system containing thousands of varieties of microbes and thus the efficacy of this biological treatment depends on the efficiency of these microbes. The objectives of the biological treatment of wastewater are the removal of carbonaceous materials, the coagulation of nonsettleable colloidal solids and the stabilization of organic matter. In accomplishing this type of treatment, a variety of microorganisms, principally chemo heterotrophic bacteria are of primary importance because of their requirement for organic compounds in addition to both carbon and also energy. When treatment objectives include the conversion of ammonia to nitrate, the chemoautotrophic nitrifying bacteria are significant. The microorganisms are used to convert the colloidal and dissolved carbonaceous organic matter into various gases and into cell tissue, because cell tissue has a specific gravity slightly greater than that of water and the resulting cells can be removed from the treated liquid by gravity settling. It is noteworthy that unless the cell tissue produced from the organic matter is removed from the solution, complete treatment is not accomplished because the cell tissue, which itself is organic will influence the BOD measurement of the effluent.

Decomposition of organic matters in wastewater is an aerobic process; oxygen is introduced in the reaction mixture during the process. The aerobic environment in the reactor is achieved by the use of diffused or mechanical aeration, which also serves to maintain homogeneity of mixed liquor. The microorganisms involved in decomposition are bacteria, they are found almost universally in nature though in large numbers in decaying organic matter. The bacteria which are involved in waste water treatment are mostly aerobic and facultative. Different types of species of bacteria act synergistically to decrease the organic load in effluent. Activated sludge is the name used to describe aerobic biochemical operations which use a flocculent microbial slurry to remove soluble and colloidal organic matter.Gravity

[2]Corresponding author E-mail : gmgcelt@gmail.com

settling is very widely employed to separate the biomass from the treated effluent. Activated sludge represents a complicated mixture of viruses, bacteria, protozoa and other organisms, found either singly or clumped together, often enmeshed in a fabric of organic debris, dead cells and other waste products. Generally the organisms in an activated sludge culture may be divided into four major classes : floc-forming organisms, saprophites, predators and nuisance organisms. Although organisms present in activated sludge systems range from viruses to multicellular organisms, the predominant and most active are heterotrophic bacteria and to a much lesser extent, autotrophic bacteria, which are both aggregated in the sludge flocs and dispersed in the liquor. The inportance of other organisms is only from the point of view of their relationship to bacteria. Heterotrophic bacteria utilize organic material as a source of both carbon and energy, while autotrophic bacteria generally depend on the oxidation of mineral compounds for energy requirements and utilize carbon dioxide as a carbon source. Some species of bacteria may utilize a wide variety of different organic compounds. In heterogeneous substances, specific constituents may or may not be preferentially utilized. On the other hand, some substances which can not be easily utilized as a sole source of carbon and energy may be metabolized in combination with other compounds. Usually a large number of different bacterial species are present in the activated sludge.[2,3]

**Materials and Methods :**

In this investigation 65 bacterial strains were isolated from secondary treated effluent of activated sludge of effluent treatment plant.

**Method of isolating pure culture :**

For isolation of pure culture the first step is to prepare the media and then cultivation of bacteria and isolation as explained in the following paragraph.

**Preparation of media :**

For the cultivation of heterotrophs certain complex raw materials such as peptones, meat extract and yeast extract were used and the resulting media support the growth of a wide variety of heterotrophic bacteria.. 3 gms Beef extract, 5 gms Peptone, 15 gms Agar, 3 gms Yeast extract were dissolved in 1000 ml distilled water (except Agar ) and pH was adjusted to 7. Then agar was added and the medium was boiled until a homogeneous suspension was obtained. The medium was dispensed into flasks and sterilized by autoclaving at 15 lb pressure for 20 minutes prior to pouring into sterile petridishes. Media were stored under refrigeration until needed.[4]

**Cultivation of bacteria :**

The sample containing mixed culture was first diluted in sterile distilled water to contain only a few cells per milliliter before being used to inoculate the virgin sterile agar media prepared in the laboratory. Since the number of bacteria in the specimen is not known, serial dilutions were made so that at least one of the dilutions will contain a suitably sparse concentration of cells from which cell count can be obtained easily. From each dilution 0.1 ml was spread on the surfaces of separate sterile agar plates and incubated at $37^0$C for 24 hours to get distinct colonies.[4]

**Isolation :**

After cultivation of bacteria, by means of a transfer loop, a portion of the distinct bacteria colony was placed on the surface of a sterile agar medium and streaked across the surface. Pure cultures have been isolated by several times streaking.

By following the same process 65 bacterial strains were isolated in pure form from the sample of Activated sludge plant.

**Determination of efficiency of isolated pure strain :**

The Primary treated tannery effluent samples were collected separately in sterilized bottle and brought back to the laboratory in an ice packed container for determination of relative efficiency of each pure strains so isolated and purified.The collected samples were put in BOD bottle and inoculated with isolated and purified strains individually. The initial dissolved oxygen content was measured at 4 hrs interval for $1^{1/2}$ days and 8 hrs interval for another day for ten strains. In the same pulse simultaneously $NO_3^-$ and $PO_4^{3-}$ concentration were determined .The results of $NO_3^-$ and $PO_4^{3-}$ are shown in table- I and BOD values are presented graphically in figures B1-B10 for 10 pure strains in the appendix-I.

The efficiency of each strain of bacteria was evaluated with reference to the following parameters - BOD, $NO_3^-$, and $PO_4^{3-}$. BOD efficiency of each bacteria, $NO_3^-$ and $PO_4^{3-}$ measurements were carried out according to following processes.

**Biochemical oxygen demand ($BOD_{2.5}^{35} = BOD_5^{20}$) :**

The method consists of filling with sample, to overflowing, an airtight bottle of the specified size and incubating it at 35$^0$c for 2.5 days. Dissolved oxygen is measured initially and after incubation and the BOD is computed from the difference. This method is an empirical test (Lenore S. et al 1998) to determine the relative oxygen requirements of waste, effluent and polluted water.

1% dilution is made in the case of determination of BOD of primary treated effluent based on the prescribed extent of dilution of 1-5% for settled sewage. Pure bacterial culture on the tip of the needle is added in 100 ml distilled water. 0.1 ml of this dilution is used for seeding in 150 ml sample of 1% dilution.[5]

**Procedure :**

50 ml of 1% of dilution of primary treated tannery waste is taken to measure its dissolved oxygen content ($D_1$) after seeding. A centrifuge tube of 70 ml capacity is filled to the brim with the dilution water containing the sample and the seed microbe in the above proportion. The tube is sealed with cap and kept in the incubation chamber at 35$^0$C for 2.5 days. Its D.O. is measured using an aliquot ($D_2$). The dissolved oxygen content of the dilution water containing seed is also measured ($B_1$).The same is also incubated for 2.5 days at 35$^0$C in the 70 ml centrifuge tube and then also its D.O. is measured ($B_2$).

$$BOD_5^{20}\ (mg/l) = BOD_{2.5}^{35}\ (mg/l) = \frac{(D_1 - D_2) - (B_1 - B_2)\ .f}{P}$$

f is the ratio of seed in diluted sample to the seed in seed control or the % of seed in diluted sample / % of seed in seed control.[5]

P = Decimal fraction of sample used.

**Procedure for nitrate ($NO_3^-$) determination :**

Nitrate determination was carried out by semi-quantitative method by reducing to nitrite reacting with sulfanilic acid in an acidic medium to form diazoniam salt. This salt was then mixed with benzoic acid to produce orange-yellow colour, which was compared with precalibrated colour card. For this purpose nitrate filled testing kit (Aquamerck) was used for nitrate estimation of the samples.

**Procedure :**

The test bottle was rinsed with the sample tannery waste water and filled to the 5-ml mark. Then 1 level micro spoon of reagent was added to the test vessel. The test vessel was closed with the lid and shaken well for 1 minute. After 5 minutes the test vessel was placed on the precalibrated colour card and matched with a colour comparison value to find the quantity of nitrate.

**Procedure for phosphate ($PO_4^{3-}$) determination :**

It was determined by the isopoly acids, which occur in acidic solution after reacting with ammonium heptamolybdate. These isopoly acids are then converted to corresponding heteropoly acids with phosphate. These yellow coloured solution containing phosphomolibdic acids were subsequently converted by reduction into blue coloured solutions and determined calorimetrically. Phosphate filled testing kit (Aquamerck) was used to determine the phosphate content of tannery waste water.

**Procedure :**

The test vessel was rinsed with the sample waste water and filled to the 5-ml mark. 5 drops of reagent No.1 was added and swirled. Then 1 level of microspoon of reagent No. 2 was added and dissolved by swirling. After 2 minutes the test vessel was placed on the colour card and matched with a colour comparison value which gives the indication of phosphate content in the effluent.

**Results :**

Tannery wastewater treatment is a complex and difficult task. To preserve the environment the treatment of tannery wastewater before it is discharged to natural stream is must. BOD reduction of wastewater treatment is of paramount importance. In the present case the study of BOD reduction has been carried out mainly.

From the study carried out in this work the efficiency of 10 pure strains among 65 pure strains have been shown graphically in

the figures from B 1 - B 10 respectively in the appendix-I. The bacterial strain, which reduces BOD level to a lower value shown in graph B1, is considered most active since as reduced BOD indicates lower level of organic load which really means the removal of the organic compounds from the waste water is maximum. Of the other two parameters i.e. $NO_3^-$& $PO_4^{3-}$, the difference between the initial and the final values shown in table-1 in the appendix-I is so meager that the change in values appears very insignificant unlike the BOD parameter.

**Discussion :**

In composite tannery waste treatment the organic matters are decomposed in presence of various microbes. Generally the mechanism going on in decomposition is as follows :

1. Catabolism - $C_xH_yO_zN + O_2 \xrightarrow{\text{bacteria action}} CO_2 + HO_2 + NH_3$+Energy
2. Anabolism - $C_xH_yO_2N$ + energy $\xrightarrow{\text{bacteria action}}$ $C_5H_7NO_2$ (Bacterial Cell )
3. Autolysis - $C_5H_7NO_2 + 5O_2 \xrightarrow{\text{bacteria action}} 5CO_2 + NH_3 + 2H_2O$ +Energy

Some of nitrifying bacteria produce $NO_3^-$ from $NH_3$ in the system. $PO_4^{3-}$ consumption is also there in the metabolic activities of microbes where $PO_4^{3-}$ acts as an essential nutrient. In the present study of efficiency determination, it is clear that BOD is the significant parameter, rather than $PO_4^{3-}$ & $NO_3^-$ estimation in appreciating the efficiency judgement of microbes in waste water treatment. The graphical expression of BOD denotes that the growth of bacteria is increased exponentially and BOD or organic matter is decayed exponentially.

**Conclusion :**

The leather industry is under pressure from various groups to adopt environment friendly methods of processing. Since tannery effluent is complex in nature, the treatment and disposal of tannery waste water to meet the pollution control standards is a difficult task and require specialized technological input. The present study provides useful information regarding bacteriological treatment technologies with preservation of environment for secondary waste water treatment. It will also be interesting to study of all spectrum of microbes present in activated sludge process and formulate the bio-cultures for utilization in ETP of leather industry to make leather industry more eco-friendly.

**Acknowledgements :**

The authors wish to acknowledge the cooperation and guidance of Dr. H.P. Bhowmik, Ex-Principal of Govt. College of Engineering and Leather Technology and assistance of my teachers Prof. Dr. Buddhadeb Chattopadhyay, Prof. (Dr.) Sanjoy Chakraborty and all colleagues of GCELT.

The author expresses her sincere gratitude and thanks to Mr. A. Sahasranaman, Regional Programme coordinator for pollution control in the Tanning Industry in South – East Asia, for cooperation, inspiration and the financial support from UNDP through him.

The author also acknowledges with thanks the kind co-operation and helpful comments from Mr. S. K. Sachdeba, Vice-President, BATA, Mokamehghat, Bihar and Mr. S.R. Raha, Sr. Manager, BATA, Kolkata during collection of samples from BATA, Mokamehghat, Bihar.

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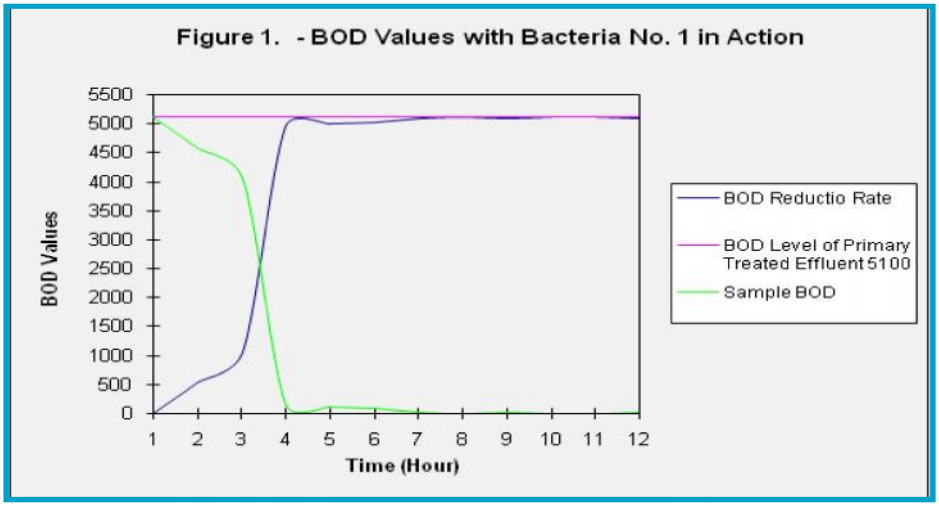
**Appendix-I Table 1 : Relative efficiency with respect to $NO_3^-$ and $PO_4^{3-}$ of ten microbial strain**

| Sample No. | Parameters $mgL^{-1}$ | 8 hrs | 12 hrs | 16 hrs | 20 hrs | 24 hrs | 28 hrs | 32 hrs | 36 hrs | 44 hrs | 52 hrs | 60 hrs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $NO_3^-$ | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 12 | 15 | 15 | 15 |
| | $PO_4^{3-}$ | 3 | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.5 | 2.5 | 2.5 | 2.5 |
| 2 | $NO_3^-$ | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 12 | 15 | 15 | 15 |
| | $PO_4^{3-}$ | 3 | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.5 | 2.5 | 2.5 | 2.5 |
| 3 | $NO_3^-$ | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 12 | 15 | 15 | 15 |
| | $PO_4^{3-}$ | 3 | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.5 | 2.5 | 2.5 | 2.5 |
| 4 | $NO_3^-$ | 10 | 10 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 5 | $NO_3^-$ | 10 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 12 | 12 |
| | $PO_4^{3-}$ | 3 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| 6 | $NO_3^-$ | 10 | 10 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 7 | $NO_3^-$ | 10 | 10 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 3 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 8 | $NO_3^-$ | 10 | 10 | 10 | 10 | 10 | 13 | 13 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 3 | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.6 |
| 9 | $NO_3^-$ | 10 | 10 | 10 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 3 | 2.8 | 2.8 | 2.8 | 2.8 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 10 | $NO_3^-$ | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 13 | 13 | 13 | 13 |
| | $PO_4^{3-}$ | 3 | 3 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |



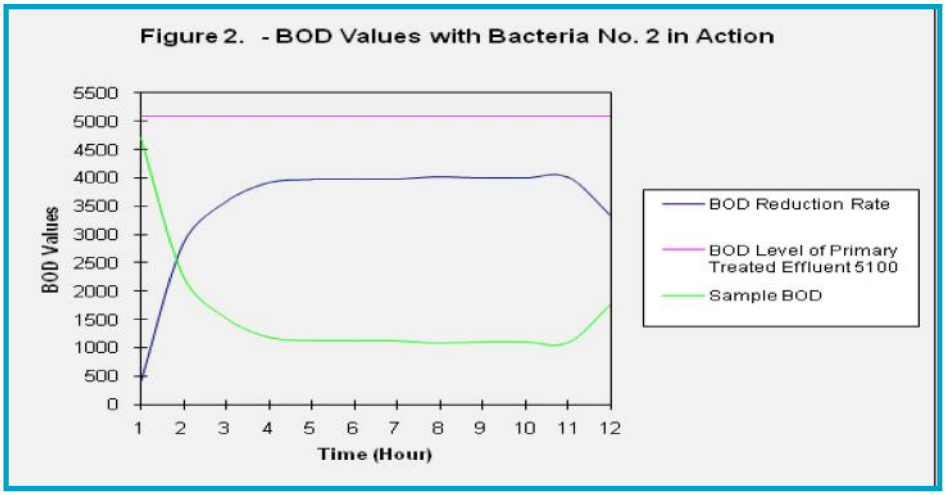



Figure 3. - BOD Values with Bacteria No. 3 in Action

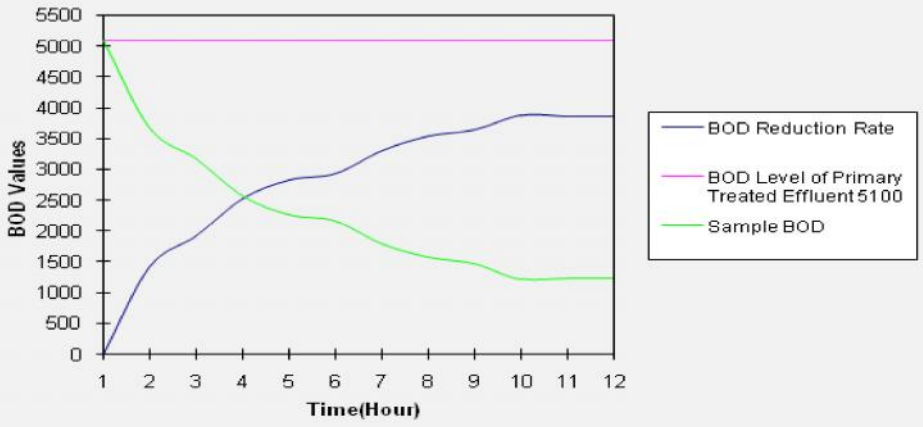



Figure 4. - BOD Values with Bacteria No. 4 in Action

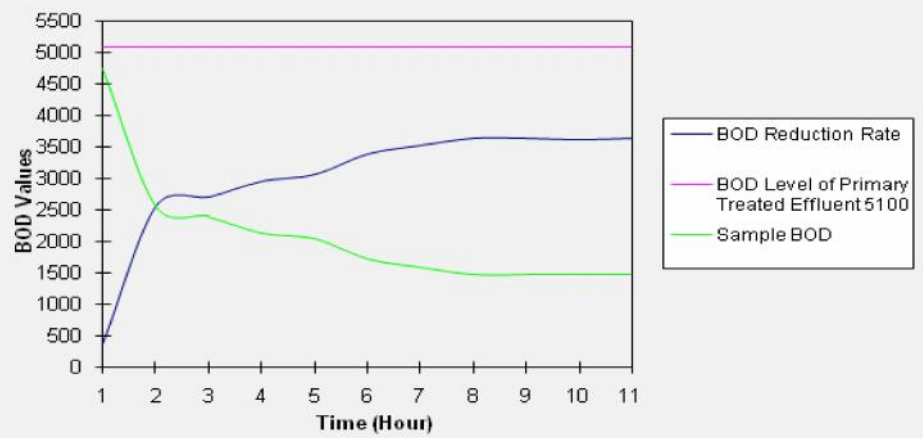



Figure 5. - BOD Exert and Reduction by Bacteria No. 5

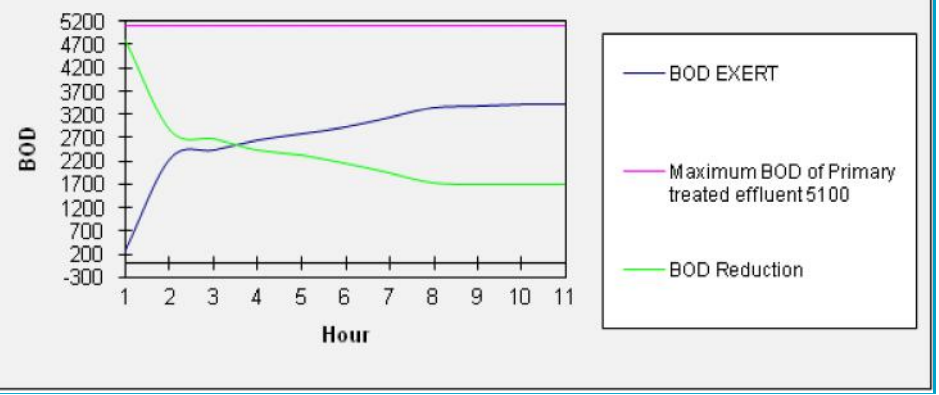


Figure 6. - BOD Exert and Reduction by Bacteria No. 6

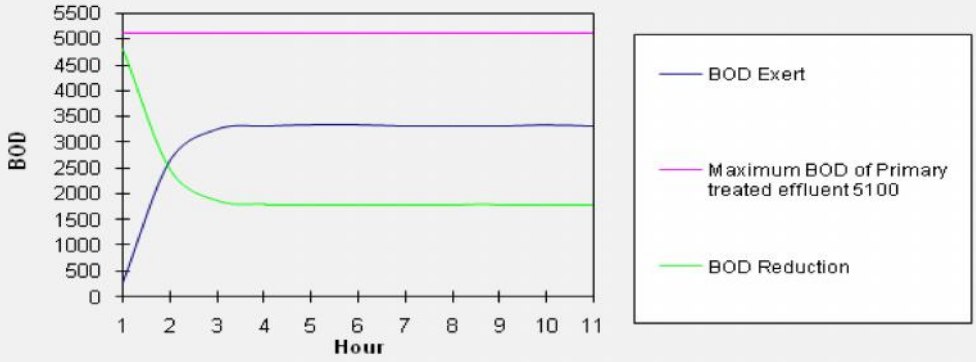



Figure 7. - BOD Exert and Reduction by Bacteria No. 7

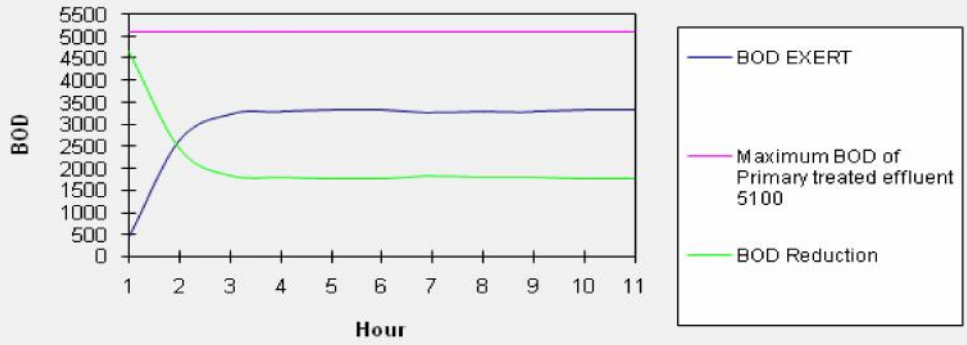
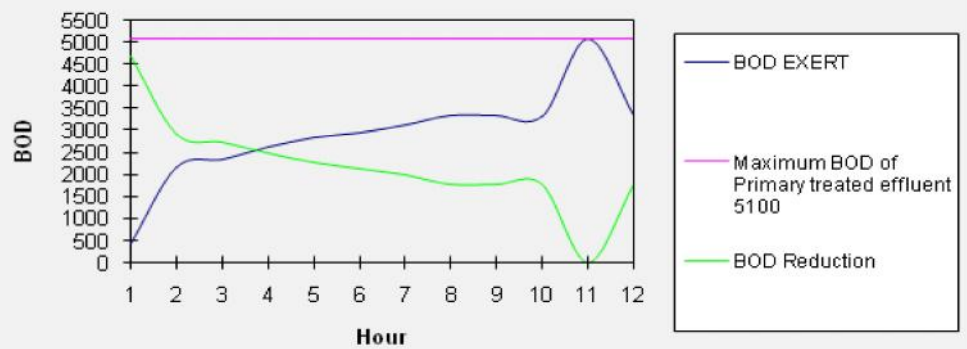



Figure 8. - BOD Exert and Reduction by Bacteria No. 8



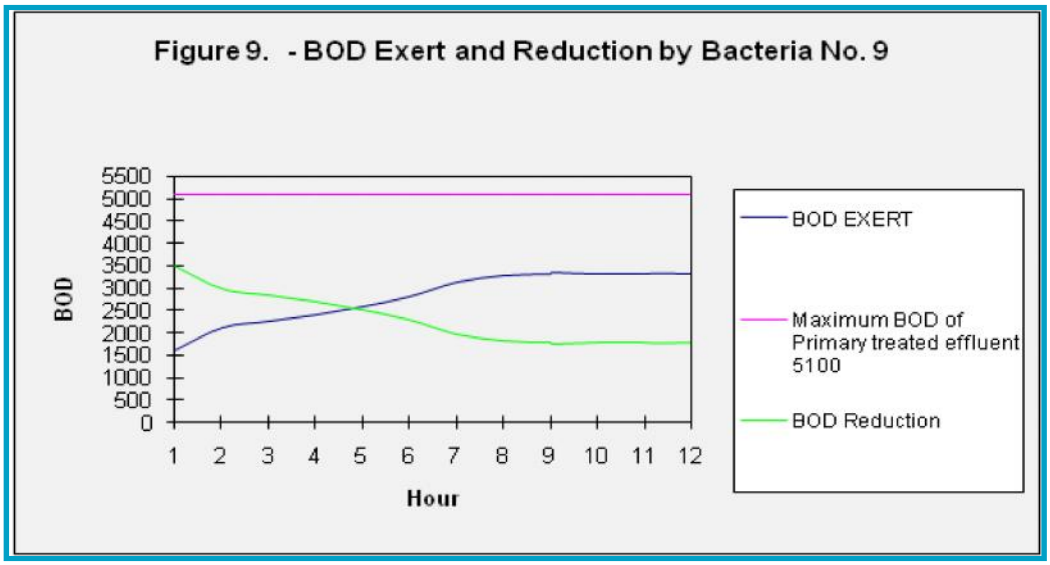


Figure 9. - BOD Exert and Reduction by Bacteria No. 9
BOD
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1 2 3 4 5 6 7 8 9 10 11 12
Hour
BOD EXERT
Maximum BOD of Primary treated effluent 5100
BOD Reduction

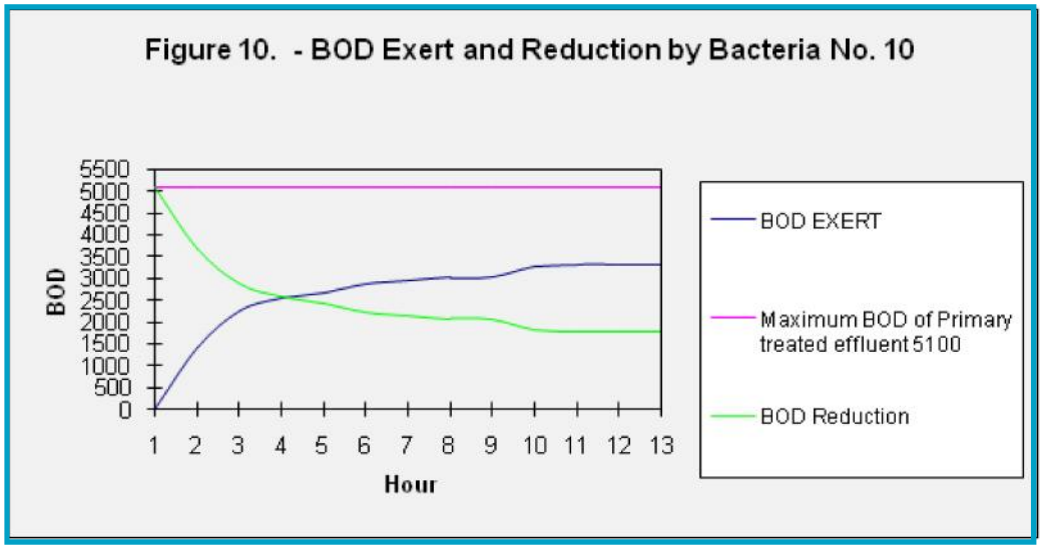


Figure 10. - BOD Exert and Reduction by Bacteria No. 10
BOD
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1 2 3 4 5 6 7 8 9 10 11 12 13
Hour
BOD EXERT
Maximum BOD of Primary treated effluent 5100
BOD Reduction


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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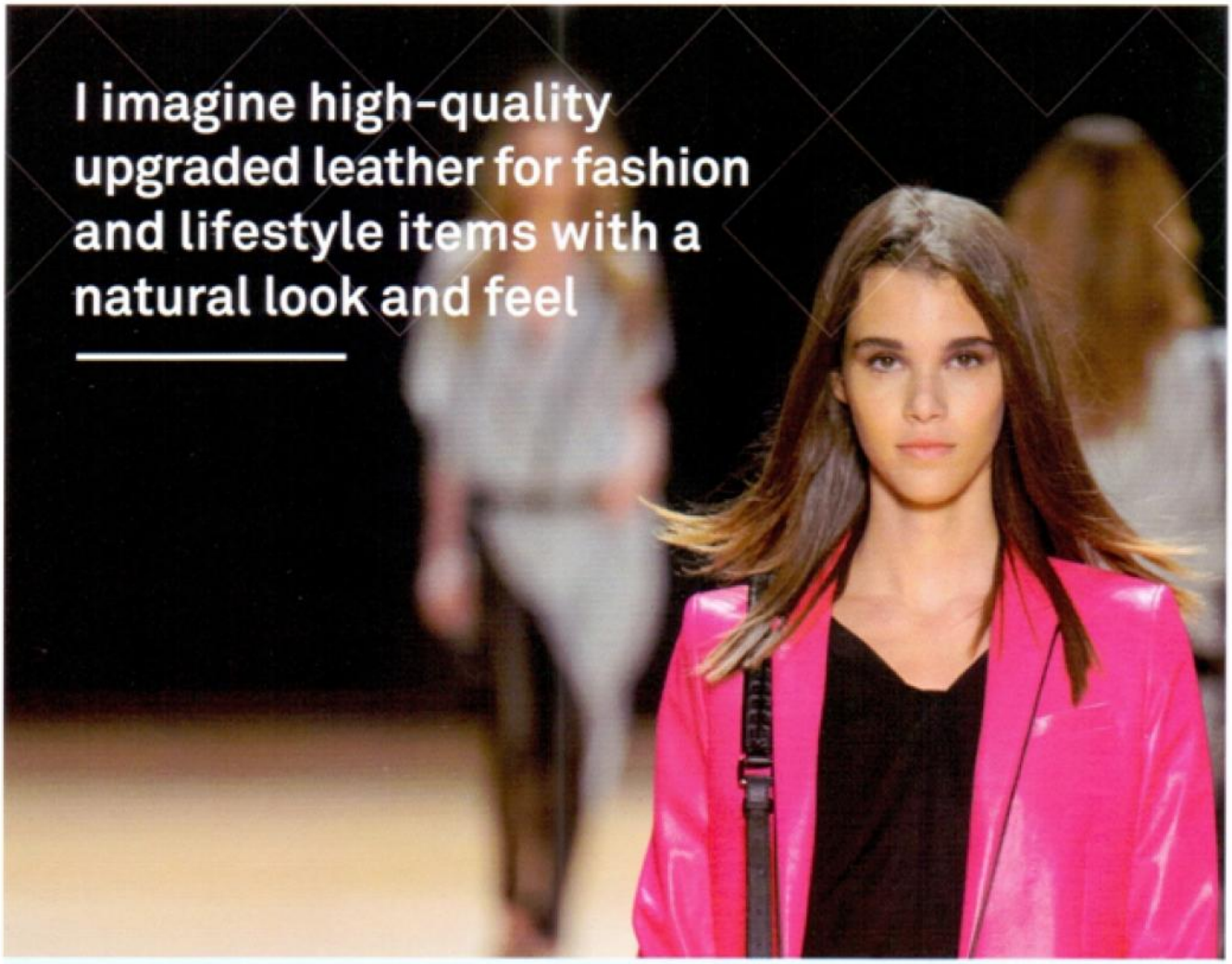


At Stahl, we love high-quality leather with a natural look and outstanding credentials. We want leather to be soft on the skin and both a pleasure to wear and to look at. To increase the availability of such leather we developed Stahl Easy-KAT: an easy-to-use, water-based leather upgrading product range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

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**CLOSURE NOTICE TO 850 STATE UNITS, SHOW-CAUSE TO 1200**

The Pollution Control Board, Assam (PCBA) has slapped show-cause notices to some 1,200 industries in the State which are operating without primary effluent treatment plants.

The PCBA regional office had carried out an inventorization of industries which are operating without functional primary effluent treatment plants. "These 1200 units were operating without effluent treatment plants in spite of sufficient time having been given to them, thereby violating the Board's directions as well as the Supreme Court's order," PCBA member secretary DN Das told this newspaper.

In two public notices issued on April 12, 2017 and August 9, 2017, the PCBA had directed all industrial units discharging effluents to install primary treatment plants and make them functional that year itself.

In the show-cause notices, the PCBA charged the units of violating the provisions of law in force, causing pollution to the environment.

"The units have been directed to file objection if any within fifteen days from the date of issue of the show-cause letters. Else, the PCBA will be forced to disconnect electricity and other essential services to the units," the official said.

PCBA teams have also begun an exercise to make an on-spot verification of the pollution control measures in these units. The show-cause notices were slapped after the PCBA served closure notice to around 850 such violators in the State.

Those who got the closure notices a month back includes defaulting industries, hotels, lodges and over 100 heath care units which have failed to meet the prescribed norms for removing the pollutants from the effluent before it is discharged. Most of them did not respond to the show-cause notice.

These industries were served show-cause notices last year. PCBA officials say the problem is more in the unorganized sector. In the judgement on a petition filed by Paryavaran Suraksha Samiti, the apex court had in 2017 directed industrial units across the country to set up effluent treatment plants within three months.
The court said industrial units without functional primary effluent treatment plants will not be allowed to run after the stipulated time. The court also directed states to build common effluent treatment plants within three years.

Civic bodies in states were directed to set up zero liquid discharge plants and include real-time monitoring of waste treatment within six months from then.

*(Assam Triune – 04/06/2019)*

**SHOP-OWNERS CANNOT CHARGE CONSUMERS FOR BAG**

The Chandigarh Consumer Commission recently ordered Bata India Ltd to pay Rs 9,000 in fine for charging Rs 3 from a customer for a paper bag to carry the shoebox.

Legal experts say the order is legally valid across the country and that stores cannot charge consumers additional charges for the bag if the product is purchased from the same store.

The forum's order came on a complaint filed by a consumer, Dinesh Prasad Raturi. Raturi told the consumer panel that he had purchased a pair of shoes on February 5 from the shoe store located in Sector 22D. The store charged Rs 402, which also included cost for the bag. Raturi contested that by charging him for the bag, Bata was also endorsing its brand on the bag which was not justified. Raturi sought a refund of Rs 3 and compensation for deficiency in services. The forum slammed Bata for charging an additional amount for the paper bag.

The forum ordered that a customer cannot be compelled to pay for the bag, and that it was a clear deficiency in service. The consumer forum ruled that it was the store's duty to provide a free bag to the customer who purchased their product.

Sagar Saxena, an advocate based in Delhi, said: "This consumer court's decision is legally valid across India. People can cite this order anywhere in the country and have the bag charges waived. The order establishes that even if the bag is environment-friendly, the retailer cannot charge an additional amount for the bag."

The consumer forum observed that if the companies are eager to protect the environment, they should provide free environment-friendly bags to the customers.

Nikhil Majithia, an advocate in Delhi, said: "After this order, the Ministry of Consumer Affairs should come out with guidelines

to protect consumer rights. Shopkeepers are not allowed to charge extra from consumers, as they brand the bag with their logo, so it becomes part of their advertising."

The Chandigarh commission in its decision directed Bata India Ltd to refund the cost of the bag (Rs 3) and litigation charges, i.e. Rs 1,000 along with Rs 3,000 as compensation to the customer for the mental agony caused by deficiency in services.

The forum also directed Bata to deposit Rs 5,000 in the legal aid account of the State Consumer Disputes Redressal Commission.

*(Punjab News Express – 18/04/2019)*

**TPCI SUGGESTS 6-POINT PLAN FOR EXPORTS**

In the wake of proliferating trade and investment restrictions and Indian exports showing signs of stagnation, the Trade Promotion Council of India has suggested six-point agenda which may be strategized for making India export competitive.

First one is identifying of new product basket which can easily find market compared to our global competitors as India has an inherent advantage. The emerging champion sectors could be; electrical, furniture and mattress and processed food.

"Processed food alone has huge scope after value addition and can fetch India 1000 USD plus export. It has been observed that the old sectors like textiles, RMG, leather, gems & jewellery, pharmacy & chemicals, hydrocarbons, etc have plateaued growth and further emphasis to these sectors will not make much difference to our exports," TPCI said in a statement. Another, it said, could be, external outreach and promotion of India products to new and emerging markets. India could utilize 80 trade promotion offices working on already accepted global norms for promotion of various products and brand from India.

Creating a national portal could be the third one for global trade inquires to be run/ managed with respective Export Promotion Councils which could handle queries on day to day basis. In addition, incentivization above basic target – encourage the performers by linking it with performance and target be it EPCs or any other body or organization.

The fifth is the availability of credit for the industry both in terms of intermediary and finished goods for exports. Logistic cost USD per km of road transport for India rank is 7, China 2.5, Bangladesh 3, Vietnam7 and Sri Lanka 3. The custom and port clearance takes 6 days for India, 1.5 days for China, 6 days for Vietnam and 3 days for Sri Lanka.

*(Deccan Herald – 10/06/2019)*

**FIVE LAKH EMPLOYMENT OPPORTUNITIES IN CALCUTTA LEATHER COMPLEX : MAMATA BANERJEE**

West Bengal Chief Minister Mamata Banerjee today inaugurated a project and laid the foundation stones of several others at the Calcutta Leather Complex (CLC) in Bantala, South 24 Parganas where multiple projects will lead to a big rise in employment opportunities (both direct and indirect combined), from the current 2 lakh to 5 lakh, in the near future.

Ms. Banerjee formally allotted 70 acres for 187 new tanneries from Kolkata, Kanpur and Chennai, taking the total number of tanneries that are operational or to become so in the near future, at CLC, to close to more than 790. This is the first phase.

In the second phase, the plan is to hand over plots to 250 leather goods units, according to a senior government official.

Out of the 187 tannery companies being allotted plots, 28 are big category, 97 are medium category and 62 are small category companies. Among these, 29 are from Kanpur, two from Chennai and 156 from Kolkata.

She also handed over no-objection certificates (NOC) to many tannery and leather goods units, so that they can become operational.

There were 220 tannery units and 50 leather goods units which had already been allotted plots but did not get NOCs as they did not have infrastructure for effluent discharge.

It needs to be mentioned in this connection that the government has decided to install four combined effluent treatment and sewage treatment plants to cater to the new as well as the old units. Presently, there are 385 tannery units and 40 leather goods units that are operational at Bantala. The Chief Minister inaugurated three facilities at CFC; Leather Goods Park (where leather goods units will be set up, with a substantial focus on export) Tanning Training Services Centre (with NABL-accredited testing lab, design centre, footwear lab, etc. to train tannery and leather goods sector employees, through the Government

Leather Teach College) handed over six buses for transporting workers within CLC.

Ms. Banerjee also laid the foundation stones of a Footwear Park (situated on 60 acres, to house more than 150 export-focussed units), a Common Facility Centre (CFC) for leather goods manufacturers (to support them with the latest technology, in order to enhance the capacity for export and domestic units) and the Micro Tanners' Hub (on 10 acres, to provide ready-to-use space for tanners for direct employment) Eco-friendly CFC for leather scrap burners (on 5 acres, to help them manufacture leather cards and boards) 7th and 8th common effluent treatment plants (CETP) (on 5 acres, to cater to the new tanneries).

Secured landfill sites for solid waste management (on 36 acres) Sewage Treatment Plant (one central STP, covering 50 acres, for environment friendly treatment of sewage and other waste water).

Dr. Amit Mitra, the Finance, Industry and Commerce, and Information Technology and e-Governance Minister had recently said that the government was spending Rs 540 crore for infrastructural development at CLC in order to turn the leather hub into the world's largest one.

Already several big companies from other states have set up their units at CLC and several more were handed over plots at the programme today. They are making a beeline for CLC because of the government's providing all necessary infrastructure and of following the latest rules and regulations, including environmental standards.

With all the projects announced today, the turnover at Calcutta Leather Complex is expected to climb from the present Rs 13,000 crore to Rs 27,000 crore in the next few years, according to the official mentioned earlier, and the export figure is expected to climb to touch Rs 35,000 crore.

*(UNI PC SJC RN)*

**DISTINGUISHED PAST PRESIDENT OF IULTCS PASSED AWAY**

**Dr Hubert Wachsmann**, one of the most distinguished past president of the International Union of Leather Technologists and Chemists Societies (IULTCS), has died in Switzerland. The team at World Leather sends its condolences to his wife and family. He was only a few weeks short of his ninetieth birthday.

Hubert Wachsmann's career began with Roser in Germany, from where he joined the leather department of Geigy plc in 1961. This took him into senior roles at Ciba-Geigy, from where he retired shortly before the company merged with Rohm and Stockhausen in 1996 to form Together For Leather, TFL.

In a statement confirming Dr Wachsmann's death, the executive board of TFL said : "He received numerous awards for his foresight and dedication to leather chemicals and the leather industry. We will honour his memory with gratitude."

At the IULTCS Congress in Philadelphia in 1989, the organization elected Dr Wachsmann as its president. He said that the growing importance of Asia to the global leather industry was very clear to him at that time. During his term as president, and then during his ongoing involvement with IULTCS as a still hard-working past-president, he said he was delighted "to direct attention towards the emergence of Asia as a whole" and to see national leather chemists' and technologists' societies across Asia become more and more influential in IULTCS affairs and committees.

Later, he became a consultant editor of World Leather and contributed advice and encouragement for many years. He also contributed to the magazine a number of influential articles, in which his deep knowledge of his chosen subject was always evident, as was his ability to explain his ideas clearly and succinctly.

In one of those articles, in 2004, he said presciently: "Scientific theory plays a central role in understanding the complex process of tanning. This is important. However, it does not explain how to produce very soft leather without weakening or loosening the grain, or how to keep the butt as flat as possible and still fill the empty flanks. Tanners still await helpful theories that can be applied to the problems that they permanently face."

*(From a reliable source)*

## ICC ORGANIZED MSME CONVENTION IN KOLKATA


**I**ndian Chamber of Commerce (ICC) organized its MSME Convention 2019 at Swabhumi, Kolkata on 11 – 12th July' 2019.

**Highlights :**

The programme focused on the sourcing of effective funds and financial stability along with the growth of the MSME sector. It spoke about the offerings by the insurance sectors to encourage the MSME sector. The Conference came up with the recommendations like the MSME sector has huge business potential and more so after the Budget 2019. The scope of the MSME sector is ever-increasing in India with 30% of India's GDP coming from MSME. This sector has flourished in India under the schemes introduced by the Government of India such as SPURTI and LBI. The need of the hour is digital marketing plans for the MSMEs and Art-based cluster development and entrepreneurship opportunity. Speakers felt that the organizations like Indian Chamber of Commerce can play as important role as facilitators of the MSMEs and help generate new ideas. Primarily, they should try to look at the issues that are affecting the fund's flow to MSME, and try to resolve it. The speakers highlighted the role of E-Commerce in the MSME value chain.

**Details :**

The 1st days programme consisted of 3 sessions :-

A. Inaugural Session
B. Technical Session – I : MSME Financial Connect
C. Technical Session – II : Scope of Vendor Linkages

**The Inaugural session** started with the Welcome Address by Mr. Tamal Ghoshal, Summit Chair & Executive Member-ICC Expert Committee on Real Estate & Infrastructure. Mr. Ajoy Bandyopadhyay, Director, MSME-DI & Mr. Mrityunjoy Mahapatra, MD & CEO, Syndicate Bank explained the main focus of this convention. The session concluded with the Vote of Thanks offered by Dr. Rajeev Singh, Director General, Indian Chambe of Commerce.

**The Technical Session – I** spoke about the source of effective funds and financial facilities for stability and growth of the MSME sector. It also spoke about the offerings by the insurance sectors to encourage the MSME sector with a secure and stable substance. Speakers of this session were Mrs. Jinsy Santosh, Regional Manager-Underwriting, SBI General Insurance, Mr. Sanjay Lamba, Regional Head, Exim Bank, Prof. Satyajit Dhar, Department of Business Administration, University of Kalyani. The speakers shared the success stories regarding the benefits caused by their organization to the MSMe sector along with their future plans of finance for further development of the MSME sector. The session concluded with a good Q/A.

**The Technical Session – II** was designed to highlight the scope of Public Private Partnership (PPP) mode with MSME sector. It spoke about the increasing scope of procurement in respect to the latest Government mandate (recent increased @5%) i.e. 25% of the total procurementof the Public & Government sector by MSME. This session also explored the future options of involving the MSMEs with the Government & Public sector. Speakers of this session were Mr. Partha Bhattacharya, VP

Procurement, CESC Ltd., Cmdre Bhaskar Sengupta, GM, GRSE, Ordinance Factory Board, Mr. S. K. Sen Asstt Director, MSME DI & Mr. Sujit Saha, DCMM, Kolkata Metro. The speakers highlighted the scope of vendors' linkages in terms of Public-Private Partnership model. It even spoke about how the public sectors are laying stress on reverse engineering to reduce the cost. The session concluded with a good Q/A followed by Lunch Break.

Post lunch session was only for the Vendor Linkages Programme. It was a B2B Round Table Networking session with MSMEs and the large scale Organizations. After this session the programme adjourned for the day.

The 2nd days programme consisted of 3 sessions :-

A. Technical Session – III : Empowering of Entrepreneurship – MSME & Startups
B. Technical Session – IV : Access of MSME to International Markets
C. Valedictory Session

**The Technical Session – III** emphasized on the immense opportunities for women in the MSME sector. It highlighted the series of special benefits lying for women in the sector. Some of those are as follow :-

1. 1.38 lakh projects have been set up by the women entrepreneurs.
2. 3% of the total procurement of the Public & Government sector reserved for women led MSME.
3. 25% & 35% subsidies for women entrepreneurs on project set up in urban and rural areas etc.

This session also discussed about ways to encourage more women to be a part of the fast growing MSME sector in days to come. Speakers of this session were Mrs. Manashi Roychowdhury, Co-Chairman, Techno India Group, Ms. Aishwarya Biswas, Founder & MD, Auli Lifestyle, Mr. Suresh Karmali, GM East, NSIC, Mr. Sibram Majhi, Dy. Chief Material Manager, Eastern Railway, Mr. K. P. Saha, MD, Senresya Technologies. The session concluded with Q/A to & fro audience.

**The Technical Session – IV** explained in details regarding the access of the International Market by Indian MSME sector. It spoke about the benefits of why the MSME sector should look at the International Market along with the major factors involved like information about the International demand, the rules involved and the quality standard requirement of different countries etc. Moreover this session also discussed the Government support provided to the MSMEs in this regards and ways to avail them. Speakers of this session were Mr. Keiichi Higuchi, President, Kawasaki RikusoTransportation Co. Ltd., Mr. Debashis Mazumder, Asstt Manager, Strategic Solution Group, Saled Dept. Global Business Divn.,Fujisoft Incorporation, Dr. K. Rangarajan, Head, MSME studies, IIFT Kolkata, Mr. Rabindra Kumar, Head, Bulk Procurement, TATA Steel, Mr. Y. Sudheer, DGM & rm East, EGGC.

**The Valedictory Session** presided by Summit Chair Mr. Tamal Ghoshal. He welcomed His Excellency Mr. Masayuki Taga, Consulate General of Japan and Mr. Utpal Kumar Acharya, Joint DGFT. In his address His Excellency Mr. Masayuki Taga expressed his heartfelt thanks to the organizers for inviting him in the programme. He briefly explained the scope of businesses, especially MSME sectors between India and Japan. He also briefly described the current status of the existing business relation between Japan and India. Mr. Acharya shortly described the scope of foreign trade for MSME sectors. Mr. Ghosal then summed up the whole programme and declared conclusion of the conference followed by Lunch.


# THE 21ST INTERNATIONAL SHOES & LEATHER EXHIBITION – VIETNAM : A REPORT


The 21st International Shoes & Leather Exhibition (Shoes & Leather – Vietnam) incorporating "The International Footwear & Leather Product Exhibition – Vietnam (IFLE – Vietnam)" and "Vietnam International Exhibition on Sewing Machinery (SewTech – Vietnam)" was held this year from 10 – 12th July' 2019 at Saigon Exhibition and Convention Center (SECC), HCMC, Vietnam.

**This** is the largest and most influential international trade fair for shoes and leather goods in the whole ASEAN countries. The exhibition focuses on the presentation of Leather, Leather Chemicals, Machinery, Equipments and materials for the production of footwear and leather goods. But it also provides a perfect platform to manufacturers and distributors for introducing their new collections and finished products. The Shoes & Leather fair was accompanied by an extensive supporting program including seminars and a shoe design competition also.

## Event Profile

Over the years, International Footwear & Leather Products Exhibition - Vietnam (IFLE - VIETNAM) has not only grown numerically, but also in terms of quality, fashion & style in VIETNAM as well as World. Being the supreme and foremost international trade fair for footwear and leather, this event continuously offers a great opportunity for buyer-seller meet and discussion between the manufacturers and traders in the whole of Asia. The exhibition is all about the latest collections of mostly the Asian manufacturers. Profile of the exhibitors were mainly from classic leather goods, small leather goods, handbags and briefcases, fashionable handbags, footwear, travelwere, leather garments, fashion accessories, lifestyle products, leather accessories, handbags accessories, footwear accessories and footwear material. Especially branded products of the middle and high-end category were in the focus. The show's audience mainly consists of professional visitors like traders, importers, designers and interested purchasers. They were coming from the field of classic leather goods, small leather goods, handbags and briefcases, fashionable handbags, footwear, travelwere, leather garments, fashion accessories, lifestyle products, leather accessories, handbags accessories, footwear accessories and footwear material etc.

## ILTA Participation

Mr. Susanta Mallick, General Secretary of Indian Leather Technologists' Association who attended the fair, participated in the seminars & symposiums during the 3 days event simultaneously.

However, the 22nd IFLE – Vietnam is proposed to be held in July' 2020 in Ho Chi Minh City.


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# THE CLIMATE AND THE ANIMALS IN ANCIENT INDIA

Dr. Buddhadeb Chattopadhyay

Former Principal of Govt. College of Engineering & Leather Technology, Kolkata
& Principal, MCKV Institute of Engineering, Liluah, Howrah, W. B.

Before the onset of Pleistocene epoch, which is about 2.0 Million years ago, when the 'Continental Drift' ceased, Geological formation of India took place. The main land of India lied between lat 0 degree North and little above 37 degree lat north. So, the land mass remaining closer to Equator (0 degree Lat.) received most solar energy and is hot (tropical) in climate. That caused Himalayas to be covered with ice during the Pleistocene Ice age, favouring human to enter India and make their homes.

Besides the position in terms of latitude, the second factor that decides the climate temperature is the height above the mean sea level (MSL). Higher the place is, lower is the air density and so cooler is the place. This is the thumb rule. The Himalayas and the associated Karakoram ranges are the highest mountain ranges in the world and so they have permanent ice sheets on them. The climate throughout the year in those areas is Alpine.

The great geological pushes that raised the Himalayas are also responsible for making the rest of the country warmer by 1.5 to 3.0 degree Celsius by blocking the southward path of winds blowing from colder regions of the North.

The fact that the southern peninsula has large oceanic expense on both sides; the Arabian Sea at the west and the Bay of Bengal at the east, helps greatly to moderate the climate. Thus southern India didn't experience extreme climates with severe change of the ambient temperature.

The other responsible factor for climate besides the temperature is the precipitation or the rain fall. This has to be taken together all forms of precipitations which include rain, mist, sleet and hail. The main two variables that govern the rain fall are the developed temperature over the land mass and that over the Arabian Sea and the Bay of Bengal.

Because the great mountain range barrier – the Himalayan range was formed long before the beginning of Pleistocene epoch, there can be little doubt that the monsoon regime as we know now, must have been the same minimum 2.0 Million years ago. During the Ice age, with the fall of sea level there was surely a diminishing rain fall which was resurrected again during the Holocene epoch when the warmth returned.

Life appeared before 4.0 to 2.5 Billion years ago by sheer chance event in the form of primitive bacteria, algae from the marine water. Marine life gradually evolved during Cambrian times (about 570 Million years ago). The earliest land plants and insects were found fossilized in Silurian rocks dated back to 348 to 408 Million years ago. The ferns and mosses appeared in the Devonian period of about 408 to 360 Million years ago. The lower forms of flowering plants appeared only during Cretacious epoch at the beginning of 144 Million years ago.

In the oldest lower Gondwana rocks of India fossils of ferns, while in upper one contained fossils of conifers. The earliest grasses came in Eocene period (55 to 38 Million years ago).

Within 2.0 Million years of Pleistocene epoch, the vegetation growing over much of the land mass must have altered the characters as Ice age and Interglacial followed in alternative pattern. During the Ice age a great area of Himalayas were fully covered with ice causing the plains and the peninsula to be enough dry thereby. This should have caused a desiccation. The mobile and the sand-dunes that are found now only in the North-Western part of Rajasthan and adjoining areas were far more extensive in the Ice age. This must have impacted similarly up to the western face of Aravallis and range beyond Jaipur well into Haryana. These are now transformed into stationery mounds.

The vegetation that existed before Human came into existence and begun to intervene by the way of cutting the forest or clear the land for cultivation or to set his cattle to graze is often termed as Natural vegetation. The richness and the kinds of the

canopy are depended on the then natural conditions like, solar radiations, rainfalls etc. Somewhere evergreen forest, while in other places depending on the rain fall either wet deciduous or tropical dry deciduous forests were formed in ancient India at the dawn of Holocene, 10,000 years ago. In Bengal and coastal Orissa there must have been wet evergreen forests. The tropical deciduous forests covering a large part of Uttar Pradesh and western Bihar probably could not be separated from the moist deciduous forest spread in north, east and south. It is quite understandable, that the areas covered under dense canopy of evergreen forests must have a better water retention (and of course, naturally occurring wetlands) and thus heavier rain falls making the forest more dense and wet.

Thus before the cultivation and grazing began to intervene the Natural vegetation, some of which stand now as topical throne forest with stunned scattered trees, were at least dry deciduous forest. Such forests must have covered most of the Indus basin and broad dry belt next to Western Ghats. This explains why elephants once freely roamed in the Indus basin. The remains of the elephants were not only found in the Indus basin, but also, before 5,000 BC in Mehrgarh in the plain below the Bolan Pass, south of Quetta.

During the Holocene, when the present climate had become established, human must have found it suitable to live in dense forests, except in Indus basin, the Thar Desert of Rajasthan and the middle bed of the peninsula.

Fossils of variety of animals, which were living in the various geological ages, were found in India. India was also a home of the mighty dinosaurs or the giant reptiles. The dinosaurs, the biggest land animals that the nature have ever produced, appeared in the Triassic period, beginning 248 Millions of years ago, and became completely extinct by the end of the Cretaceous period, 65 Millions of years ago. The fossils of dinosaurs were found in the Gondwana rocks of India. Even prior to disappearance of the mighty dinosaurs, the earliest species of birds and mammals had appeared in India in the Jurassic times in the beginning of 213 Million of years ago.

The species of mammals multiplies in time. In India during the late Tertiary and Pleistocene, there was as many as seventeen species of elephants. Except one, all were extinct now and there is only one more species in the world, the African elephant. The hippopotamus, now found only in Africa, were not only available in both Gangetic basin but also in the Narmada valley during Pleistocene epoch. There were species of wild horse too, but now completely extinct. The largest bird Ostrich about 8,000 years ago thrived in India. Now completely extinct as natural habitat.

The earlier extinction of various animal species could be due to primarily three reasons which are a) inability to adapt to the alternate change of cold and warmth due to alternate appearance of Ice age and interglacial, b) the large scale volcanic eruption in various parts of ancient India and last but not the least, c) severe earthquakes resulting by the frequent frictions of Indian tectonic plate with Eurasian tectonic plates. These three together might had impacted dreadful havoc on the lives of the animals belonging to earlier geological epochs.

The appearance of Anatomically Modern Man (AMM), especially since the Neolithic Revolutions, the man himself and the animals that they had domesticated had become one of the major source of extinction of animals. The extension of cultivation and grazing lands at the expenses of Natural vegetation had correspondingly reduced or destroyed many animal species. The Lions, once the Lord of the forest were available as natural habitat in India, now confined within the small territory of Gir reserve forest. The hunting leopard or *cheetah*s are no more a natural habitat of India. It did not breed in captivity. Tigers available throughout the forests of India are now endangered species. The rhinoceros, once available throughout India in grazing ecosystems are available in North-eastern part of the country and the North of Bengal. The elephants' domains have now been shrunk to few pockets of forests of Bengal, North-east India, Karnataka and Kerala etc.

What human have promoted is the domesticated animals like, bovines, ovine, horse, camel, pigs, poultry, dogs, cats etc. Mankind had acquired awesome intellect and power to control over animal kingdom. At the same time, the human has caused dangers from an utter degradation of nature (both animal and plant kingdoms) to humanity, that itself is under scientific audit. The important part of human civilization now should call for the endeavor to protect whatever remains of nature is left behind now

# 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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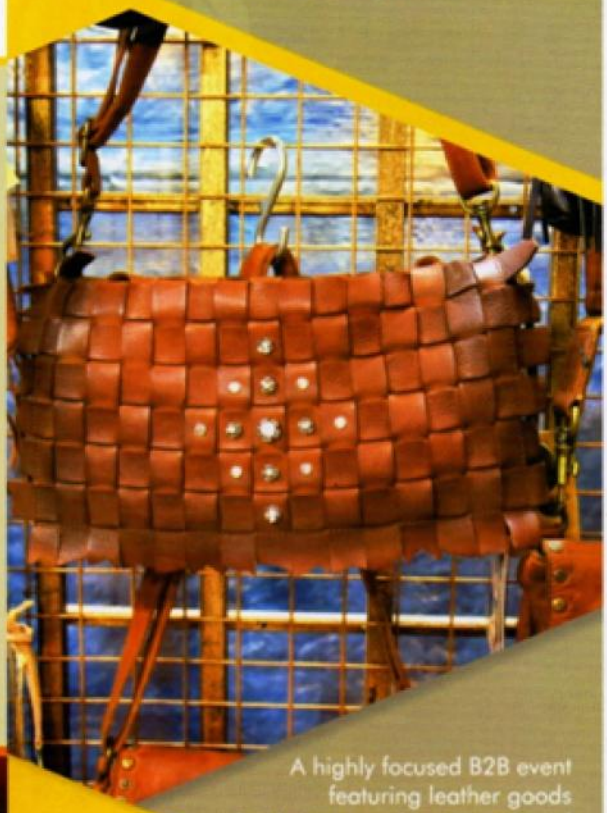

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# ANALYSIS OF LEATHER

P. K. Sarkar

## (B) VEGETABLE-TANNED LEATHER.

**(1) Method of Sampling :**

1. The same process is followed as in the case of chrome leather.

**(2) Method of Chemical Analysis**

(*i*) *Moisture*

The same procedure as in the case of chrome-tanned leather excepting that 20 gms. is to be taken.

(*ii*) *Oils and fats*

The same procedure as in the case of chrome leathers.

(*iii*) *Total Ash*

The same procedure as in the case of chrome-tanned leather.

(*iv*) *Water Soluble Matters*

The moisture-free leather, after the extraction of fat by petrol ether, is freed from solvent by spreading out on a clean surface and leaving exposed to air. It is then transferred to a Proctor's extractor, covered with distilled water at the temperature of the laboratory and left to stand overnight. Next morning the extraction is carried out at 45°-50°C by a process of continuous extraction, so that 1 litre is obtained in 3-3½ hrs. The extract is filtered and after rejection of the first 150 cc., 50 cc. is evaporated to a constant weight in a tared basin. From this the percentage of water soluble matter is calculated.

(*v*) *Soluble Ash*

The residue from (iv) is ashed to a constant weight and its percentage is calculated on the weight of the leather.

(*vi*) *Nitrogen or Hide Substance* :

1.5 gm. of the leather sample is weighed out in a watch glass and transferred to a kjeldahl flask, 15-25 cc. of strong sulphuric acid is added to it and the flask heated over a very small flame until the leather pieces are dissolved

The contents of the flask are then allowed to cool and 10 gms. of dried powdered $K_2SO_4$ and 0.5 gm. of anhydrous $CuSO_4$ added, after which the heating is continued till a clean and nearly colourless liquid is obtained. The flask and the contents are then allowed to cool. Its contents are then poured out into a conical flask and rinsed with distilled water. Glass beads are added to the flask to prevent bumping. 1 cc. of 1 percent phenolphthalin solution is then added and the contents of the flask are then made alkaline with excess of NaOH solution taking care that during addition of NaOH solution no ammonia escapes. The alkaline solution is then distilled in 100 cc. N/5, HCl or $H_2SO_4$. The distillate is made up to 500 cc. and 50 cc. thereof is titrated with N/5 NaOH solution. The number of cc. of N/5 NaOH solution required shows the excess of acid after neutralisation of ammonia evolved during the process and thus the quantity of the acid neutralised by $NH_3$ can be determined.

1 cc. N/5 acid thus required ≡ 2.8 mgm. $N_2$ or 15.72 mgm. hide substance.

Alternative method : To a 0.2 gm. of prepared leather sample in a kjeldahl flask are added 5.0 cc. of conc. $H_2SO_4$, 2 gm. of $Na_2SO_4$ and two Selenium bead and the sample is allowed to digest on the electric heater for one hour. The digested sample is allowed to cool for 5 minutes, the flask being half-filled with distilled water before the digested sample has solidified. A saturated solution of NaOH (about 15 cc.) is then carefully added without shaking until the solution is alkaline to phenophthalin which is added before the addition of NaOH. 1 or 2 cc. of 1 percent phenolppthalin is added in this case. The ammonia evolved is distilled into 25 cc. of a 4 percent Boric acid solution containing 10 drops of methyl red. The solution is then titrated with a standard hydrochloric acid solution till the colour of the solution exactly matches to that of the blank test containing 25 cc. of 4 percent Boric acid, 10 drops of methyl red and sufficient water to make the volume equal to the volume of the last sample :

$$\text{Percentage Hide substance} = \text{cc. HCl} \times \text{Normality of HCl} \times 14/1000 \times 5.62 \times 100/0.2$$
$$= \text{cc. of N/1-HCl} \times 39.34$$

(vii) *Combined Tannin* :

The sum total of the percentages of moisture, insoluble ash, fat, water soluble matter and hide substance is subtracted from 100 and the result is combined tannin.

(viii) *Degree of Tannage* :

The amount of combined tannin as obtained above is expressed for every 100 parts of hide substance and the result is the degree of tannage.

(ix) *Invert Sugar* :

200 cc. of leather extract as obtained in No. (iv) is placed in a 500 cc. flask and 25 cc. of a saturated solution of basic lead acetate is added, well stirred and allowed to stand for a quarter of an hour. The solution is then filtered and the filtrate treated with solid, anhydrous $Na_2CO_3$. This is to precipitate the excess of lead as carbonate and is added till the precipitation is being formed. The liquid is again filtered and made neutral with HCl. Non-reducing sugars are next inverted by heating 100 cc. of the filtrate (equivalent to 100 cc. of the original solution) with 8-10cc. of HCl on the water bath for about an hour, using a reflux condenser to avoid evaporation. After invertion the liquid is cooled down and neutralised with a strong solution of caustic soda. The neutralised liquid then is added to Fehling's solution No. 1 and No. 2 and heated to the boil. It is then heated on the water bath for 30 minutes at the end of which time the $Cu_2O$ formed is filtered through a weighed Gooch crucible containing a thin layer of asbestos. It is washed first with hot water and then alcohol and then finally dried in the steam oven and made to a constant weight. The percentage of glucose is then determined by the use of Munson and Walker's table.

*Preparation of Fehling's Solution* :

(a) 34.64 gms. of $CuSO_4$, $5H_2O$ is dissolved in distilled water and diluted to 500 cc. It is then filltered and kept in a stoppered bottle. (b) 173 gms. of Rochelle salt (Sodium Potassium Tartarate) and 50 gms. of NaOH pure by alcohol is dissolved in water and diluted to 500 cc. The solution is then allowed to stand for two days, filtered and kept in a stoppered bottle. The above two solutions are mixed in equal proportions by volume just before use.

(*x*) *Acidity Proctor Searle Method* :

2gms. of the prepared sample is weighed in a procelain basin, 40 cc. of a solution of N/10 $Na_2CO_3$ added and the mixture evaporated to dryness on a water bath. After heating for 10 minutes for 105°C. and gently charring over an asbestos gauze the basin is placed on a clay-pipe triangle and the whole is strongly ignited. When cooled the residue is moistened with 25 cc. of hot water, the carbonaceous matter is broken up with a glass rod and the temperature raised almost to boiling point. The mixutre is then filtered into a covered beaker and the residue thoroughly washed. The filter paper and contents are then ignited to burn off all the carbon. N/10 $H_2SO_4$ equivalent in quantity to the original 40 cc. of N/10 $Na_2CO_3$ used is added to the residual ash and the mixture raised to boiling point, the basin being covered with a watch glass. The solution so obtained is added to the filtrate in the covered beaker as mentioned above and the basin is carefully washed into the beaker. The resulting solution in the beaker is then boiled for 15 minutes, allowed to cool and 3 drops of 1 per cent methyl orange is added. In cases where there is an excess of acid, they are titrated with N/10 NaOH and calculated as free $H_2SO_4$.

(xi) *Epsom Salt* :

The ash obtained from 5 gms. of leathers as in No. iii is moistened with water, 15 cc. conc. HCl added, washed into a beaker, diluted to 15-17 cc. 2-3 drops of conc. $HNO_3$ added, boiled gently for a few minutes. Ammonia ($NH_4OH$) nearly 1:1 added slowly with constant stirring until nearly neutral but still slightly acid without filtering off the insoluble matters, then dilute ammonia nearly 4 : 1 is added in slight excess until precipitation occurs. It is boiled for a few minutes, filtered and the precipitate washed thoroughly with hot water. The filtrate is evaporated to 175-200 cc.made just alkaline with ammonia, boiled gently, 10 cc. of a saturated solution of ammonium oxalate added with constant st irring, covered and allowed, to stand for two hours in a steam bath. The solution as well as the precipitate are washed quantitatively into a 250 cc. flask, cooled to 20-25 cc. filled up to the mark with distilled water, mixed thoroughly and filtered through quantitative filterpaper making sure that the filtrate is absolutely clear. An aliquot portion equivalent to 2 gms. of the prepared leather sample is then pipetted, diluted to about 150 cc. made slightly acid with HCl using methyl orange, cooled and is added about 5 cc. (excess) of clear saturated solution of $Na_2H\ PO_4$, stirred vigorously and a few drops of ammonia added until precipitation starts and allowed to stand for 15 minutes. 5 cc. of concentrated ammonia is then added with stirring, covered and allowed to stand overnight at room temperature. Next morning it is filtered through a tared well prepared Gooch crucible, the precipitate is washed, freed from chloride with a solution containing 1 part conc. $NH_4OH$ and 9 parts of water. The crucible is at first gently ignited, then covered and ignited intensely for 20-30 minutes until constant in weight. From the difference in the weights of the crucible the weight of epsom salt as $MgSO_4,\ 7H_2O$ is calculated by multiplying with the factor 2.22 and the result is expressed as percentage of the weight of the prapered sample originally taken.

**3. Methods of physical tests** :

(i) *Cracking of the grain* :

Same procedure as in the case of chrome leather.

(ii) *Tightness of the grain* :

Same precedure as in the case of chrome leather.

(iii) *Tearing strength* :

Same procedure as in the case of chrome leather.

(iv) *Tensile strength* :

Same procedure as in the case of chrome leather.

(v) *Tackiness* :

The leather is brought to a uniform temperature of 120°+2°F. A piece of bleached fine Muslin is spread on the coated surface and held under a pressure of 1 lb./sq. inch for 5 minutes at this temperature. The fine Muslin is stripped off and any tackiness noted.

**Note** : The test is for upholstery and patent leathers only.

(vi) *Crocking*

A piece of bleached but not starched white cotton print cloth is rubbed over the surface of the leather, being applied with an approximate pressure of 21 lbs. and rubbed back and forth 20 times at the rate of 1 second/double stroke, each stroke being 4 inches long. The test is made with both the leather and the cloth, air dired and again when the cloth is so wetted as to contain 75 percent—100 percent moisture.

**Note** : This test is also for upholstery and patent leathers only.

## C. OIL TANNED LEATHER

**(1) Method of sampling**

Flesh splits of goat and sheep skins of good quality, free from grain and flesh defects are used.

**(2) Method of chemical analysis**

(i) *Moisture*

20 gms. of the sample is accurately weighed in a tared flat-bottomed procelain basin, dried in the steam oven to a constant weight and the percentage of moisture calculated.

(ii) *Oils and fats*

Same procedure as done before.

(iii) *Water soluble matters*

Same procedure.

(iv) *Soluble Ash*

The residue from (iii) is ashed to a constant weight and the percentage is calculated.

(v) *Total Ash*

Same Procedure.

(vi) *Nitrogen and Hide Substance*

Same procedure.

(vii) *Non-nitrogenous organic matters*

The sum total of the percentages of moisture, insoluble ash, fat, water soluble, and hide substance is subtracted from 100.

(viii) *Oil combined with protein*

The sum total of the percentages of moisture, total ash and hide substance is subtracted from 100.

### D FORMALDEHYDE TANNED LEATHER

10 gms. of leather is taken in a distilling flask and suitable quantity of 2N $H_2SO_4$ is added to it. The contents are then distilled with steam and the distillate collected in a suitable flask. The Formaldehyde in the distillate is then determined by precipitating the distillate with Dimedone (3.5 dimethyl cyclohexane + 1.3 dione) according to Bowest Kentoh as described below. A suitable aliquot of the distillate containing not more than 25 mgms. Formaldehyde is diluted to 100 cc. 2 drops Bromophenol Blue indicator added and the solution neutralised with acid or alkali until just purple. 50 cc. N/1 Sodium acetate and 25 cc. N/1 HCl are then added. This stabilises the range of pH 4.5-4.6 which is the most favourable range for the precipitation. An excess of saturated Dimedone solution is then added (a saturated solution contains 0.4 gm. of Dimedone per 100 cc. and approximately 70 cc. is required for every 25 mgm. CHOH). The precipitate is formed slowly and is left for 18 hours before filtering through a weighed Gooch crucible. Precipitate is washed with water and dried at 60°C. The weight of the precipitate multiplied by 0.1027 gives the amount of formaldehyde present in the aliquot.

**(2) Method of physical testing**

(i) *Shrinkage temperature*

The apparatus consists of a 2 litre beaker fitted with a stirrer and a thermometer reading to 1/10th of a degree. The sample is fastened to a clip, which in turn is attached to a glass rod, dipping into the beaker and bent at the lower end. The free end of the leather strip is held in a Nickel clip attached to a 40 S.W.G. copper wire. This wire passes over an aluminium pulley, then over a second pulley to which is attached a pointer arm and then down to a scale pan which

eaxctly balances the immersed weight on the clip. The arm is exactly 10 times the radius of the pulley and moves over a circular scale divided in mm. The whole of the apparatus bearing the leather, pullies and stand is independently mounted to eliminate vibration from the stirrer. Absence of clip in the pointer arm ir ensured by winding the wire completely round the second pulley. The sample of leather (11 cm. × 1cm.) is cut with a sharp knife. Two marks are made 10 cm. apart and the sample fastened to the screw clips. On immersion, a small correcting weight is placed on the pan to compensate for the weight of the leather. The scale arm is then adjusted to 0 and 50 gm. weight and then placed on the pan.

The stirrer is stirred and the apparatus left for half an hour or so to ensure that the leather is at steady state. Heat is then applied and the temperature is allowed to rise about 2.5° per minute. Readings from the scale are taken at suitable intervals of time. As the shrinkage temperature is approached the rate of heating is slowed down.

(ii) *Water absorption*

A disc of leather is cut with a circular knife of 3 cm. diameter, weighed and soaked in 25 cc. water at 75°F in a tared covered disc for 30 minutes. The disc is withdrawn with forceps, shaking adhering water back into disc and not blotting the piece. The watery solution is evaporated to dryness and the residue weighed. The disc is put into a second disc with 25 cc. of water at 70°F and allowed to stand for 23½ hours, removed and weighed again. The watery solution is evaporated and the dry residue is weighed. The weight of the first residue is added to total weight of leather after 30 minutes ; the initial weight of the disc subtracted, then multiplied by 100 and divided by initial weight to get percentage of water absorbed in minute. The weights of both residues are added to that of disc after 24 hours in water ; the initial weight subtracted, then multiplied by 100 and divided by initial weight to get percentage of water absorbed in 24 hours.

(iii) *Sinking test*

The sample of leather (11 cm. × 1 cm. cut with a knife) is prepared first ; water is taken in a 2 litre beaker, the sample is thrown into it and then the time taken for the sample to sink completely to the bottom of the beaker is noted. If there are present any uncombined oil inside the leather, it will be lighter in weight and will take longer time to sink.

*Tentative specifications for various classes of leather manufactured from Indian hides and skins* :

**(A) Chrome tanned Box and willow kips and sides for shoe uppers**

(i) *Moisture*

The actual moisture content should be determined and showed in the report of analysis. Result of other contents shall be calculated on 15 percent moisture basis whatever the actual moisture may be.

(ii) *Total Ash :* Not more than 2 percent above the chromium content.
(iii) $Cr_2O_3$ : Minimum $2\frac{1}{2}$ percent and maximum 6 percent.
(iv) *Fat :* Must be between 2.5 percent to 6 percent.
(v) *pH of water extract :* Must lie between 4 and 6.
(vi) The grain shall be tight as much as possible.
(vii) The grain shall not crack on double folding.
(viii) *Tensile strength :* It should not be less than 653 lbs./sq. inch.
(ix) *Tearing strength :* The leather shall offer reasonable resistance to tearing pull and shall be near about 3 lbs. to 5 lbs.

**(B) Glace kid for shoe uppers :**

(i) *Moisture :* Same as (A)
(ii) *Total Ash :* Same as (A)
(iii) $Cr_2O_3$ : Same as (A)
(iv) *Fat :* Must be 2 percent to 8 percent.
(v) *pH of water extract* : Same as (A).
(vi) Same as (A).
(vii) Same as (A).
(viii) *Tensile strength :* The average should be near about 5,075 lbs./sq. inch.
(ix) *Tearing strength* : The leather shall offer reasonable resistance to tearing pull and shall be near about 3-4 lbs.

**(C) Upholstery leather :**

(i) Thickness should be uniform throughout the height and it should be 1.3—1.5 mm.
(ii) *Moisture* : Same as (A).
(iii) *Fat* : Must be between 8 percent to 18 percent.
(iv) *pH of water extract* : not less than 3.5.
(v) *Feel* : Should be soft and resistant.
(vi) The grain shall not crack on double folding.
(vii) *Stretch* : It should not exceed 30 percent at the breaking load.
(viii) *Tensile strength* : The breaking strength to break 1 inch wide strap shall be not less than 100 lbs.
(ix) *Tackiness* : Shall not become tacky or sticky.
(x) *Tearing strength* : Shall offer reasonable resistance to tearing pull.

**(D) Chrome Lace Leather**

(i) *Moisture* : Same as above.
(ii) *Total Ash* : 4 percent—6 percent.
(iii) *Fat :* 14 percent—18 percent.
(iv) $Cr_2O_3$ : 2.5 percent—4 percent.
(v) *Strain* : Shall be required to stand a test strain of 200 lbs, the centre portion of the lace measuring 2 ft. in length with 3/8 inch in width and 1/4 inch in thickness.

(vi) The laces should be conditioned in an atmosphere of 70 percent—75 percent relative humidity for 48 hours, before analysis is undertaken.

**(E) Russet Leather :**

(i) Same as above.
(ii) *Total Ash* : not more than 3 percent.
(iii) *Fat :* 20 percent—36 percent.
(iv) *Water solubles* : not more than 18 percent.
(v) *pH of water extract* : Not less than 3.3.
(vi) *Degree of Tannage* : 40—70.
(vii) The grain shall not crack on double folding.
(viii) *Stretch* : On an average, it should not be more than 20 percent at a load of 2,500 lbs./sq. inch.
(ix) *Tensile strength* : On an average, it should not be less than 4,000 lbs./sq. inch, and shall not be less than 3,500 lbs./sq. inch for any simple specimen.

**(F) Sole Leather :**

(i) *Moisture* : Same
(ii) *Fat*-not more than 3.4 percent.
(iii) *Hide substance* : 42 percent—50 percent.
(iv) *Combined tannin* : 25 percent—36 percent.
(v) *Insoluble Ash* : 0 percent—0.5 percent.
(vi) *Degree of tannage* : 55—80.
(vii) *Water soluble matter* : Not more than 12.5 percent.
(viii) *Water soluble matter per unit of hide substance* : Less than 0.3 percent.
(ix) $MgSO_4$ : Not more than 1 percent.
(xii) $Cr_2O_3$ *content* : 1.5 percent—2 percent.
(xi) *Acidity* (Proctor searle method) : Not more than 0.8 percent in case of vegetable tanned leather.
(xii) The leather shall not crack on double folding.
(xiii) *Stretch* : Average stretch shall be between 10 and 14 percent in case of vegetable tanned leather and 20 and 25 percent in case of chrome tanned leather and 14,20 lbs./sq. inch cross section.
(xiv) *Tensile strength* : On an average it shall not be less than 2,700 lb./sq. inch in case of vegetable tanned leather and not less than 14,20 lbs./sq. inch in case of chrome tanned leather.
(xv) *Breaking stress* : The average lbs. required to break 1 inch width shall be not less than 4330 in case of vegetable tanned leather and not less than 17,30 lbs./sq. inch in case of chrome tanned leather.
(xvi) *Stitch tear* : The average shall be about 540 lbs. in case of vegetable tanned leather and about 300 lbs. in case of chrome tanned leather.

**(G) Belting Leather :**

(i) *Moisture* : The actual moisture content shall be determined and shown in the report of analysis. Result of other contents shall be calculated as parts per 85 parts of fat free leather.
(ii) *Total Ash* : Not more than 2 percent.
(iii) *Soluble Ash* : Not more than 1 percent.
(iv) *Hide substance* : 35 percent— 50 percent in vegetable tanned leather and 60 percent — 70 percent in chrome leather.
(v) *Water soluble matter* : Not more than 14 percent in vegetable tanned leather.
(vi) *Invert sugar* : Not more than 2.25 percent.
(vii) $MgSO_4$ : Not more than 0.75. percent.
(viii) *Acidity*—(Proctor Searle Method) : Not more than 0.70 percent in vegetable tanned leather.
(ix) $Cr_2O_3$ : 2.5 percent — 6 percent.
(x) The leather shall not crack on double folding.
(xi) *Stretch :* about 14 percent lengthwise/19 percent cross-section = in case of V. T. Leather ; 21 percent lengthwise/31 percent cross-section = in case of veg./chrome combination ; and 23 percent lengthwise /47 percent cross-section = in case of chrome tanned leather at a stress of 2,500 lbs./sq. inch.
(xii) *Tensile strength* : as an average of all specimens tested it shall be 4,300 lbs./sq. inch cross-section/5,045 lbs./sq. inch lengthwise = in case of V. T. leather ; 3,400 lbs./sq. inch crossection/3,500 lbs./sq. inch lengthwise = in case of veg./chrome combination and 2,800 lbs./sq. inch cross-section/3,400 lbs./sq. inch lengthwise = in case of chrome leathers.
(xiii) *Breaking stress* : The stretch at breaking point shall be 28 percent lengthwise /33 percent cross-section = in case of veg tanned leather ; 31 percent lengthwise/43 percent cross-section = in case of veg. chrome combination and 36 percent lengthwise/56 percent cross-section = in case of chrome tanned leather.

**(H) Harness Leather :**

(i) *Moisture* : Same
(iii) *Total Ash* : Not more than 1 percent.
(iii) *Soluble Ash* : Not more than 0.75 percent.
(iv) *Fat* : 3 percent — 6 percent.
(v) *Water soluble matter* : Shall not exceed 10 percent.
(vi) *pH of water extract* : 3.5—4.5.
(vii) *Degree of tannage* : 65—90.
(viii) The grain should be tight as much as possible.
(ix) The leather shall not crack on double folding.

(x) *Apparent density* : Not more than 1 percent.
(xi) *Tensile strength* : On an average it shall not be less than 5,200 lbs. /sq. inch.
(xii) *Elongation* : Elongation at the breaking load shall not exceed 10 percent.

**(I) Hydraulic Leather :**

(i) *Moisture* : Same
(ii) *Total Ash* : Not more than 1 percent.
(iii) *Soluble Ash* : Not more than 0.75 percent.
(iv) *Water soluble matter* : Not more than 15 percent.
(v) *pH of water extract* : Not less than 2.5 percent.
(vi) The leather shall not crack on double folding.
(vii) *Water absorption* : It shall be not more than 5 percent after 30 minutes, not more than 7.5 percent after 2 hours and not more than 10 percent after 24 hours.
(viii) *Shrinkage in hot water* : When immersed in hot water at 70°C for 5 minutes, it shall not show any appreciable shrinkage in area. In any case shrinkage shall not exceed 5 percent.

**(J) Chamois Leather :**

(i) *Moisture* : Same.
(ii) *Fat* : 5 to 10 parts per 100 parts of hide substance.
(iii) *Water soluble matter* : 4-6 parts per 100 parts of hide substance.
(iv) Non-Nitrogenous Organic matter shall lie within 9-11 parts per 100 parts of hide substance.
(v) Oil combined with protein shall lie between 5.2 percent—5.6 percent.
(vi) *Shrinkage temperature* :Range between 60°C—70°C.
(vii) *Water absorption* : The leather shall absorb water readily to a reasonable extent.
(viii) *Sinking test* : The leather shall not float but sink within a reasonable time when immersed in water.

**Quicker Method for Determination of EPSOM SALT in Leather :**

The ash from 5 to 10 gms. of leather is moistened and N/5 HCl added in presence of Thymol Blue until a pink colour is obtained. The liquid is boiled to remove carbon dioxide, cooled to room temperature and N/5 NaOH ($CO_2$ free) added slowly until it changes to greenish Blue colour. The whole is then rinsed into 25 or 50 ml. graduated flask, volume made up to mark and filtered. To an aliquot of about 10 cc., 5cc.—10cc. of N/5 NaOH ($CO_2$ free) is added from a pipette and well-shaken followed by 10-20 drops of Thymol Blue and twice or three times the total volume of acetone, then titrated with N/5 HCl until the blue colour changes to greenish yellow.

1 cc. N/5 NaOH = 0.0246 gm. $Mg.SO_4, 7H_2O$.

# 5 LAKH JOBS WILL BE CREATED WITH RS. 80,000 CRORES INVESTMENT AT ASIA'S LARGEST LEATHER HUB


West Bengal Chief Minister Ms Mamata Banerjee said, her government has taken a number of steps to protect the environment from the pollution at the leather hub and thus decided to set up eight effluent treatment plants. Chief Minister Mamata Banerjee on Thursday inaugurated several new initiatives at the Calcutta Leather Complex (CLC) at Bantala and said investments worth Rs. 80,000 crore will be poured into it to generate 5 lakh employment opportunities.

"This is not only the biggest leather hub in Asia, but in the world. Ninety eight percent of the world's leather gloves are made here. Once complete, this hub will generate 5 lakh jobs. I am naming this hub 'Karma Diganta'. At the Bengal Global Business Summit, we had said two lakh jobs will be created. In reality, 5 lakh jobs will be created with the investment of Rs. 80,000 crore," she said at the event.

Banerjee formally allotted 70 acres for 187 new tanneries from Kolkata, Kanpur and Chennai, taking the total number of tanneries at CLC to more than 790. Out of the 187 tannery companies being allotted plots, 28 belong to the big category, 97 are medium and 62 are small. Among these, 29 are from Kanpur, two from Chennai and 156 from Kolkata.

"At a time when employment opportunities are ebbing across India, we have been able to generate jobs. Since 2016-17, two crore jobs have been lost in the country. We have been able to reduce unemployment by 40 percent. After demonetization, the investors of Kanpur contacted us. We have given them land at a concessional rate. Besides, one lakh jobs will be created at Deocha Pachami," she said.

Banerjee said her government would also help tanners from the city willing to invest in the CLC to get lands.

"It's not my land. The land was given by the earlier government to someone else. We will provide special incentives to tanners to get land. There must not be any differences," she said.

Banerjee said her government has taken a number of steps to protect the environment from the possible pollution at the leather hub and thus decided to set up eight effluent treatment plants.

"We have taken some actions here. When the leather industry in Kanpur is shutting down (because of state PCB orders). We are building eight effluent treatment plants. And out of the eight, four are being constructed. Two will be completed by November and other two will be ready within a short time," she said.

The Chief Minister opined of shifting of the IT industries located at CLC to some other place.

"Slowly and slowly we will shift the IT industry from here to some other place. This place will open up a new horizon here in the world of leather industry. It'll be a unique hub," she said.

The CM also inaugurated Leather Goods Park and Tanning Training Services Centre. She also handed over six buses for transporting workers within CLC.

She also laid foundation stones of a footwear park, CFC for leather goods manufacturers, micro tanners' hub, eco-friendly CFC for leather scrap burners, seventh and eighth common effluent treatment plants, secured landfill sites for solid waste management, sewage treatment plant.

*(United News of India – 20/07/2019)*

## CREDIT LINKAGE TO SELF HELP GROUP IN BENGAL IS HIGHEST IN COUNTRY

**Status on Self Help Groups ... Credit**

| SL | State / Country | No. of SHGs (lakh) | Credit disbursed (Crores) | Credit / SHG (Rs.) |
|---|---|---|---|---|
| 1 | AP | 3.79 | 8171 | 215875 |
| 2 | TN | 1.80 | 1933 | 107443 |
| 3 | WB | 0.99 | 551 | 55481 |
| 4 | India | 11.48 | 16535 | 144046 |

The number of Self Help Groups (SHG) have doubled from 4.72 lakhs in 2010-11 in the last eight years.

West Bengal Chief minister Ms. Mamata Banerjee said that in the year 2018 - 19, the state's performance of credit linkage of Self Help Groups (SHG) in the Cooperative Sector is highest in the country. "I am very happy to share with all of you that during 2018-2019, West Bengal's performance of credit linkage of Self Help Groups in the Cooperative Sector is highest in the country.

"As per report of NABARD, West Bengal provided credit to 97, 535 Self Help Groups in the Cooperative Sector, leading to huge creation of employment and income generation, mostly among women," Miss Banerjee posted on her Facebook page.

In an attempt to empower and make women self reliant in both urban and rural areas, Miss Banerjee has recently announced an annual aid of Rs 5,000 for empowerment of the SHGs in the state. A total of Rs 500 crore would be spent for providing the benefit and SHGs registered for a period of one year or more will be able to avail it.

*(The Statesman – 10/07/2019)*

## GDP UPTO JUNE' 19, TO PRINT AT 5.7% ON DEMAND SLUMP, NBFC MESS : NOMURA


Despite the policymakers' efforts to revive the sagging growth momentum, the economy is set to print in a 5.7 percent uptick in the June quarter and is likely to bottom out from there, a brokerage has said. India presents a picture of "short-term despair and medium term hope", Japanese brokerage Nomura said in a note. The slowdown will be led by consumption and services, it said, attributing the same to the ongoing crisis among the shadow banks which have been funding the consumption drive before liquidity crisis hit them hard since last September, coupled with the weakening global growth and the resultant demand slump.

The brokerage, however, said the industry and investment indicators are relatively stable. "We believe GDP is yet to bottom, and expect it to further moderate to 5.7 percent in the June quarter, further down from 5.8 percent in March quarter," the note said.

Growth momentum is likely to pick up in the September quarter to 6.4 percent, which will go further to 6.7 percent in the three months after that, Nomura said, citing the data from its proprietary tools. "We will watch coming data prints to see whether they confirm or negate the sustainability of the turnaround in the growth cycle," it said.

It can be noted that the economy lost the verve and slipped to five-year low of 5.8 percent in the March quarter, thereby pulling down the overall GDP growth to a mutli-year low of 6.8 percent, even as policymakers have been setting ambitious targets like making the country a USD 5-trillion economy by 2025 which will entail an annual growth of 8 percent during these years.

Addressing the concerns on the growth front, the Reserve Bank has cut its key rates thrice by a cumulative 0.75 percent to a nine-year low of 5.75 percent between February and June and is set to slash again next week seizing on the opportunity provided by a cooling inflation. However, banks are yet to pass on the entire quantum of these cuts to their borrowers due to a time taken in transmission. SBI's move to cut deposit rates sharply announced Monday may fasten the transmission finally.

*(Financial Express – 29/07/2019)*

## CURRENT ACCOUNT DEFICIT (CAD) TO BE AT US$16-17bn in Q1 OF FY20: ICRA

ICRA expects the current account deficit (CAD) to remain largely steady at US$16-17bn or 2.3% of GDP in Q1 FY20, despite the recent contraction in merchandise exports and imports. It also forecasts India's CAD to widen to US$63-68bn in FY20, from US$57.2bn in FY19, while remaining would be steady at around 2.1% of GDP.

This de-growth is, however, likely to persist in the immediate term, given the year-on-year (yoy) decline in crude oil prices, and the impact of the recent customs duty hike on gold and precious metals. Such factors, in addition to the threat imposed by global trade wars, as well as sluggish domestic demand, are likely to restrict the overall growth of both merchandise exports and imports to low single digits in FY20.

ICRA forecasts India's CAD to widen to US$63-68 bn in FY20, from $57.2 bn in FY19, while remaining steady at around 2.1% of GDP. Aditi Nayar, Principal Economist, ICRA Ltd, said: "The widening in the merchandise trade deficit is likely to be absorbed by a mildly higher services trade surplus and remittance flows in Q1 FY2020. As a result, the CAD is expected to remain largely steady at US$16-17billion or 2.3% of GDP in the just-concluded quarter, relative to US$15.8 billion in Q1 FY2019."

Recently released data indicates that India's merchandise exports and imports contracted by 1.7% and 0.3%, respectively, in Q1 FY2020. "The prevailing YoY decline in crude oil prices and a temporary dip in gold imports following the tax changes introduced in the Union Budget, may well result in a contraction in aggregate merchandise imports as well as exports in July 2019. However, both these factors would contribute to a sizeable reduction in the size of the trade deficit in July 2019 to approximately US$16.0-16.5 billion from the US$18.6 billion recorded in July 2018, which was the highest monthly print for FY2019," Ms. Nayar added.

An anticipated decline in the average price of the Indian basket of crude oil to US$65/barrel in FY2020 from US$70/barrel in FY2019, the risk related to global trade wars, and signs of moderation in domestic consumption and industrial demand, would exert a drag on the headline pace of expansion of merchandise exports and imports in the ongoing year. Moreover, high gold prices may restrict growth in demand for imports of the precious metal. At present, ICRA anticipates that merchandise exports and imports would grow by a low 2-3% and 4-5%, respectively, in FY2020. Nevertheless, with the pace of growth of inbound shipments likely to exceed that of exports, ICRA expects the merchandise trade deficit to widen to ~US$193-198 billion in FY2020 from US$180 billion in FY2018.

A revival in gold imports, closer to the festive season, may push up the size of the CAD to US$28-30 billion in H2 FY2020, relative to the US$21.5 bn recorded in H2 FY2019. Overall, ICRA expects India's CAD to widen at an absolute level for the third year in a row, to US$63-68 billion in FY2020, from US$57.2 billion in FY2019, while remaining steady at around 2.1% of the GDP.

A sustained pick-up in the price of crude oil, which appears to be an unlikely scenario at present, remains a risk to the size of the CAD. According to ICRA, every US$1/barrel increase in the average price of crude oil in FY2020, is likely to expand the CAD by around US$1.6 billion.

*(Financial Express – 18/07/2019)*

-: JILTA :-

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