

# JILTA



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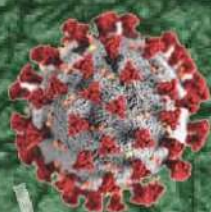
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# Our Activities

- An Association with over 600 members from India and abroad working since last 68 years for the growth and development of Leather and its allied industries.
- Organize seminars, symposiums, workshops in order to share information, knowledge & latest development and interactions for the benefit of all concerned.
- Organize Human Resource Development programmes on regular basis.
- Publish for over 60 years, a technical monthly journal namely "Journal of Indian Leather Technologists' Association" (JILTA), widely circulated through out the World.
- Publish books for the benefit of the students at various levels of study, for the Research Scholar and the Industry.
- Work as interface between Industry and the Government.
- Assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies for the growth of the Industry.
- Assist small and tiny leather goods manufacturers in marketing their products by organizing LEXPOs in Kolkata and different parts of India.

## Indian Leather Technologists' Association

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

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# JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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**Opinions expressed by the authors of contributions published in the Journal are not necessarily those of the Association**

# JOURNAL OF INDIAN LEATHER TECHNOLOGISTS' ASSOCIATION (JILTA)

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

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

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

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# Effects of Climate Change on Economy



Unpredictable weather events such as droughts, floods, heat waves, cold snaps, storms and wildfires are likely to become increasingly common over the next few years due to climate change, potentially causing significant human casualties and economic damage in the process.

Likely economic impacts of an increasingly volatile climate are discussed as below:

Extreme weather events can directly harm individuals, damage buildings and undermine infrastructure. The wreckage that such disasters leave behind requires significant repairing and rebuilding in order for communities and indeed economies to return to functioning level. In the Philippines for instance, the recent Typhoon Rai, which destroyed homes, ruined crops, inundated villages and uprooted power and communications infrastructure, was the latest in a series of typhoons which have cost the country USD 1.2 billion per year on average between 2000 and 2016, according to one estimate from the Asian Development Bank.

In wealthy countries, human casualties from natural disasters tend to be fewer than in developing countries, due to better early warning systems and a greater response capacity. However, even in these contexts, the cost of extreme weather can be stark in economic terms. The National Oceanic and Atmospheric Administration put the total cost of extreme weather events in 2021 in the U.S. at USD 145 billion, with notable events including Hurricane Ida, wildfires, and a deadly heat wave in the West. On a global scale, one study puts the cost of extreme weather events at USD 3.6 trillion over the last five decades. Three of the 10 costliest hurricanes in U.S. history occurred in 2017: hurricanes Harvey, Maria and Irma.

Secondly, a higher frequency of extreme weather events threatens increased negative shocks to productivity. To begin with, extreme heat and cold can make it impossible to work. Extreme weather can also hamper productivity by damaging

infrastructure and contributing to power shortages. Furthermore, extreme weather events may harm workers' health. Floods, for example, may increase an individual's risk of developing gastrointestinal illness, while drought may cause malnutrition and contribute to the spread of waterborne diseases as a result of more limited access to clean drinking water. Natural disasters also pose a risk to mental health, particularly if they result in a large disruption to an individual's regular living arrangements, bereavement or forced displacement. This could, in turn, result in reduced productivity. As an example.

Take Iraq: Last summer the country suffered significant economic disruption from power cuts amid soaring temperatures. As the country's summers have become longer and drier, electricity demand increases as air conditioners are switched on. Simultaneously, electricity supply is stymied as hot weather causes electricity generators to run less efficiently. A repeat of such electricity shortages poses a significant threat to Iraq's economic prospects ahead. The picture is similar in wealthier nations. In Europe, a recent study in the journal *Nature* put the economic burden of heat waves at 0.3–0.5% of GDP in the years that they occurred. In the case of the U.S., a report by the Atlantic Council estimated that by 2050, productivity-related losses due to extreme heat could amount to half a trillion dollars annually.

Extreme weather events also pose risks to price pressures. On the upside, events such as droughts or floods could lead to a reduction in food supply and damage infrastructure, hindering the transport of goods. In the Philippines for instance, Typhoon Rai threatens to cause inflation to spike early this year amid significant damage to agricultural land. Likewise, in Haiti, an earthquake and subsequent tropical storm Grace caused significant damage to agricultural land and critical infrastructure last year, contributing to the recent spiral in inflation—which hit 24.6% in November 2021. However, downside risks are also present. Natural disasters can dampen economic activity and consumer spending, for instance, leading firms to lower their

prices in response. Furthermore, rebuilding efforts in the aftermath of a natural disaster could boost supply and push down price pressures in the medium term. The overall impact of natural disasters on inflation is thus ambiguous, depending crucially on the type of disaster, its intensity and duration, and the country affected. In general, developed countries are less likely to see strong price swings than developing countries.

The fourth impact of higher-frequency extreme weather events is a potential increase in financial market risk. Although in the past the impact through this channel has been more muted compared to those aforementioned—with 2005's Hurricane Katrina causing the New York Stock Exchange to move less than one percentage point despite causing USD 150 billion in direct damages—as extreme weather events increase in severity and frequency, the financial market impact is likely to be exacerbated. For instance, financial institutions with assets in sectors likely to be especially hard hit by extreme weather events—such as agriculture or tourism—could see their balance sheets hit significantly.

Losses incurred by insurers are also likely to rise sharply, while potential large-scale conflict or mass migrations as a result of climate change could heavily affect firms' profitability and financial market activity more broadly. Plus, if natural disasters lead to a sudden shift in government policy—such as a snap decision to ban polluting activities—this would weigh heavily on asset prices in the fossil fuel sector. This could in turn cause problems for banks and other corporates with investments in the fossil fuel space, potentially leading to a wider market sell-off. In recent years, monetary authorities have begun to take more notice of the financial risks of climate change. Former Bank of England Governor Mark Carney highlighted these risks as early as 2015, while central banks such as the European Central Bank have begun to undertake climate change risk stress tests on financial market institutions.

Finally, increased extreme weather events threaten to widen between- and within-country inequality. In developing nations, large fractions of the population directly depend on sectors, such as agriculture, which are likely to be hardest hit by extreme weather events. In contrast, developed nations rely more on higher value-added services which are more immune to climate change. Developing nations also tend to be in parts of the world with more extreme climates, compared to the temperate conditions prevalent in much of the developed world. As such, the gap between rich and poor economies could widen in the absence of comprehensive climate change mitigation strategies. Meanwhile, within countries, lower-income households are likely to suffer especially significant economic losses from extreme weather events, as they are less likely to be able to afford insurance which protects against climate risks. Moreover, they more commonly work in agriculture and live in homes which are less fortified against the elements.

While extreme weather events are virtually certain to become more common over the next few decades due to climate change, whether the economic cost of these events rises in tandem depends crucially on the extent of adaptation and mitigation efforts. In order to be successful, these efforts would likely require substantial financial support from developed to developing nations in order to help the latter adapt to a changing climate, alongside a two-way flow of strategy and best-practice sharing to ensure disaster readiness for all. Of course, a far more optimal solution to minimize climate-related economic damage would be to rapidly accelerate the green energy transition—but this appears a fairly distant possibility at present momentum of thought and its implementation process.

*Goutam Mukherjee*  
**Dr. Goutam Mukherjee**  
Hony. Editor, JILTA

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*Read and Let Read :-*

JILTA



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

Stahl Campus®



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

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

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# WELCOME TO THE GREAT MATERIALS ‘SQUID GAME’

One of my favourite TV shows of 2021 was *Squid Game*. Set in South Korea, it involves a group of contestants taking part in complex challenges for the chance to win a life-changing cash prize. Those who fail don't just lose the game; they are put to death. Because they are in huge debt, the contestants have little choice but to take part – carrying on as normal is not an option.

As a specialist in renewable chemistry, this desperate situation reminds me of what's currently unfolding in materials science: everyone is looking for that one, perfect solution that will save the world (and capture the imagination of investors) –

whether that's based on low carbon, renewable feedstocks (like biomass, captured carbon or recycled content), or circular design processes that include sustainable end-of-life solutions.



It seems that for any single material to “win the game,” the other options on the table all need to be eliminated.

## Borrowing from another era

One thing everyone can agree on, however, is the need to move away from fossil-based raw materials. For more than 200 years, oil, gas, and coal have been the backbone of societal progress. After all, it's carbon-based fuels and materials that have helped to propel economic growth, enhance living standards, and enable the global population to expand more than eightfold since the start of the industrial revolution.

But this massive expansion powered by feedstocks we've “borrowed” from another epoch has come at a huge cost. It's only in recent decades we've realized the extent to which mankind has disrupted the natural carbon cycle by removing fossil-based resources from the ground, and adding them to the atmosphere.

The problem is, when your entire society runs on fossil-based materials, it's not so easy to wind back the clock.

## No magic bullets

How can we fill this giant, carbon-shaped void? And how can we engineer products to have a lower lifetime impact – from sourcing the raw materials they're made from to managing end-of-life processes? For some, the solution lies in biomass, a plentiful and fully renewable resource. Others see captured CO<sub>2</sub> as the answer, and a natural evolution from society's current carbon dependence. Look elsewhere, and you'll find researchers excitedly discussing how recycled materials offer solutions for all manner of products – and can solve society's waste problem in the process.

Rather than being used in combination, different materials and approaches are being pitted against one another in the race to find the single perfect material solution for our future society. The recycling industry, for instance, cites the amount of land and resources needed to produce biomass, while biomass specialists respond by listing the limitations of recycling, and pointing out how little of society's waste is currently being reused.



### Solving the materials challenge, one puzzle at a time

This kind of dog-eat-dog thinking, however, isn't helpful. We may be starting to transition out of the fossil-fuel era, but we're still very much in the trial-and-error stage. The suggestion that we're about to stumble across some magic, one-size-fits-all solution to all our problems is wildly optimistic.

For a more realistic approach, the materials transition needs to be less *Squid Game* and more like an "Escape Room", the live role-playing concept where teams work together in pursuit of a single, shared goal: getting out of the room. The only way to meet this overall challenge is to solve lots of smaller, individual puzzles with varying degrees of difficulty. Once all the puzzles are solved, the door to the room opens to reveal the prize. In this scenario, everybody wins, and nobody dies.

Puzzles in the Escape Room can't be skipped, but at the start of the game, no one knows which ones will lead to the end solution and which will turn out to be irrelevant. This is how we should approach the current materials challenge: we need to work as a team to solve all the different individual puzzles in our path. Nor can we speed up our path to the solution by skipping over potential solutions that don't look quite so promising – it's still too early to decide which ones will work and which won't.

Once we have identified all the workable solutions (and eliminated the unworkable ones)... that's when we can start creating combinations that will open the exit door to our current predicament.

### 50 shades of green

Another pop culture reference I find useful when describing the materials challenge is '50 shades of green.' Sustainability is often viewed in binary terms: a material is either "green" or it isn't. But, at this stage in the journey, we can't afford to ignore any potential solution, however raw or imperfect it might be.

Take recycled feedstocks. As it stands, only about 6% of all waste is reprocessed to make new materials, but to say recycling isn't a viable "green" option is misleading. It may be a very light green right now, but – with new technologies and increased government support – there's no reason why it can't turn a much deeper shade of green in the future.

This kind of thinking can be applied to any type of feedstock or material. To solve society's long-term sustainability challenges, we need all the solutions we can get our hands on – we shouldn't close the door on a possible option just because we haven't yet fully perfected the technology.

Of course, this trial-and-error approach isn't sexy. Making the best of the different materials we have available won't get investors excited – and they certainly won't make TV shows about it – but it's the most practical route we have to get out of our current carbon predicament.

At Stahl, we're proud to be part of this global hunt for the pieces of the sustainability puzzle. And we're looking forward to continuing internal and external collaborations to share our skills and knowledge. Whether it's through managing our products' lifecycles, using more recycled and bio-based feedstocks, or reducing waste and emissions across our entire value chain, every day we're getting one step closer to a future built on renewable chemistry.

Author: Frank Brouwer, Renewable Chemistry Specialist at Stahl

(Stahl News Room – 23/02/2022)





## *From the desk of* **General Secretary**

### **WEBINAR ON 4<sup>TH</sup> PROF. S. S. DUTTA MEMORIAL LECTURE**

The above was proposed to be organized by our association on 2<sup>nd</sup> February' 2022 like every year during IILF' 2022 at Chennai. As the IILF' 2022 has been rescheduled to May'2022, it has been decided that the proposed 4<sup>th</sup> Prof. S. S. Dutta Memorial Lecture would be organized at that time.

The Southern Regional Committee of ILTA would organize the same in assistance of the ILTA Central Committee like every year.

Details of the program will be intimated in due course.

### **WEBINAR ON 11<sup>TH</sup> PROF. MONI BANERJEE MEMORIAL LECTURE**

The above is proposed to be organized by our association on 15<sup>th</sup> March' 2022 like every year. This year also this would be organized on digital platform due to Covid 19 situation.

Details of the program will be intimated in due course.

### **MEMORIAL PROGRAM FOR LATE M. K. CHAKRABORTY & B. D. BHAIYA**

The above is proposed to be organized by our association in the month of April or May'2022.

In memory of both the personalities a one-day program with two sessions could be organized.

Details of the program would be announced in due course.

### **ELECTION FOR THE RECONSTITUTION OF THE EXECUTIVE COMMITTEE OF ILTA FOR THE TERM 2022 – 2024**

The Election procedure for reconstitution of the Executive Committee of ILTA for the term of 2021 – 2023 was about to start from the month of April – May of 2021. But due to Covid '19 situation the process was postponed till normalization the situation and the decision was ratified and passed unanimously in the 63<sup>rd</sup> Annual General Meeting of ILTA held on 30<sup>th</sup> September'2021.

In perspective of the present situation the Executive Committee now think that the Election procedure should be started from next April – May' 2022 onwards.

However, the final decision and the schedule of the Election will be intimated in due course.



**(Susanta Mallick)**  
General Secretary

## **YOUTUBE CHANNEL & FACEBOOK PAGE OF ILTA**

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

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

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

## **RECEIVING HARD COPY OF JILTA EVERY MONTH**

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

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

## **PUBLISH YOUR TECHNICAL ARTICLE**

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

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

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- b) Kindly mention your **Membership No.** (If any) against your each and every communication, so that we can locate you easily in our record.

---

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





ILTA  
Since 1950

### Solidaridad

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



switchasia  
GRANTS PROGRAMME



## EFFECTIVE WASTE MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN KOLKATA LEATHER CLUSTER(BANTALA) 2020 -2023

Circular Economy

Effective solid waste  
management

Capacity building  
programme



Trainings on Occupational  
Health and Safety

Robust public- private  
partnership

Efficient water  
consumption practices

EFFECTIVE WASTE MANAGEMENT  
AND SUSTAINABLE DEVELOPMENT  
**KOLKATA LEATHER CLUSTER**

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# *Accident prevention is the first priority!*

## *Capacity building on Occupational Health & Safety and Covid mitigation in Kanpur-Unnao Leather Cluster*

Occupational health and safety (OHS) is a multidisciplinary area concerned with the safety, health, and welfare of workers.

Globally, in every 15 seconds, there is a death related to workplace-related accidents or diseases and the toll goes up to more than 2.78 million people. In addition, there are 374 million non-fatal injuries at work each year worldwide. <sup>(a)</sup>

The Solidaridad Leather Project “*Pollution Prevention and Effective Use in the Kanpur Unnao Leather Cluster (Uttar Pradesh, India)*” developed and implemented an occupational health and safety programme to foster a safe and healthy work environment wherein workers feel protected. Poor occupational health and safety standards have indeed been linked to reduced productivity, poor job performance, and resource waste, which could have been prevented. The Kanpur project oriented 100 leather tanneries with the laudable intent of enhancing the condition and life of the workers, benefiting around 1,000 employees in 42 tanneries of Kanpur Unnao cluster through Occupational Health and Safety Programme.



### THE OBJECTIVES OF SOLIDARIDAD'S OHS PROGRAMME IN THE KANPUR-UNNAO LEATHER CLUSTER

- Bring about changes in workplace behavior to promote and sustain employees' physical, mental, and social well-being;

- Enhance the interior and outdoor environmental conditions in the workplace;
- Personnel protection against health risks;
- The creation and upkeep of a work environment that is tailored to each employee's physiological and psychological needs;
- To educate employees on the preventative elements of occupational health and safety.

OHS experts educate floor managers and workers on the nature of vulnerabilities in the tannery during capacity-building workshops. The training session incorporated:

- Identify potential risks and hazards
- Analyse risks;
- Find solutions to overcome the risks;
- Monitoring by setting up a committee with the tannery people;
- Control set up.

### NEED FOR OHS IN THE TANNERIES

Occupational health and safety in the workplace necessitate collaboration between employers and employees to create a healthy and safe working environment. To ensure this practice, the management was active in fostering the habit of safe working behaviors and passing these habits down to the tannery's workforce.

Health camps were set up by Solidaridad expert Dr. Ashish Mittal (*with experience of more than 25 years in OHS aspects related to MSMEs*). Training on Occupational safety is led by Mr. Rajshekaran (*with an experience of around 4 decades in OHS aspects related to MSMEs*). The training is organized with a key focus on following:

- Simple aerobic workouts for workers
- Use of Personal Protective Equipment (PPE) in (High-Risk) Jobs
- A mix of academic and practical education, as well as the identification of SPOCs (specific point of contact responsible for maintaining, repairing, and testing of safety tools
- Personal protective equipment methods to increase safety awareness in the workplace and prevent workplace accidents
- First Aid training in emergency situations



**OHS Workshop in a Tannery Shop Floor**

Through these workshops, Solidaridad approached 677 workers in 23 tanneries, focused on preventive aspects of industrial accidents, health care, safety, and personal hygiene.

## COVID-19 SAFETY AWARENESS

Businesses and production had been suspended due to the COVID-19 outbreak and lockdown.

The leather industry, which is part of the MSME sector, is generally unorganised, and many of its workers come from underprivileged populations. They were more vulnerable because of their lack of knowledge and experience with safety practices. It was a critical task for the Kanpur-Unnao Leather cluster to protect employees' lives during the Covid 19 outbreak. COVID-19 wreaked havoc in the leather cluster, causing significant damage.

Solidaridad in collaboration with Industry Associations (UP Leather Industries Association; Small Tanners Association) organized online sessions for tannery workers to educate them on critical aspects on Covid as per the Government's guidelines.



**Solidaridad Expert Training Tannery Workers**

In order to prevent further COVID-19 outbreaks, Solidaridad advocated establishing a mass vaccination programme for the Kanpur Leather Cluster employees in co-operation with the Chief Medical Officer and District's health administration. The district's health officials backed Solidaridad's idea and vowed their assistance for such a worthy cause. Leaders in the sector, including the President of the UP-Leather Industry Association, the President of the Small Tanners Association, and the Managing Director of Super Tannery, volunteered to visit the immunisation camp and backed the Solidaridad's team efforts.

These camps vaccinate around 300 employees in the Kanpur leather cluster.





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## Solidaridad Corner



### VACCINATION DRIVE FOR WORKERS IN KANPUR LEATHER CLUSTER

Solidaridad is working toward establishing a holistic approach to Occupational Health and Safety in regions where it has a presence, including Kolkata and the Tamil Nadu Leather Cluster. The program involves fundamental health and safety practices for industrial employees, as well as activities related to sustainable process development, all of which work together to create a sustainably developed environment.



**CVID 19 Vaccination Camp**



**Changing Behaviour to adopt COVID 19 Protocol**



**OHS Workshops in Kanpur Tannery**



**Solidaridad**

# PROCURING FUNGAL LIPASE FROM LEATHER WASTES : AN UNCONVENTIONAL APPROACH TO APPLY BIO-CATALYSIS IN LEATHER INDUSTRIES



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**Abstract :** Globally, present scenario demands a more reliable, sustainable, environment-safe and economically viable methods to deal with the escalating problems of ecological issues. Therefore, the focus of this work is to opt for such ideas and technologies involving cleaner, safer and greener procedures for reusing and valorizing wastes to obtain value added products. The leather goods spoiled by excessive fungal growth on them are otherwise thrown away as waste. In order to reuse waste to derive valuable products in form of enzymes is the aim of my work. The fungal colonies are isolated from leather goods and cultured in laboratory to ferment it and produce fungal enzymes (biocatalysts), then these fermented end-products can be employed in leather industries for carrying out various chemical reactions and other operations. This way, conventional use of chemicals and harsh reagents can hence be reduced or replaced to a great extent with fungal enzymes. Pretanning operations in the leather industries can be exploited for employing enzymes in these cases. So, in this work, we first targeted to isolate fungal colonies from waste leather items, cultured in laboratory and fermented them under various conditions to extract fungal enzyme i.e., lipase. Lipases are highly versatile and industrially vital enzymes. Deriving the lipases from waste areas is the chief lure of this work, manipulating valorizing of wastes.

**Keywords:** sustainable, ecological issues, fungal colonies, oil rich source, lipase, valorizing.

## 1. INTRODUCTION

Due to the escalating pollution rate of environment, there has been a global drive to encourage ideas supporting green technology. Major advancements have been made for encoding

protein structure and function for using it in biocatalysis. Scientific revolution in enzyme directed biocatalytic transformation has become an important tool for rational designing of sustainable ecofriendly industrial process development [1]. Manufacturing enzyme properties such as stability, activity, selectivity and substrate specificity modify the rate of biocatalytic process [2]. Fungal lipases are preferable over bacterial lipases because of their easier extraction and purification processes, reason being extracellular in nature of fungal enzymes. Lipolytic fungal species compete efficiently with other forms of life for survival by some important control mechanisms. Lipid sources seem to be generally vital for obtaining a high lipase producing fungi. Discarded leather products decayed by fungal growth are used as main source of fungal colonies. Lipases produced from microbial origin has huge industrial requirements [3]. The global market asks for industrial lipases application scope for development of new industrial process including leather industries. Lipases have many applications and benefits in the pre tanning operations of leather processing [4,5]. Lipases have the ability to bring about hydrolytic and synthetic reactions in both aqueous and non-aqueous media, hence have multifold applications in other post tanning operation in leather processing as well [6,7]. The most traditional application of lipases has been found in the degreasing operation [8] which might be extended to a variety of other operation such as fat liquoring. Conventional fat liquoring entails huge drawbacks. Uneven diffusion of fat molecules inside the hide and skin is responsible for uneven dyeing and finishing, waxy patches which demerits the product quality. Accordingly, one strategy to overcome this trouble is by utilizing fungal lipase for hydrolysis of fat liquor.

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## 2. OBJECTIVE

The objective of this study was to identify extracellular fungal lipase sources, which can be used as a basis for further basic and applied researches in leather processing. In addition, this work is aimed to examine enzyme production by lipase producer isolates on various environmental conditions. The goals included the isolation of lipase producer and characterization of lipase. For this purpose, the following specific objectives have been formulated :

- Isolation of fungal colonies from leather samples
- Screening of extracellular lipase producing fungi using tributyrin contained agar plates
- Investigation of lipase production of selected strains under various culture conditions

## 3. MATERIALS AND METHODS

Potato dextrose agar (PDA) medium PDA medium was used for storage of fungal cultures or fresh seeding for preparation of liquid cultures. Tributyrin Agar (TBA) medium was used for selective isolation of lipophilic fungi. Tributyrin was replaced by mustard oil in general composition of TBA medium. All other compositions were same. Other chemicals Lactophenol cotton blue was used for fungal staining. Tween 80,  $\text{CaCl}_2$ ,  $\text{KH}_2\text{PO}_4$ ,  $\text{K}_2\text{HPO}_4$ , HCl, NaOH, Ninhydrin, BSA were also required. For the present study samples were collected from soil and oil contaminated soil from Diamond Harbor, District-South 24 PGS, West Bengal, India.

One pure strain is obtained from discarded leather samples were used for the study i.e., *Aspergillus niger*.

### MEASUREMENT OF GROWTH CURVE

The growth pattern of the pure isolate was characterized in liquid media. 150  $\mu\text{L}$  of PDB and TBB were inoculated with 25  $\mu\text{L}$  PDB seed culture. The microorganisms were then placed in an incubated orbital shaker (MODEL ZHWY100B) at the speed of 120 rpm and temperature of 37°C. Growth of the cells was monitored by checking its optical density at 600 nm at an interval of every 10mins with UV-visible spectrophotometer (Model HOLMARC SPECTRA HO-SP1911). Each of them is analyzed in triplicate. The values recorded were then used to prepare growth curves for each of the microorganisms. Optimization of media parameters was carried out for profound enzyme activity. Fungal growth and lipase enzyme accumulation were studied in the

present investigation in flask batch cultures under different growth conditions [9,10,11]. These conditions include incubation time, incubation temperature, pH, different carbon and lipid sources, and surfactant. The aim of these experiments is the optimization of lipase enzyme production by the strain under investigation. Lipase production is influenced by these physiologically important growth parameters i.e., temperature, pH, lipid, carbon source, presence of surfactants and time [12]. Each experiment was repeated three times. 25  $\mu\text{L}$  of mother culture were added into the 200 ml tributyrin broth from 1 to 3 hours at 25 and 37°C. The lipase production was then evaluated over a wide range of pH 4, pH 7 and pH 10. Further the changes of lipase production in response to the following lipid source (1% w/v) were evaluated, mustard oil, castor oil and sunflower oil.

**Effect of temperature** : Temperature is one of the most significant parameters regulating the activity of microorganisms in natural environments. Generally, there is an optimal temperature for the enzymatic activity produced by different microorganisms which is responsible for the biosynthesis or degradation of compounds. This optimal temperature may be similar or different from the optimal temperature of the microbial growth and the growth curve was studied by varying the temperature at 20, 37 and 45°C to select the optimum temperature for maximum enzyme production by keeping the remaining parameters constant. To determine the effect of incubation temperature on mycelia growth which in turn influences enzyme production.

**Effect of substrate on biomass yield** : Substrate specificity affects the mycelial growth and enzyme production. To assess the effect of various substrates on lipase activity, 1% mustard oil, sunflower oil and castor oil was added to the culture media, separately. Remaining culture conditions were maintained constant

**Effect of pH** : By varying the pH to acidic, neutral and basic conditions and keeping other variables constant, the effect was studied to optimize the growth rate curve of the pure isolate and to inspect at what specific pH condition, maximum growth rate can be obtained.

## 4. RESULT AND DISCUSSION

The only organisms isolated were fungi as bacteria did not grow on the isolation medium. This may be due to differential growth conditions, especially composition. Due to the oil rich

environments of the substrates, special attention was given to screening of lipolytic enzymes [13]. The enzyme activity was associated with growth of the cell and favorable environmental conditions. The recorded optical density with an interval of 10 min is representative of increased cell biomass with different time interval. Graphs were plotted with time versus optical density. Growth and multiplication of microorganisms on any substrates is often considered as the first step toward its bioconversion. Activity of lipase is directed by the biomass yield. This biomass yield is controlled by a variety of factors such as type of substrate, pH, temperature. These include factors that alter the binding of the enzyme to the substrate, the molecular properties of the enzyme, and structure of the substrate [14]. Therefore, in the work reported here, it was vital to institute an experimental design to test the effects of all the factors on the growth pattern of sample could be distinguished based on OD changes. The first phase was lag phase where no change in OD was observed. Rapid increase in OD indicates log phase. The next phase was the stationary phase, where there were no changes in OD. Last phase was death phase where negative slopes of the growth curve were observed.

### Optimization of culture condition

Nutrient medium is a major factor that influences on fungal growth. All the media supported the growth of filamentous fungi to various degrees. An optimal nutrient medium should provide adequate growth and best possible growth, allowing molds to grow without restrictions. The growth of filamentous fungi is characterized by smoother curve and long transition periods although it is dependent of medium and species. The stages of fungal growth differ depending on the growth of microbes in the different media. Prolonged log phase is observed in case of colonies growing in TBB media as compared to PDB media. This could be due to the fact that the media nutrients are depleted more readily in PDB, so the isolates tend to enter in the death phase sooner. Tributyrin agar is a differential medium for lipophilic fungal growth.

### Optimization of culture condition for temperature

A detailed characterization of temperature-dependent growth of three isolates demonstrates variation in growth performance. It demonstrates that environmental conditions, specifically

temperature, exert a strong influence on growth performance of the fungal isolate. Maximum growth rate is observed at 25°C which might also be the optimum temperature for enzyme production in further work. pH is one of the most important factors affecting the fungal growth and development and their relationships have been investigated. At acidic pH, it showed maximum growth rate and beyond that level, the growth rate kept decreasing.

### Optimization of culture condition for inducer

The compound, the inducer (oil), is one of the major factors for biomass yields. It is able to “turn on” production in cells in such a way that the enzymes are produced only when needed. It has shown that presence of lipid (especially natural oils) stimulates lipase production.

## 5. CONCLUSION

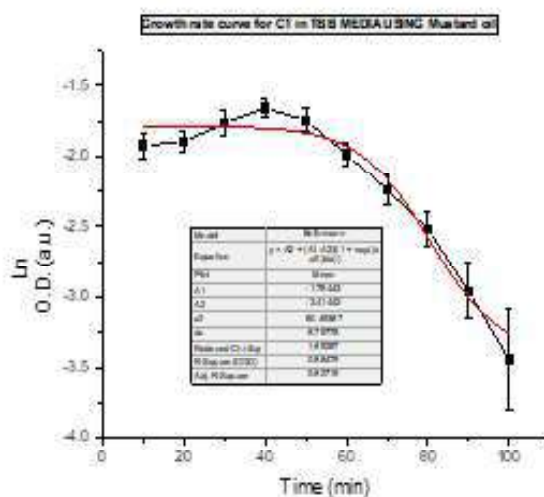
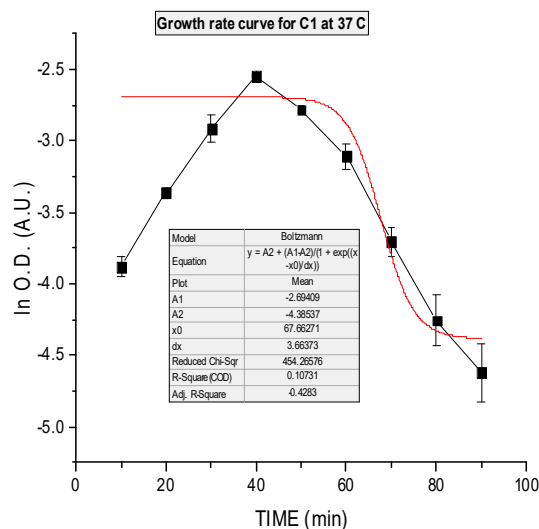
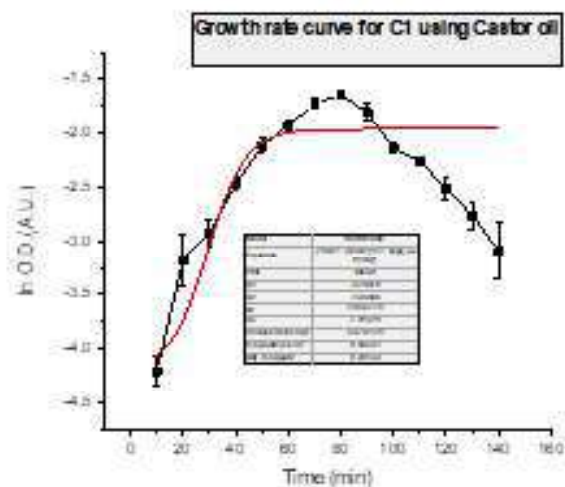
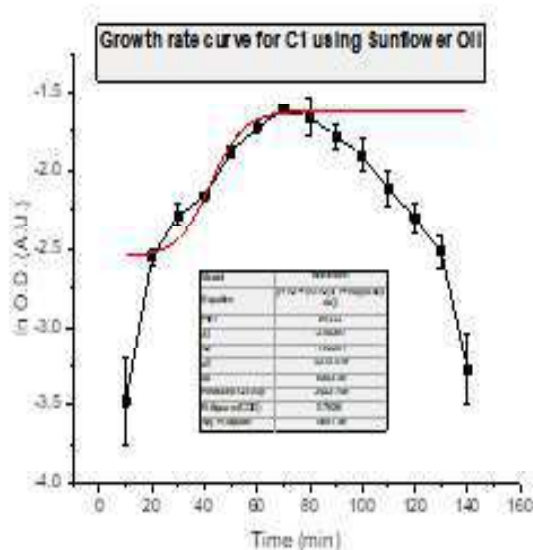
In present investigation, an effort has been made to study the lipase production by pure strain of fungi under various optimizing conditions. These observations provided interesting perspectives, demonstrating that fungi isolated from leather wastes represent a source of several enzymes potentially exploitable for biotechnological purposes. The use of fungal lipases for catalyzing esterification reaction became considerable interest because lipase mediated hydrolysis is an energy saving process. The great advantages of fungal lipases are that they are easily amenable to extraction due to their extracellular nature, which will significantly reduce the cost. Microbial lipases have gained special industrial attention due to their ability to remain active under extremes of temperature, pH and organic solvents, and chemo-, region and enantioselectivity. Lipase is frequently used to catalyze the hydrolysis of wide non-natural substrates in order to obtain enantio- and region selective substrates. Among those enzymes, lipase is predominantly used in several applications. These fat splitting enzymes are attractive because of their wide industrial applications. The reasons for the enormous biotechnological potential of microbial lipases are: their stability in organic solvents, they do not require cofactors, possess broad substrate specificity and exhibit a high enantioselectivity. The use of fungal lipase in leather industry is becoming increasingly important. Lipases have found application in the soaking,



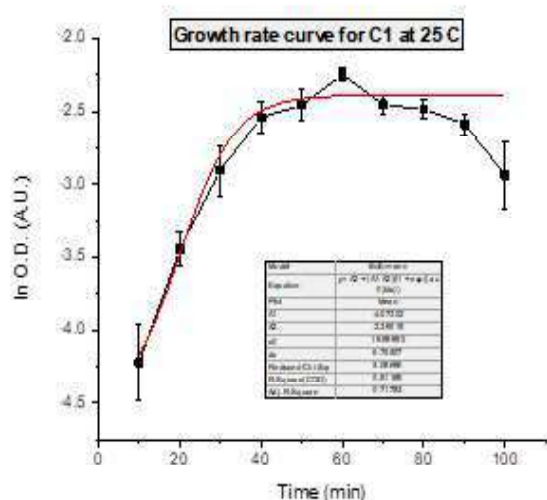
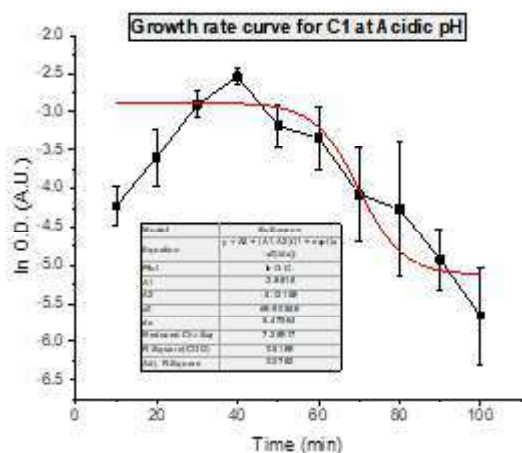
dehairing, bating, and degreasing operation in leather making. The great advantage of fungal lipases is that they are easily amenable to extraction due to their extracellular nature, which will significantly reduce the cost and makes these lipases more attractive than those bacteria. In nature, microorganisms can adapt to a changing ecological situation within a certain limit. Experimental results suggest that various media compositions influenced fungal growth. Optimization of growth parameters viz. temperature, pH, carbon source, had significant effects on the growth rate. After optimization under various parameters, maximum growth rate was observed. Further work has to be done by varying other physiological and chemical conditions to obtain the most favorable conditions under which lipase can be produced and hence can be applied on leather and other industries to carry out different operations and processes. This will ultimately lead to a shift from the dependency on harsh chemicals to safer, greener and more economic option of using enzymes or biocatalyst and will also have a huge effect on reducing the environmental pollution rate in the long run.

## Figures

The following graphs show the growth rate curve for the pure strain of fungal isolate (*Aspergillus niger*) under varying pH, Temperature and lipid source. The specific growth rate is denoted by  $\mu$  in each case. greater the value of  $\mu$ , better is the growth rate under that specific condition.







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It is with great pleasure, that we invite you to participate in the 12th Asia International Conference of Leather Science and Technology (AICLST), hosted and organised by the New Zealand Leather & Shoe Research Association in the beautiful and picturesque city of Queenstown in New Zealand's South Island on 18-20 Oct. 2022.

Queenstown sits on the shores of the South Island's Lake Wakatipu, set against the dramatic Southern Alps. Renowned for adventure sports, it's also a base for exploring the region's vineyards and historic mining towns. There's bungee jumping off Kawarau Gorge Suspension Bridge and jet-boating on the Shotover and Dart rivers. There is also the possibility of skiing on the slopes of The Remarkables and Coronet Peak.

The three-day programme promises excellence in science, along with practical examples of science impact and the drive to sustainable leather production. We seek to foster strong and lasting bonds between leather scientists across the international community with companies engaged in leather production and chemical companies who deliver the products used to manufacture leather.

## Main Topic Areas:

- ❖ Advances in Basic Science of leather
- ❖ Benign chemical developments
- ❖ Cleaner leather production and closed-loop processing
- ❖ High value uses for leather manufacturing by-products and wastes
- ❖ Technologies to advance protection of the environment in the leather industry
- ❖ Advances in detection technologies applied to leather manufacture and quantification
- ❖ Intelligent leather technologies – Industry 4.0
- ❖ Design innovation for fashion leathers



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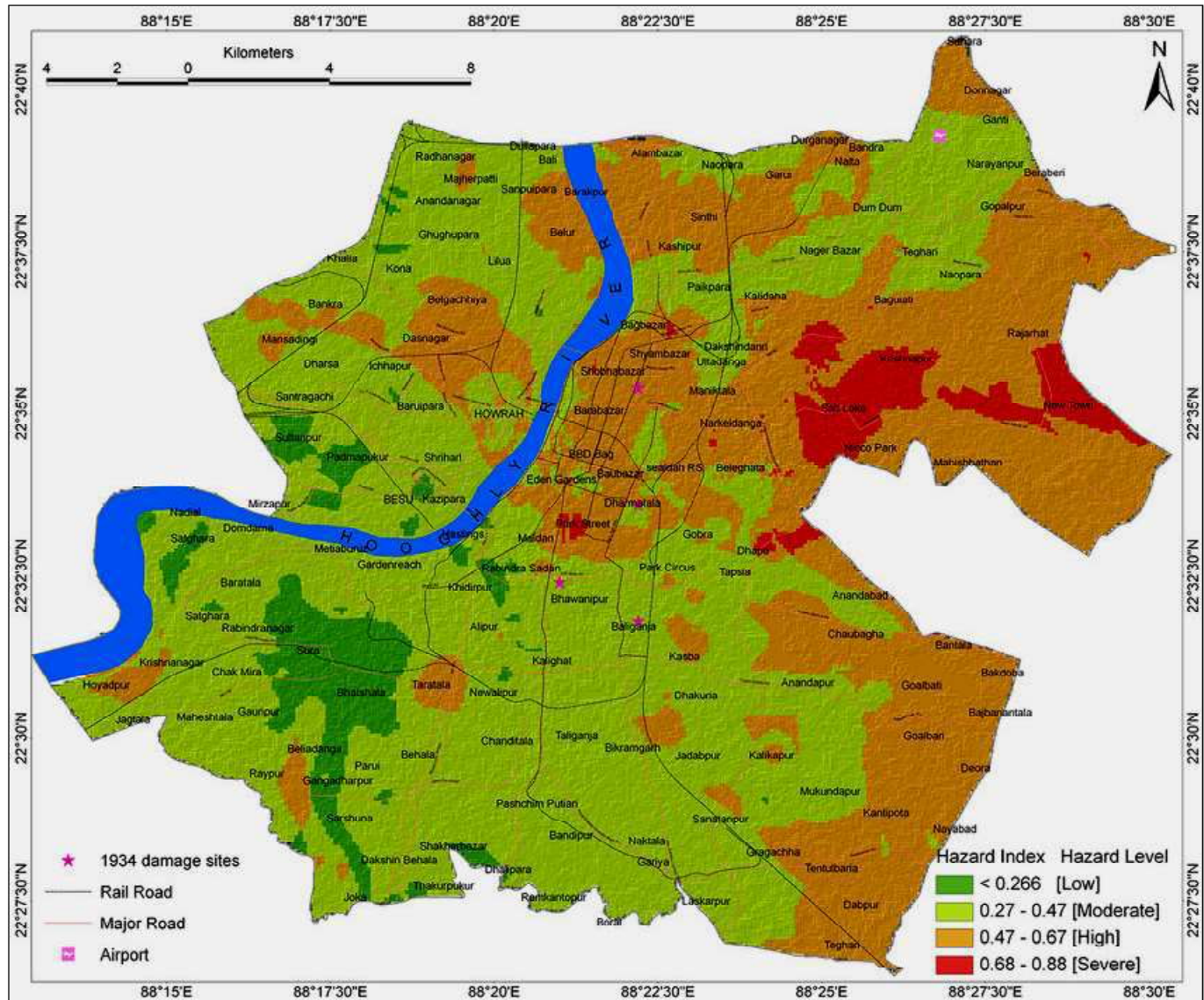
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# Liquefaction of Soil and the Risk Assessment

**Dr. Buddhadeb Chattopadhyay**

Former Principal, Government College of Engineering and Leather Technology, Kolkata.  
and MCKV Institute of Engineering, Howrah.



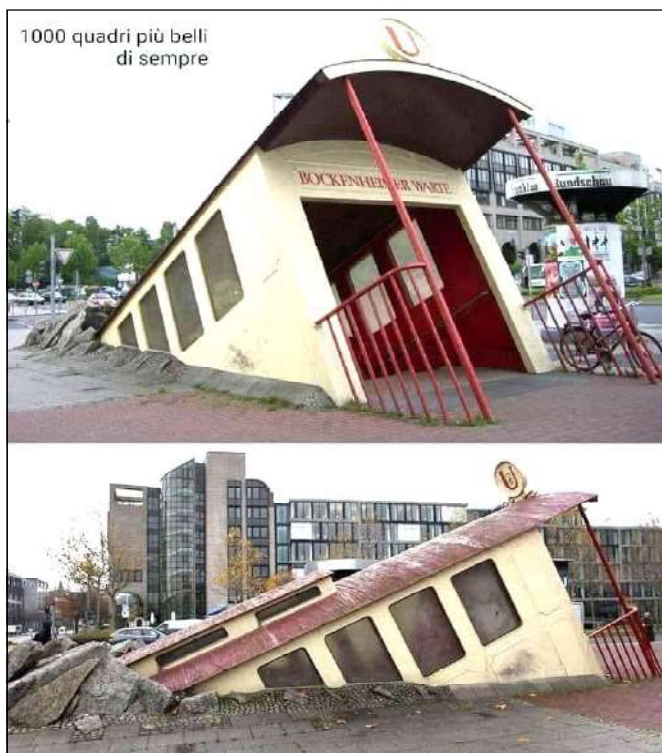
Due to land filling with sediments and the Municipal solid wastes at least 25 ft under the surface of soil is decomposed organic substances with very low compactness and impact resistance and therefore Kolkata is in the Zone III and IV of the Seismic scale. May God forbid if there is an earthquake in the range of 5.0-5.5 Richter with an intermediate duration there can be a

very high disaster because most of the buildings and high-rises of the city has not been built as per the guidelines of anti-seismic construction. Salt Lake, New Town, Rajarhat, East Calcutta entirely are in zone IV with very high severity (Red coloured areas in the map).



While constructing our Library Building of the Government College of Engineering and Leather Technology and also at the Kolkata Leather Complex, we noticed the soil test report and we had to dig a great many piles of a greater depth to encounter the anticipated liquefaction.

A heavy object like building etc can sink into the ground during an earthquake if the sinking causes the ground to undergo “liquefaction”, in which the soil grain experience little friction as they slide over one another. Like a liquid the soil grains will have a short-range order, means a larger portion of void space to accommodate the heavy mass to sink, in the same way as it happens to be in water. The ground then may be effectively called as “quicksand”.



Bockenheimer Warte is a Subway station in Frankfurt, Germany

The possibility of the liquefaction in sandy ground can be predicted in terms of the “void ratio (e)” for a sample of the soil. Where  $e = V_{\text{voids}} / V_{\text{grains}}$ . Here,  $V_{\text{grains}}$  is the total volume of the sand grain in the sample and  $V_{\text{voids}}$  is the total volume between the grains (in the voids), If, e exceeds a critical value of 0.80, liquefaction can occur during an earthquake.

In such a hypothetical case what would be the critical sand density  $d_{\text{sand}}$ ? Solid Silicon dioxide is the primary component of the sand and it has a density  $d_{\text{SiO}_2} = 2.600 \times 10^3 \text{ kg/m}^3$ . The density of the  $d_{\text{sand}}$  of the sample can be said as  $d_{\text{sand}} = m_{\text{sand}} / V_{\text{total}}$ .

$$\text{Total volume } V_{\text{total}} = V_{\text{grains}} + V_{\text{voids}}$$

Dividing both sides by  $V_{\text{grains}}$ , we get :-

$$\begin{aligned} V_{\text{total}} / V_{\text{Grains}} &= V_{\text{grains}} / V_{\text{grains}} + V_{\text{voids}} / V_{\text{grains}} \\ \text{Or, } V_{\text{total}} / V_{\text{grains}} &= 1 + e \quad [\text{since } e = V_{\text{voids}} / V_{\text{grains}}] \\ \text{Or, } V_{\text{grains}} &= V_{\text{total}} / (1 + e). \end{aligned}$$

$$\begin{aligned} \text{Similarly, we can say also } m_{\text{sand}} &= d_{\text{SiO}_2} V_{\text{grain}} \\ \text{Or, } d_{\text{sand}} &= [d_{\text{SiO}_2} / V_{\text{total}}] \cdot [V_{\text{total}} / (1 + e)] \\ \text{Or, } d_{\text{sand}} &= d_{\text{SiO}_2} / (1 + e) \\ \text{Or, } d_{\text{sand}} &= 2.600 \times 10^3 \text{ kg/m}^3 / 1.80 = 1.4 \times 10^3 \text{ kg/m}^3 \end{aligned}$$

A building can sink underground several meters under such circumstances. The taller the building is, heavier is the mass and this means the sinking of entire one or two floors underground cannot be ruled out, if it submerge vertically. If, inclined there may be several cracks due to stress and that can cause a collapse of the whole building.

This exercise is not to create panic, but the home work of a lazy mind.

*Read and Let Read :-*

JILTA

### COUNCIL FOR LEATHER EXPORTS CONFIDENT UNION BUDGET WILL AID INDUSTRY



The Council for Leather Exports has expressed its confidence that the new Union Budget's measures for the leather industry will boost exports and help support micro, small, and medium enterprises.

"The budget has announced major support measures, which will provide a fillip to the growth of exports from the leather and footwear industry," said CLE chairman Sanjay Leekha after the new budget was announced, the Press Trust of India reported.

The exemption of products including embellishments and wet blue chrome tanned leather from import duty in the budget will help to increase outbound shipments of leather goods, the CLE said on February 2. By reducing the price of importing essential components for manufacturing leather goods, which are requested by overseas buyers, the government is helping to promote the export of value-added products which will boost the sector as a whole, according to the CLE.

The budget also includes an extension of the commencement date for manufacturing operations for newly incorporated domestic manufacturing companies. The date has been postponed from March 31, 2023 to March 31, 2024 for businesses wishing to avail the 15% concessional corporate tax which is designed to promote investments.

"Extension of Emergency Credit Line Guarantee Scheme will enable MSMEs to get additional credit at concessional interest rates," said Leekha.

India's leather and footwear industry has the target of reaching an export total of \$10 billion by the 2026 financial year and a domestic total of \$20 billion in the same time period.

"The announcements made in the Union Budget 2022- 23 will immensely help in achieving these targets," said Leekha.

(Source : The Fashion Network – 03/02/2022)

### NEW SEZ ACT WILL BE WTO-COMPLIANT, WILL HAVE HIGH-CLASS INFRA: COMM SECRETARY



The new law for special economic zones (SEZs) will comply with the global trade rules of the WTO and it will have a single-window clearance system besides world-class infrastructure and easy customs procedures, Commerce Secretary B V R Subrahmanyam said on Wednesday.

The government on Tuesday proposed to replace the existing law governing SEZs with a new legislation to enable states to become partners in the 'Development of Enterprise and Service Hubs' (DESH).

The existing SEZ Act was enacted in 2006 with an aim to create export hubs and boost manufacturing in the country. However, these zones started losing their sheen after the imposition of a minimum alternate tax and the introduction of a sunset clause for the removal of tax incentives.

Explaining the rationale behind the new law, the secretary said India needs large industrial manufacturing zones, which have world-class infrastructure so that those places become manufacturing hubs of the future.

"We are in the process of drafting a SEZ 2.0... We will recast the SEZ Act in the next couple of months.

"This new Act will lead to the revival of activities in SEZ areas. They will be manufacturing for both international and domestic markets," he told reporters, adding that in the next few months, contours of the new law will be ready.

"The new SEZ Act will be WTO-compliant and will have a single window (clearance system). High-class infrastructure will be there and more benefits will be there," he said.

A dispute settlement panel of the Geneva-based World Trade Organization (WTO) in its report on October 31, 2019, has ruled that India's export-related schemes (including SEZ scheme) are in the nature of prohibited subsidies under the Agreement on Subsidies and Countervailing Measures and are inconsistent with WTO norms. India has appealed at the WTO's appellate body against this ruling.

Currently, SEZs account for about 20 per cent of India's total merchandise exports. Originally, SEZs came up to take advantage of tax benefits but after the imposition of the sunset clause, those incentives are no longer there for the past two years to any new units.

"So, there is a need to move beyond SEZ Act," Subrahmanyam said, adding that the Centre will partner with states so that they become part of DESH.

Giving hint about provisions that could become part of the new law, he said there can be a single-window clearance system for both central- and state-level clearances and for that, "we may even think of putting states on the approval bodies either at state or regional level". He also informed that today, about 20,000 hectares of SEZ land and about 10 crore sq feet of built-up area is vacant in SEZs.

Some other issues raised by the industry about SEZs include the matter of payments. Payments for goods sold from SEZ to the domestic market are made in the rupee but for services, it is in dollars. Products sold from SEZ in the domestic market attract customs duties.

Talking about the Budget, the secretary said several measures are announced for the export sector.

About the gems and jewellery sector, he said import duty on cut and polished diamonds and gemstones to five per cent and zero on sawn (or raw) diamond will help make India jewellery hub of the world.

Due to the COVID-19 pandemic, a lot of small-value jewellery is traded on e-commerce, a lot of these orders are happening online. Finance Minister Nirmala Sitharaman has made it clear that in the next couple of months, by June, the government will come out with easy e-commerce rules for gems and jewellery business, he said.

He also said that exemptions are being provided on items such as embellishment, trimming, fasteners, buttons, zipper, lining material, specified leather, furniture fittings and packaging boxes that may be needed by bonafide exporters of handicrafts, textiles and leather garments, leather footwear and other goods.

Explaining it, he said some big companies in the US or Europe specify about the kind of buttons or threads they want in their clothes and for that, Indian exporters have to import these goods, which were earlier subjected to duty and now these items have been exempted.

A lot of customs duties on chemicals have been reduced and that will enable exports, he said adding customs duties has also been rationalised for the electronics sector and this move would boost domestic manufacturing.

"I think there is a fair amount of understanding between commerce and finance (ministries) that actually reducing tariffs on inputs helps exports a lot. So, having a very high tariff regime does not help and I think that message is coming through very clearly in the Budget," the secretary said.

*(Source : Economic Times – 02/02/2022)*

### **LEATHER, FOOTWEAR EXPORTS TO REACH \$6 BILLION IN 2022-23: COUNCIL FOR LEATHER EXPORTS**

The country's leather and footwear exports are expected cross \$6 billion (about Rs 44,800 crore) in 2022-23 on account of increasing demand in the US and new markets such as Middle East, Africa and Latin America, CLE Chairman Sanjay Leekha said. The exports stood at \$3.3 billion in 2020-21 and \$4.7 billion in 2019-20.



Chairman of the Council for Leather Exports (CLE) said implementation of recently signed free trade agreement between India and the UAE would also help in pushing the exports further besides creating employment in the sector.

During April-January this fiscal, leather and leather products exports rose by 33 per cent to \$3.6 billion. The exports stood at \$3.3 billion in 2020-21 and \$4.7 billion in 2019-20.

“We are getting good response from the US and that too from big brands. We are also looking to record healthy growth in Latin America, the Middle east, and Europe. In this backdrop, we are confident that we would cross \$6 billion in 2022-23,” Leekha said.

He added that the order books are healthy and the industry is upbeat about recovery from the impact of the COVID-19 pandemic. He also added that the industry is labour-intensive, providing employment to 45 lakh people.

“The sector has the potential to reach a total turnover of \$30 billion in next five years, which includes the domestic turnover of \$20 billion and export turnover of \$10 billion and generate additional employment for 15 lakh more people,” he added.

The industry is also urging the government to extend the Production Linked Incentive (PLI) Scheme to the sector. The government recently approved the Indian Footwear and Leather Development Programme (IFLDP) for continuation from 2021-22 with an approved financial outlay of Rs 1,700 crore.

*(Source : Business Today.in – 20/02/2022)*

### INDIA-UAE TRADE PACT TO BOOST APPAREL EXPORTS, EMPLOYMENT, SAY EXPORTERS



Implementation of the comprehensive free trade agreement between India and the UAE would help boost the country's exports and creation of lakhs of jobs, according to exporters. Welcoming the signing of the Comprehensive Economic Partnership Agreement (CEPA) between India and the United Arab Emirates (UAE) on Friday, Apparel Export Promotion Council (AEPCC) Chairman Narendra Goenka said that it will further strengthen India's dominant position in the UAE.

“With India supplying USD 1,515 million of apparel to the UAE as against its total imports of USD 3,517 million, Indian apparel exports contribute a decent share of 43 per cent. The trade pact would result in a drop of 5 per cent import duty for Indian readymade garments. This will further strengthen the dominant position of Indian apparels in the UAE,” Goenka said.

He added that Indian apparel exports to the UAE also cater to the needs of Saudi Arabia, Kuwait, Bahrain, Oman and the UK . Federation of Indian Export Organisations (FIEO) President A Sakthivel said that the pact will be beneficial to Indian exports particularly for the labour-intensive sectors like agriculture and processed food including meat and marine products, gems and jewellery, apparel and textiles, leather and footwears.

“Having a large Indian diaspora, the UAE consumes a large quantity of Indian cereals, fruits and vegetables, tea, spices, sugar, etc. Indian companies will gain in services like travel & tourism, transportation, IT and ITES and construction services,” he said.

Sharing similar views, Vikramjit Sahney, Chair of India-Arab Council, said that the pact is set to reduce tariffs for 80 per cent



of goods and gives zero duty access to 90 per cent of India's exports to UAE.

"Annual bilateral trade should increase from the current level of USD 60 billion to USD 100 billion and would augment Indian exports of gems and jewellery, textiles, leather, pharmaceuticals and engineering goods," Sahney said.

"India giving tariff concessions to UAE on gold and UAE eliminating tariffs on Indian jewellery will augment exports. The UAE investment in India will increase manifold especially in health, infrastructure and renewable energy," he added.

Council for Leather Exports Chairman Sanjay Leekha said that the UAE is one of the key markets for the sector and it would also give access to certain EU countries and Africa. "The pact would help in boosting exports and creating jobs," Leekha said.

Plastics Export Promotion Council of India (PLEXCONCIL) chairman Arvind Goenka said that currently India's annual imports of plastic raw materials are USD 14 billion and imports from the UAE are USD 800 million, so trade for plastics between India and the UAE is poised for a multi-fold growth due to this pact besides creation of about 2 lakh jobs in the sector.

"India's MSME industry will be the main beneficiary. Availability of cheaper raw materials as preferential import duty being offered by India will empower them to compete against cheap imports of finished plastic goods. Preferential access to the UAE market, as lower import duty is being offered for value added plastics and further access to WANA and CIS countries, will increase plastics exports by at least 300 per cent by 2023-24," Goenka said.

Founder chairman of Technocraft Industries India Sharad Kumar Saraf said the agreement has the potential of adding at least USD 2 billion in India's exports.

"It will also strengthen our ties with the UAE. Indian diaspora in the UAE will play a vital role in Indo UAE trade," he added. FIEO Vice President Khalid Khan too said that the pact will help boost bilateral trade between both the countries.

"It will benefit both goods and services. 90 per cent goods exports will have duty-free access to the UAE which is the biggest trading partner after the US and China and gateway to the Middle East and African countries," Khan said.

Kolkata-based marine exporter Yogesh Gupta said that this is a historic event paving the way for larger economic ties and the trust between India and the UAE. "It will have a long term effect on diplomatic relations as well. A move in the right direction," he said.

India and the UAE on Friday signed the trade pact after concluding negotiations in a short time of 88 days. The pact aims to take the two-way commerce to the USD 100 billion mark in over five years and create about 10 lakh jobs in sectors such as apparel, plastic, leather and pharma.

*(Source : The Economic Times – 19/02/2022)*

### LEATHER NATURALLY AND LWG TO WORK TOGETHER



Leather industry not-for-profit organisations Leather Naturally and Leather Working Group have announced an agreement to closer working practices through reciprocal membership.

In a statement, the organisations said that the agreement should lead to both industry non-profits working more collaboratively in the future.

Egbert Dikkers, Chair of the Leather Naturally Management Board, said: "We look forward to collaborating in educating about leather and communicating the role leather plays in a circular society where nothing is wasted, and everything can be re-used."

Meanwhile, Christina Trautmann, Head of Leather Working Group, added: "This reciprocal membership agreement signifies



the solidification of our collaboration with Leather Naturally. Our aligned focus is to provide consumers with the facts about sustainable leather and to better support brands with their communications about leather sourced from LWG supply chains.”

Debbie Burton, Leather Naturally board member, will lead a presentation at the upcoming ‘Future trends in a post-Covid leather industry’ hybrid conference ahead of APLF Dubai to delve into the organisation’s recent consumer research report, published alongside Leather UK and the University of Northampton.

*(Source : ILM – 18/02/2022)*

### LEATHER NATURALLY PUBLISHES GUIDE TO MODERN LEATHER MAKING



Leather Naturally has announced the publication of the Modern Leather Making Guide (MLMG), a comprehensive tool that anyone can consult to learn how modern leather is produced.

The guide has been created for a wide range of audiences, from designers and developers to students from the sectors of fashion, interiors, automotive and retail, to help them understand how leather is made.

According to Leather Naturally, the MLMG features in-depth and informative content on hide properties, modern leather processing, chemical management, test methods and leather types, together with a visualisation of a modern tannery.

The document is divided into chapters covering the whole leather making process, from hide to finished product, as well as sustainability, biodegradability and water treatment. It was edited by Dr Luis Zugno – Global Innovation at Buckman, IULTCS Secretary and Management Board Member of Leather Naturally, with the contribution and expertise of a global team of chemists, industry professionals and companies.

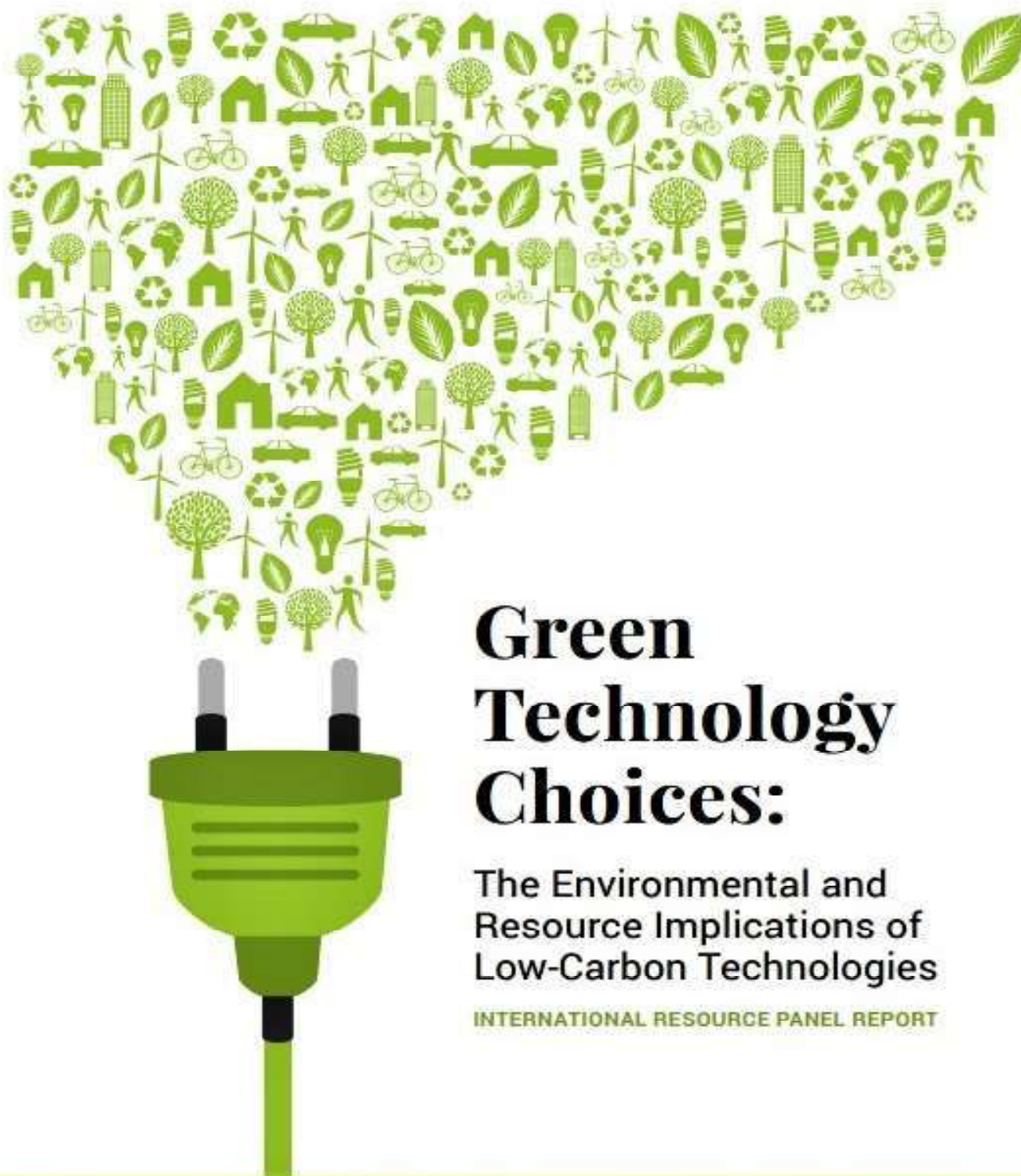
Dr Zugno said: “This comprehensive guide is the work of the largest global collaboration project in the leather industry to produce the finest technical, visual and inspiring presentation that elegantly communicates how modern cow leather is made. This is not my guide; it is ‘our’ team guide.”

To get your copy of the Modern Leather Making Guide, head to the Leather Naturally website.

*(Source : ILM – 18/02/2022)*

*Read and Let Read :-*

JILTA



# Green Technology Choices:

The Environmental and  
Resource Implications of  
Low-Carbon Technologies

INTERNATIONAL RESOURCE PANEL REPORT



*This article was originally published in Vol.- 19 No.- 11 November 1971 issue of JILTA.*

## EFFECT OF POLYMER MASTICATION ON THE PROPERTIES OF THE FINISHED BAYPREN ADHESIVES.\*

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Natural rubber adhesives or cements are being used in the footwear industry for a long time. With cotton as the fabric material and the function of the adhesive being just to hold together the unvulcanized shoe components till vulcanized, the natural rubber adhesive was and is still serving its useful role in the industry. However, when other upper materials like leather are used or when the shoe components are used in prevulcanized form, natural rubber adhesives are found to be inadequate for the purpose. Addition of the isocyanate like Desmodur R overcomes some of the disadvantages of natural rubber adhesive, but not all.

One disadvantage is that immediately after closing, the bondstrength is not of high order. The assembly, therefore, has to be carried out without any internal stresses in the material and any further handling of the assembly has also to be carefully done to avoid the separation of the components.

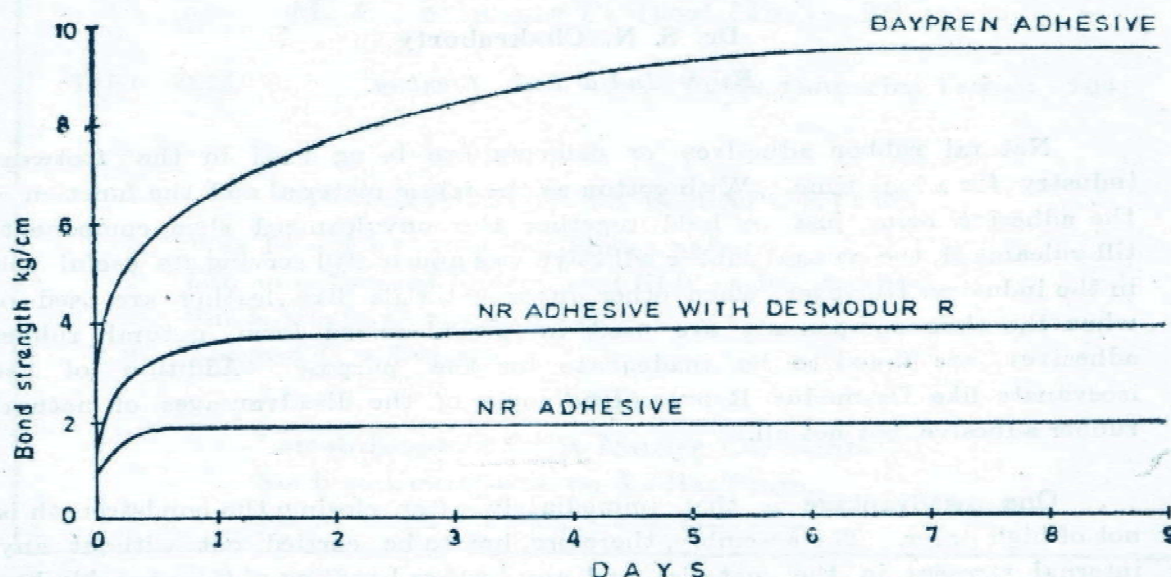
Second disadvantage is that the full bondstrength is not developed till the adhesive is vulcanized. When the shoe is made from prevulcanized components and further revulcanization cannot be carried out, a room temperature curing crosslinking agent like Desmodur R has to be used. Even in this case, though the ultimate bondstrength may be adequate enough for certain uses, about 12.24 hours must be allowed for the development of the adequate bond strength.

Cementing or 'stuck on' process is now becoming more popular for building up leather shoes with rubber soles. 'Stuck on' process gives shoes with better wear-life and water impervious nature than the 'stitched on' process. Chappals with leather uppers and microcellular rubber soles are becoming popular in our country. To avoid the deshaping of the chappal with the microcellular sole due to shrinkage of the sole, it is a common practice now-a-days to apply the microcellular sole to the leather upper on the retail shop floor at the time of delivery of the chappal to the customer. Within a short time after the application of the sole, the customer may start wearing the chappal. For such applications natural rubber adhesives even after addition of Desmodur R are found

Paper presented at the ILTA Technical Seminar on Projection on development of adhesives in India for leather industry with special reference to footwear held at Batanagar on November 11, 1971.



to be inadequate for the service. Polychloroprene based adhesives are therefore coming to be used more widely.



NR adhesive 100 NR 35 HAF 5 Zinkoxyd aktiv 580 SBP 55/115

NR adhesive with Desmodur R 100 NR adhesive + 8 Desmodur R

Baypren Adhesive 100 Baypren 320 30 PF resin 5 Mgo 1 Zinkoxyd aktiv

180 Toluene 180 Ethyl acetate 180 SBP 55/115

Fig 1 Fabric fabric. Peel adhesion with different adhesives

Figure No. 1 shows the bond strengths achieved with a natural rubber adhesive with and without Desmodur R and that achieved with Baypren 320 (a fast crystallizing polychloroprene) adhesive. Natural rubber adhesive with or without Desmodur R gives an immediate canvas—canvas peel strength of only 1 kg/cm without Desmodur R the maximum bond strength (peel strength) achieved is only 2 kg/cm and with Desmodur R the maximum bond strength achieved is of the order of 3.8 kg/cm. With Baypren adhesive the immediate bond strength achieved is of the order of 3 kg/cm. Within a day it increases to about 6 kg/cm and the final bond strength developed is of the order of 9.5 kg/cm.

A typical formulation of an adhesive used in shoe industry is given below (Table 1):



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TABLE I

	<i>Parts by weight</i>
Fast crystallizing polychloroprene e.g.	
Baypren 320, 321, 330 or 331	100
Heat reactive tert-butyl phenol formaldehyde resin	30
Extralight magnesium oxide	5
Zinkoxyd aktiv	1
Toluene	120
Ethylacetate	120
Petroleum solvent like SBP 55/115	120
Water	0.5

The fast crystallizing Bayprens give good tack, good bond strength immediately after closing and then develop a high bond strength as the polymer crystallizes.

The function of the resin is to increase the tack, the open tack time and the bond strength. However, the resins decrease the flexibility of the bond and hence 20-30 phr. pbw. levels are common in shoe adhesives. Heat reactive tert butyl phenol formaldehyde resins are preferred. These resins react with magnesium oxide to give infusible resins and hence the bond has a better stability at higher temperatures, a property very desirable in the bond as the shoe sole can become hot while walking on the hot road.

3 pbw Magnesium oxide (i.e. 10% on the weight of the resin used) is for the reaction with the resin. The remaining magnesium oxide viz. 2 pbw and Zinkoxyd aktiv 1 pbw act as acid acceptors in the adhesive to absorb any traces of hydrochloric acid formed due to the degradation of the polymer because of ageing. Fine particle size varieties of the oxides are used to delay the settling of the oxides during storage.

Solvent system used determines not only the cost but also the performance characteristics of the adhesives. A true solvent like toluene gives a long tack life but gives a slower rate of settling of the adhesive. Generally a mixture of true solvent and a pseudosolvent (a mixture of solvents which are individually nonsolvents for Baypren but dissolve Baypren when in combination e.g. Ethyl acetate plus petroleum solvent in 1 : 1 proportion) is used. The system given—toluene : ethyl acetate : petroleum naphtha in 1 : 1 : 1 proportion—is quite often used.



Performance characteristics of the Baypren Adhesives :

1. Viscosity : Binder content in the adhesive is the important criteria. However, viscosity of the adhesive determines the processing characteristics of the adhesive e.g. brushability, sprayability etc., and can some times affect the bond strength achieved. For instance on a porous surface like polywood, too thin adhesive may get completely absorbed inside the surface leaving no binder on the surface to achieve the bond.

2. Open tack time or tack-life : The period within which the parts brushed with the adhesives must be brought into contact and pressed together in order to achieve a bond of high strength is known as open tack time. Long tack life is important in assembly shops where the adhesive application and closing are done at two different points and where there is likely to be a long delay in between the two processes.

3. Initial bond strength : One of the advantages of Baypren adhesives is the high strength of the bond immediately after closing. The high immediate bond strength means that on assembly lines the shoe can be immediately put through further assembly operations, if any, without the risk of opening of the bond.

4. Rate of set up : After pressing the two parts together during the storage, Baypren in the adhesive film crystallizes. This molecular rearrangement of the polymer leads to greater intermolecular cohesive forces to become active and the bond strength increases at a rapid rate. A fast rate of set up is essential when, for instance, Baypren adhesive is used for applying microcellular sole to leather upper in the retail shoe shop.

5. Final bond strength : This should be as high as possible. In this paper the effects of *polymer mastication* on the above properties of the Baypren adhesive are investigated.

In the footwear industry the Baypren adhesives are used in the following three ways :

1. Direct bonding : In this method the two parts to be joined together are given a coat of the adhesive and the adhesive coats are allowed to dry. Then the parts are brought together under pressure.

2. Heat activation : In this method the parts are given the coats of adhesive and after evaporation of the solvent are stored. At the time of use,



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the films are activated by means of heat e.g. under infrared light and while still warm pressed together under pressure.

3. Direct bonding after addition of Desmodur R : The normal Baypren adhesive is nonvulcanizing type. When better stability of the bond at higher temperature is desired, Desmodur R is added to the adhesive. In adhesives containing heat reactive alkyl phenolic resin, Desmodur R is used at a level of 3 parts by weight per 100 parts by weight of adhesive. Higher additions of Desmodur R can lead to loss of flexibility in the bond. After addition of Desmodur R to the adhesives, the adhesive is used normally as in the first method given above.

The testing of adhesives was carried out by using these three methods of use.

### Experimental details :

In early stages of the investigations, neolite type rubber soling was selected as adherend surface, but failure occurred in the rubber at an early stage when the bond strength as judged by peel adhesion test was above kgf/cm. Therefore 28 oz. unsized duck was selected as the adherend. The adhesive used was also diluted with more solvent to achieve a better penetration in the fabric. The formulation used was :

TABLE II

	<i>Parts by weight</i>
Baypren 320 or 330	100
Alkyl phenolic Resin (Hylac 6411)	30
Light Magnesium oxide	5
Zinkoxyd aktiv	1
Toluene	180
Ethyl acetate	180
Petroleum-solvent SBP 55/115	180
Water	0.5

### Pre-reaction of the resin :

The activity of the resin towards magnesium oxide was checked. The resin was dissolved in toluene, water and magnesium oxide were added and the contents were stirred. After definite time intervals, aliquots of the solutions were taken out and filtered. The filtrate was evaporated and the ash content of the resin was determined. The results are given in Table 3.



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TABLE III

<i>Time of Reaction</i>	<i>% Ash content of Resin</i>
One hour	4.57
Two hours	5.3
Four hours	5.6
Seven hours	6.1
Twenty-four hours	6.4
Forty-eight hours	6.4

Time of 24 hours was therefore selected for the prereaction of the resin with magnesia.

#### **Mastication of the polymer :**

600 gms. of the polymer were first passed through 1.5 mm nip of the rolls of a laboratory mill, size 20 cm×45 cm. After 6 passes the rubber was baded on the mill and immediately 12 gms. magnesium oxide was added and the rubber masticated for the required time. Just one minute before the end of the stipulated mastication time 6 gms. of Zinkoxyd aktiv was added to the rubber and mixed. During the entire mastication period the cooling water was kept full on.

The mastication periods selected were 2 minutes, 10 minutes, 20 minutes, 40 minutes and 60 minutes.

#### **Dissolution :**

The masticated rubber was soaked in 1/3rd quantity of solvents (pre-reacted resin solution in toluene plus Ethyl acetate plus petroleum naphtha) overnight in the churner. Next day the churner was started and the remainder solvents were added in two instalments. After completion of the dissolution of rubber, the adhesive was taken out and matured for seven days minimum before use.

#### **Measurement of viscosity .**

Viscosity was measured by the following ball metod using a viscometer tube inclined at an angle of 80° to the horizontal.

#### **Measurement of open tack time :**

For measurement of open tack time, the method suggested by Bake (1) was used. Two coats of a resin free Baypren adhesive were applied to 28 oz.



unsized duck with 80 minutes drying period in between the application of the coats. After evaporation of the solvents the cloth was stored in dark for 10 days.

For testing, 8.5 cm × 14.5 cm strips of this coated cloth were used. 1 mm. layer of the adhesive in question was applied on the strips. The strips were kept open for different durations of time then closed with a 2.5 cm × 8.5 cm cellophane paper at one edge and then either rolled by means of a hand roller or pressed under a pressure of 5 kg/cm<sup>2</sup>. After 24 hours the strip was cut into three 2.5 cm. wide strips and the peel adhesion was measured by mounting the specimen in the tensile testing machine.

### Measurement of Adhesive Performance Characteristics :

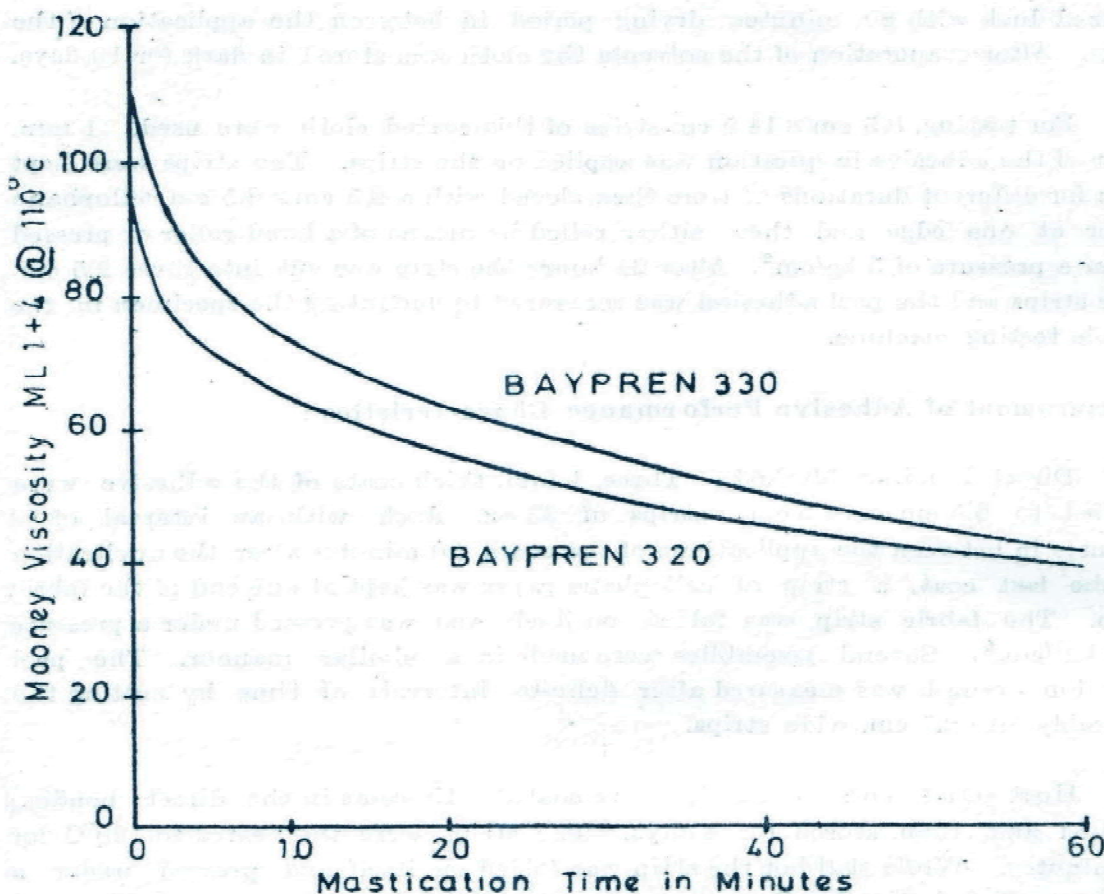
**Direct Bonding Method :** Three 1 mm. thick coats of the adhesive were applied to 8.5 cm. × 14.5 cm. strips of 28 oz. duck with an interval of 30 minutes in between the applications of the coats. 30 minutes after the application of the last coat, a strip of cellophane paper was kept at one end of the fabric strip. The fabric strip was folded on itself and was pressed under a pressure of 5 kgf/cm<sup>2</sup>. Several assemblies were made in a similar manner. The peel adhesion strength was measured after definite intervals of time by cutting the assembly into 2.5 cm. wide strips.

**Heat activation :** The strips were coated 3 times as in the direct bonding method and then stored for 4 days. The strips were then heated to 120°C for 10 minutes. While still hot the strip was folded on itself and pressed under a pressure of 5 kgf/cm<sup>2</sup>. Several such assemblies were made and the peel adhesion was tested after definite intervals of time.

**Direct bonding after addition of Desmodur R :** Desmodur R was added at a level of 3% on the weight of the adhesive to the adhesive and thoroughly mixed. The adhesive was used on the same day. The method used for making the test pieces was the same as used in the direct bonding method.

### Discussions of the results :

**Viscosity of the adhesive :** Figure 2 shows the mooney viscosity of the polymers as a function of the mastication time. 6 passes through the nip and two minutes mastication has brought down the mooney viscosity (ML 1+4 @ 100°C) of Baypren 320 from the original value of 95 to 77 and that of Baypren 330 from 110 to 96. Afterwards the degradation is more prominent in Baypren 330 and after 60 minutes breakdown, the mooney viscosities of the polymers have become nearly equal. Due to the wide nip (1.5 mm) used and because of the



**Fig.2 Effect of mastication on mooney viscosity of the polymer**

fact that polymer has not been allowed to cool during mastication, the mooney viscosity has not gone down to lower extent. Figure 3 shows the viscosity of the adhesives made from the polymers masticated for various time intervals. The viscosity of the adhesive falls down as the mastication time is increased.

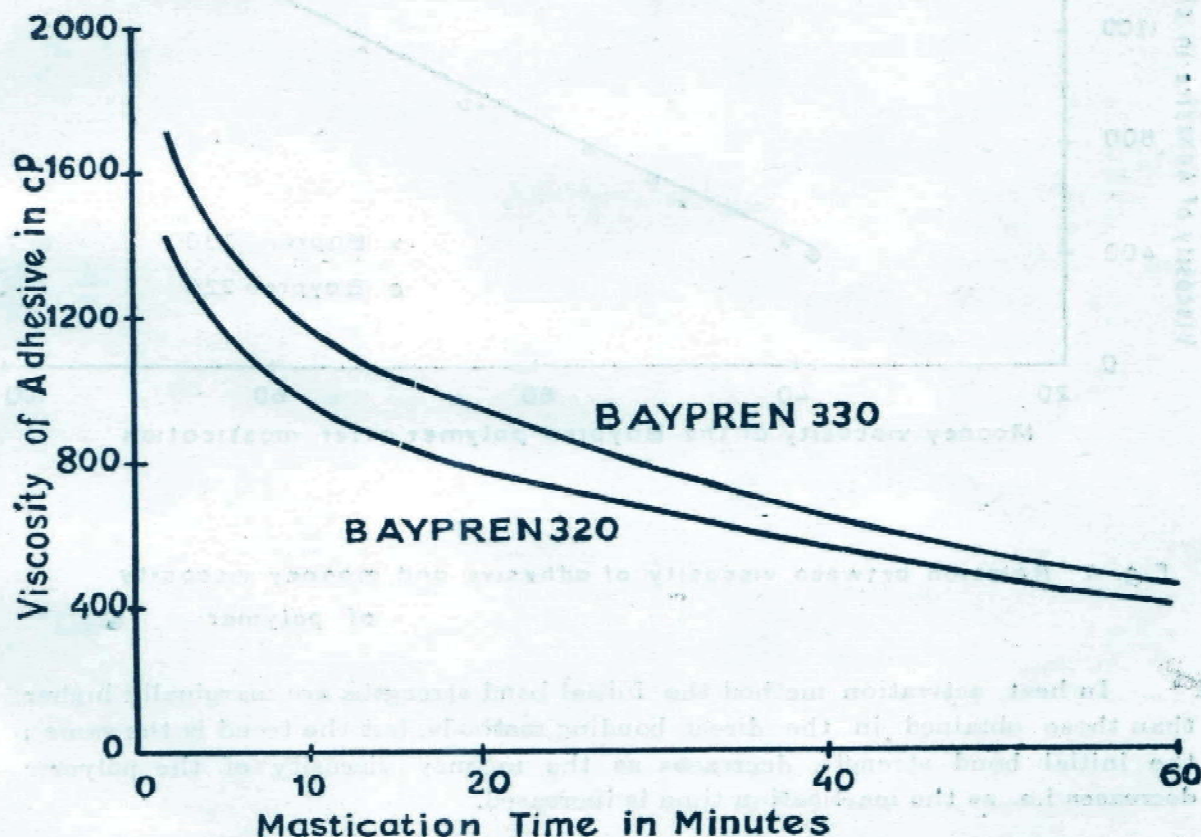
If the viscosities of the adhesives are plotted as a function of mooney viscosity of the polymer a single relationship is obtained for both the polymers (Figures 4).

**Open tack time:** This property is dependent on the pressure applied. This is also influenced by the temperature and relative humidity of the environment.



Figure 5A shows a typical curve for the peel strength values on the assemblies closed using only the roller pressure. It is evident that for such use the tack life of the adhesives is limited. If a value of 6 kg/cm is arbitrarily chosen as a satisfactory value for the adhesion strength and the maximum open time for each adhesive which gives this value of adhesion strength is plotted as a function of the mastication time (figure 5B) then it is seen that tack life under low pressure closing conditions increases as the mastication time is increased.

Under high pressure closing conditions it was observed that even upto 7 hours open time, satisfactory bond strength (i.e. above 6 kg/cm) is obtained. Open times greater than 7 hours were not tested.



**Fig. 3 Effect of mastication on viscosity of the adhesive**

**Initial Bond Strength :** Figure 6 shows the initial bond strength achieved with the different adhesives under different methods of use. These are plotted against the mooney viscosity of the polymer,

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In direct bonding method, the trend is clear that the initial bond strength is a direct function of the mooney viscosity of the polymer. The initial bond strength reduces as the mastication time is increased and mooney viscosity of the polymer falls.

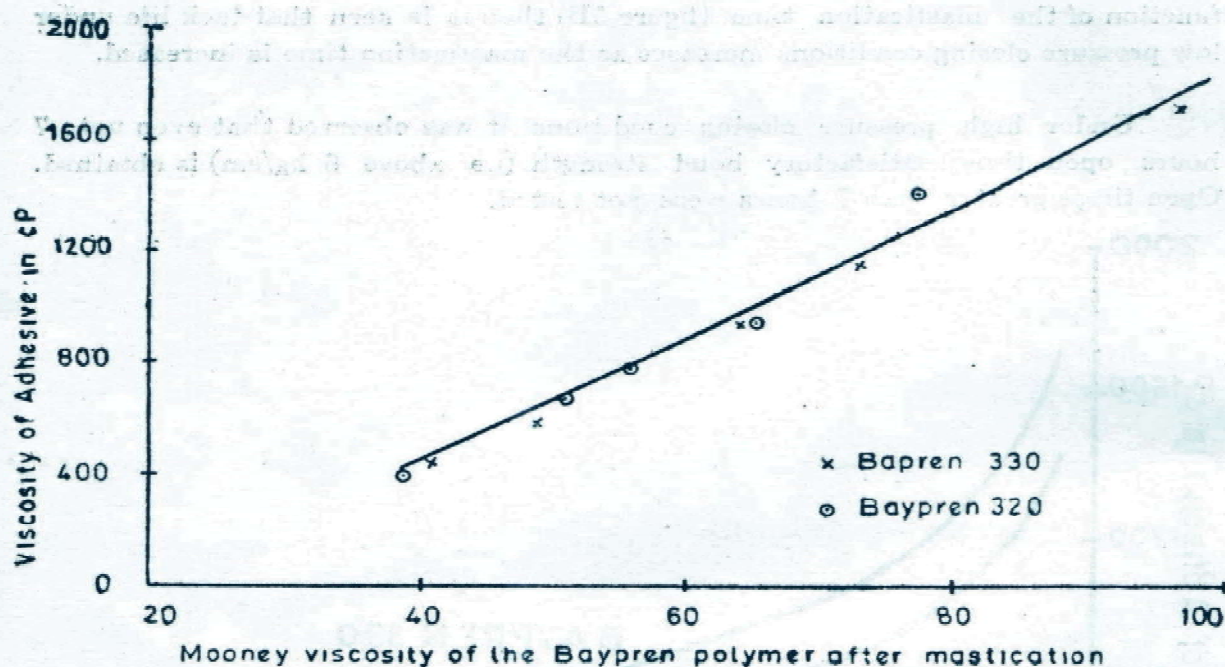


Fig. 4 Relation between viscosity of adhesive and mooney viscosity of polymer

In heat activation method the initial bond strengths are marginally higher than those obtained in the direct bonding methods, but the trend is the same; the initial bond strength decreases as the mooney viscosity of the polymer decreases i.e. as the mastication time is increased.

Surprisingly this trend is not evident so clearly when the adhesives are used with Desmodur R. The reason may be that with Desmodur R addition, the set up is fast and hence during the half hour drying period in between the coats some set up occurs. Thus with Desmodur R the drying period should be minimum. The rapid set up in case of adhesive with Desmodur R can be seen if we compare the one hour adhesion values (Table 4.)



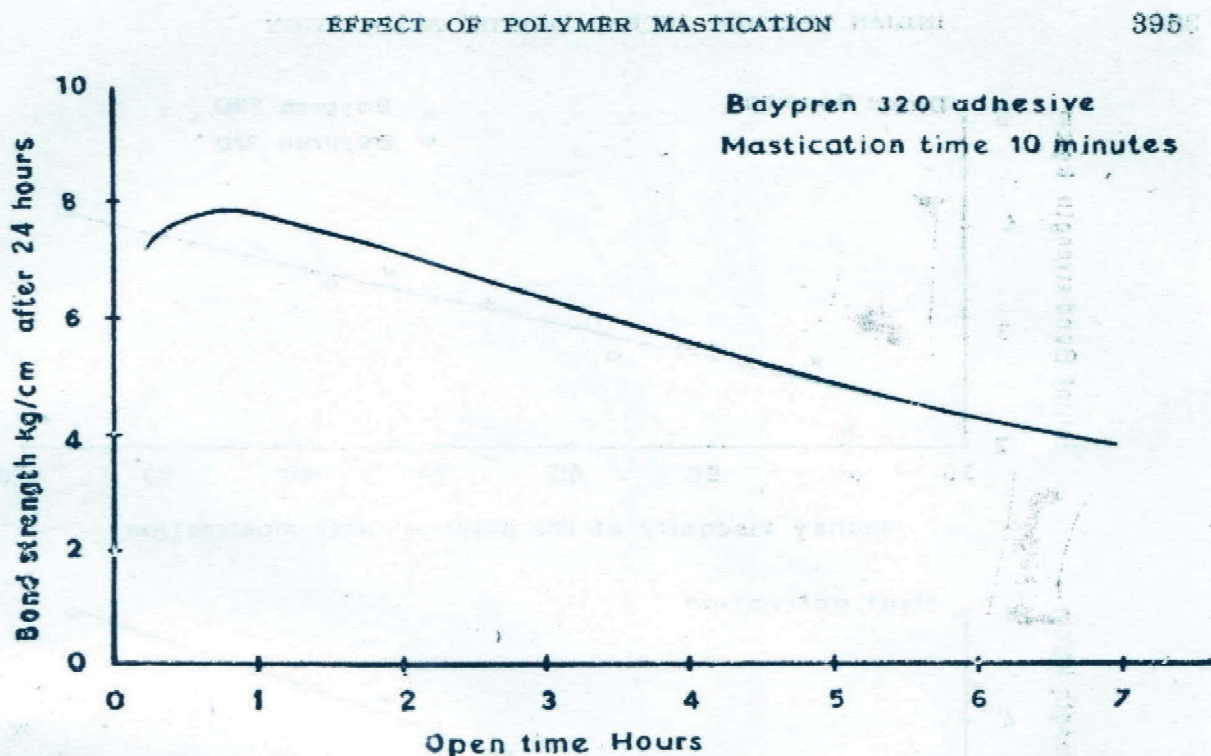


Fig. 5A A typical curve for determination of open tack time closing by hand-roller pressure

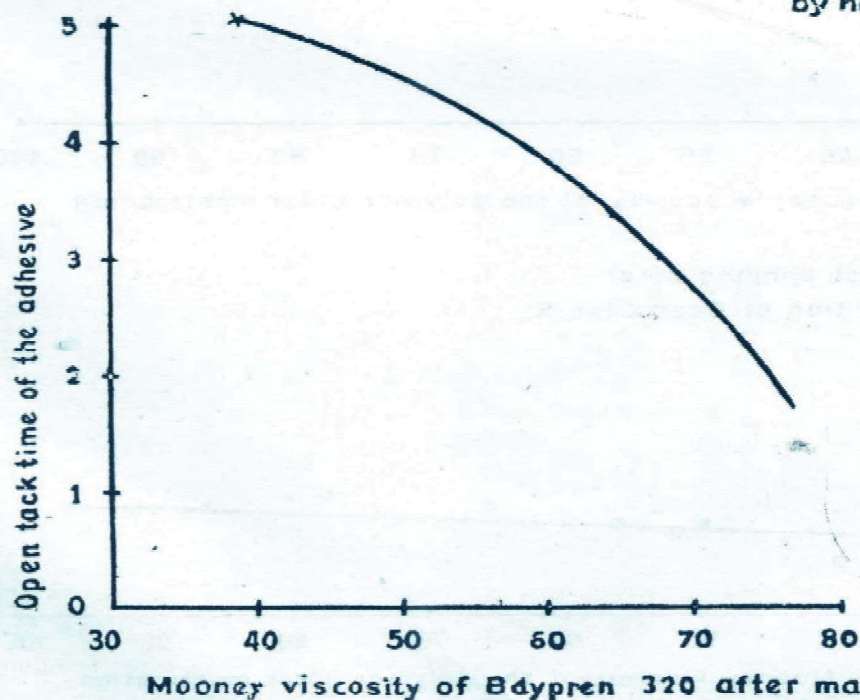


Fig. 5B Dependence of open tacktime on the mooney viscosity of the polymer after mastication

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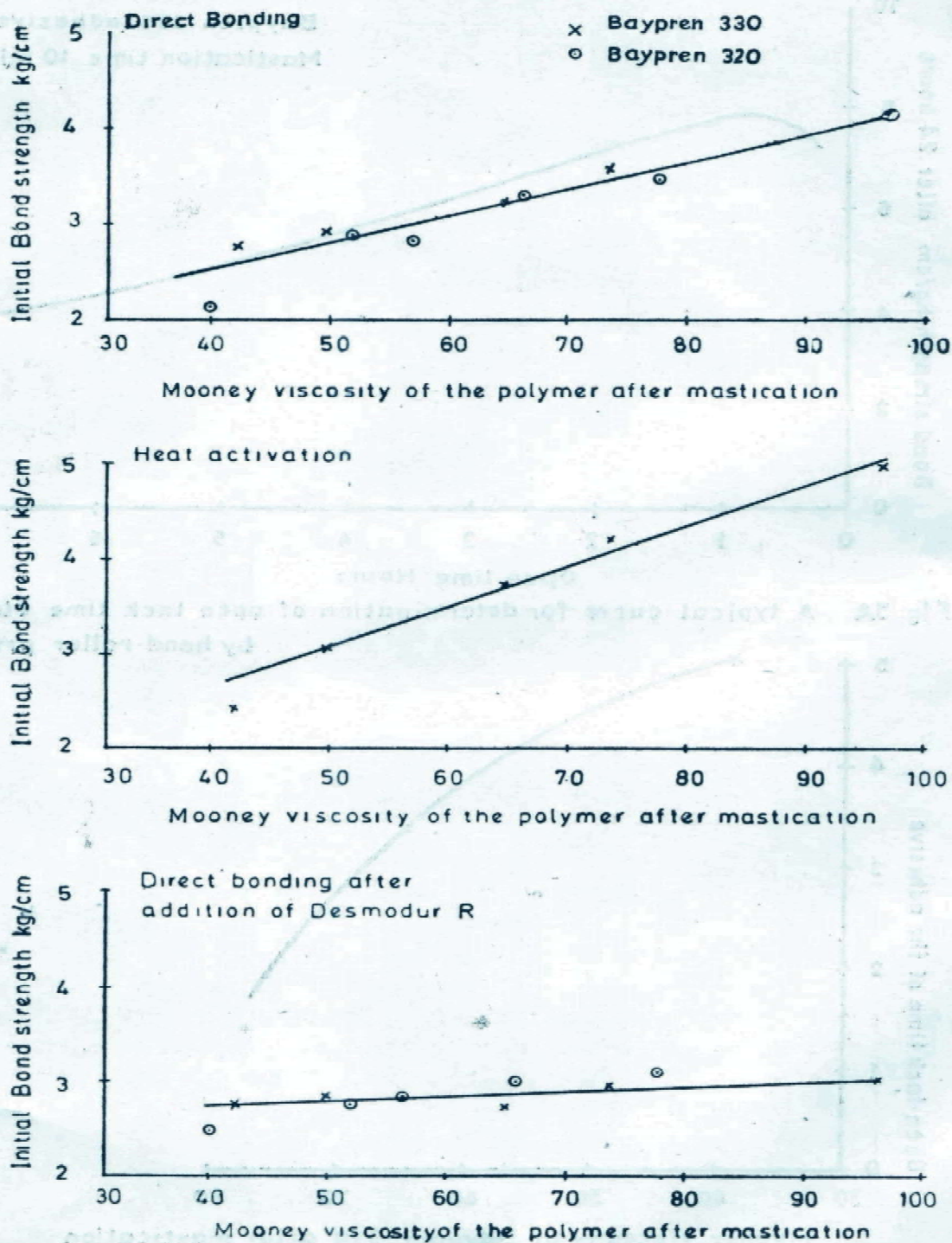


Fig. 6 Dependence of Initial Bond strength on Mooney Viscosity of Polymer after mastication.

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TABLE VI

Peel Adhesion	Values	kg/cm	(one	hours	after	closing
Mastication time-minutes	2	10	20	40	60	
Baypren 320 :						
Normal Adhesive	4.16	3.76	3.32	3.16	2.8	
Adhesive with Desmodur R	5.28	5.6	5.76	5.84	6.0	
Baypren 330 :						
Normal Adhesive	4.72	4.16	3.8	3.44	3.6	
Adhesive with Desmodur R	5.6	5.68	5.8	6.2	6.16	

Rate of Set Up : The set up of Baypren adhesives is due to the fact that below 70°C fast crystallizing Bayprens will start crystallizing. The rate of crystallization will depend on the temperature. Experiment for one type of Baypren rubber were completed at one time but since the adhesives from the other polymer were tested under other environmental temperature, the results from the two polymer series differ to some extent.

Figure 7 shows two typical curves showing the increase in bond strength during storage.

If the rate of set up is taken as the time to attain an arbitrary high value of adhesion strength say 8 kg/cm. a distinct effect of the effect of mastication time is noticeable. Figure 8 shows this relationship.

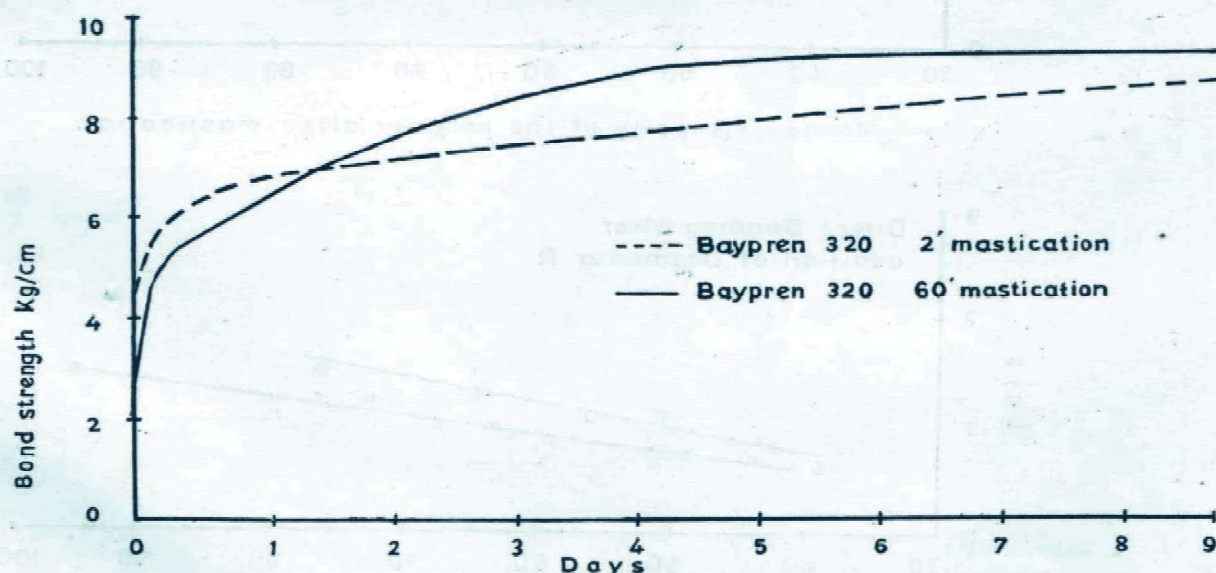


Fig. 7 Typical curves showing the increase in bond strength during storage.



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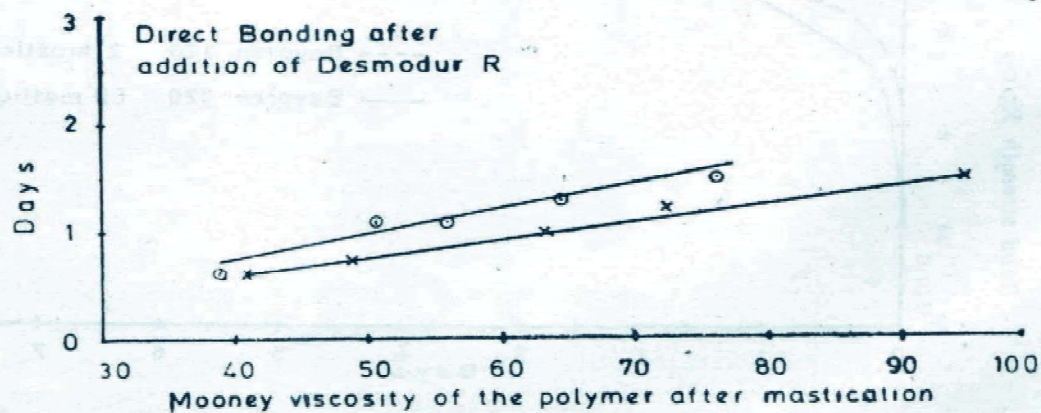
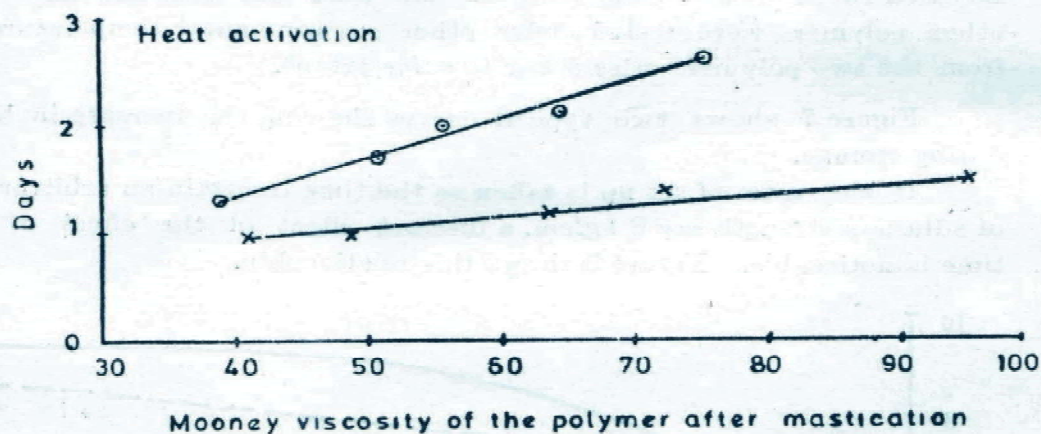
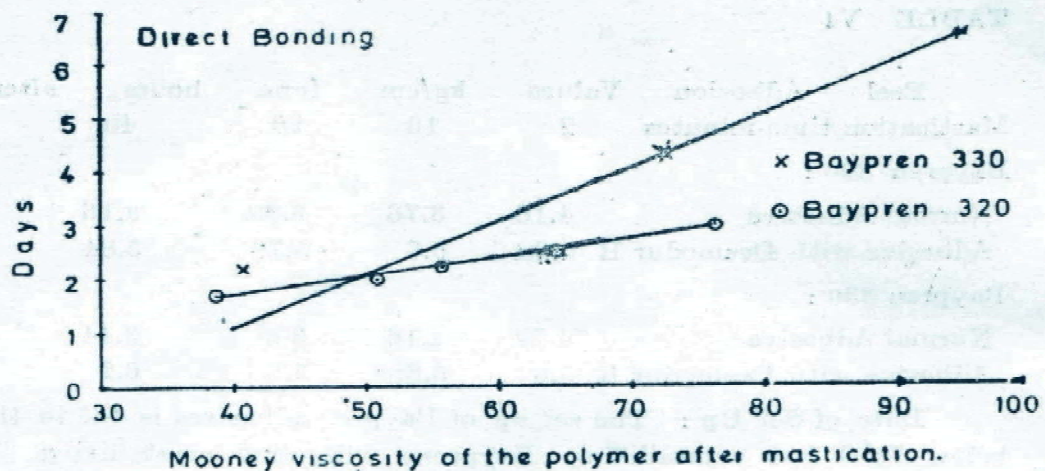


Fig 8 Dependence of rate of set up on Mooney Viscosity of the polymer.



EFFECT OF POLYMER MASTICATION

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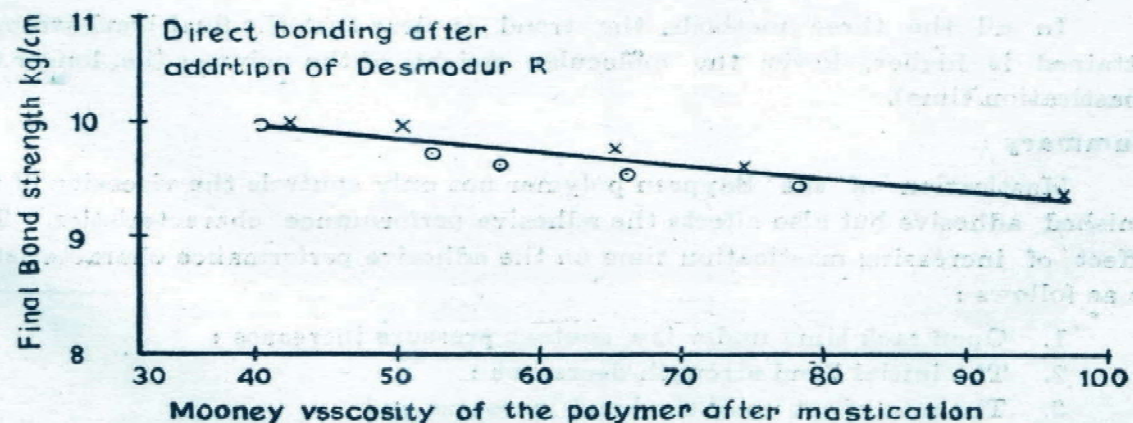
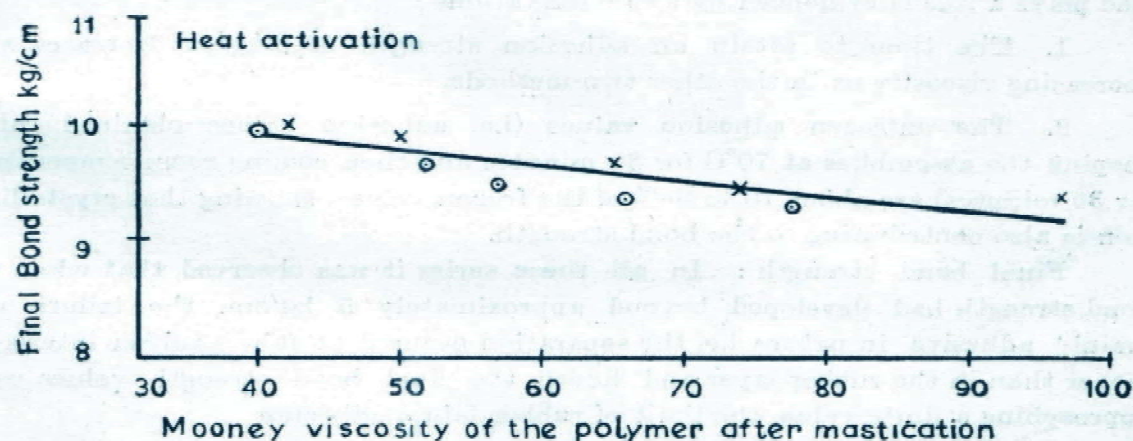
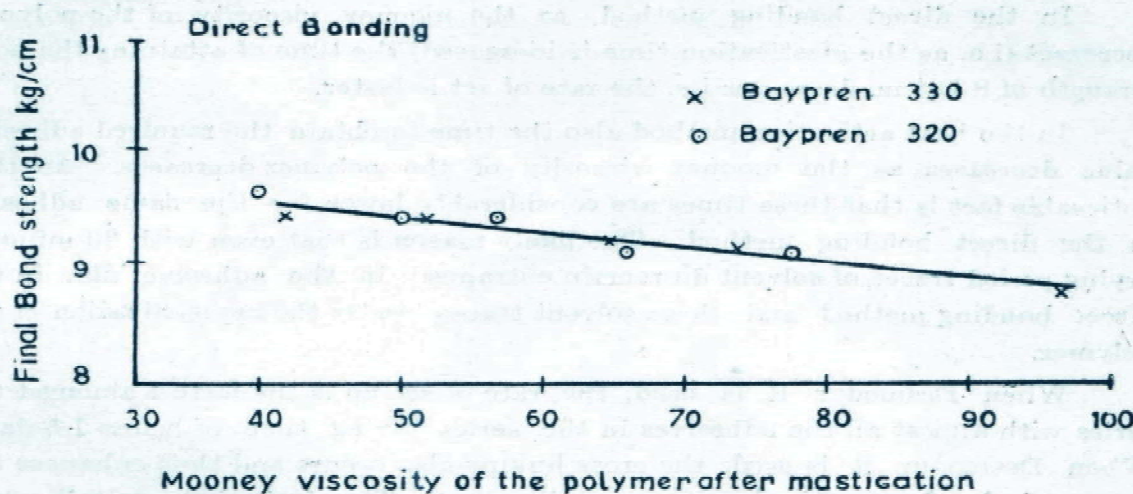


Fig. 9 Dependence of the Final Bond strength on Mooney Viscosity of polymer

In the direct bonding method, as the mooney viscosity of the polymer decreases (i.e. as the mastication time is increased) the time of attaining the bond strength of 8 kg/cm. decreases i.e. the rate of set is faster.

In the heat activation method also the time to obtain the required adhesion value decreases as the mooney viscosity of the polymer decreases. Another noticeable fact is that these times are considerably lower for the same adhesive in the direct bonding method. The likely reason is that even with 30 minutes drying period traces of solvent do remain entrapped in the adhesive film in the direct bonding method and these solvent traces hinder the crystallization of the polymer.

When Desmodur R is used, the rate of set up is the fastest amongst the series with almost all the adhesives in the series giving time of below 1.5 days. When Desmodur R is used, the cross linking also occurs and thus enhances the increase in bond strength due to crystallization. The fact that crystallization also plays a role is evidenced by two observations :

1. The time to attain an adhesion strength of 8 kg/cm decreases with decreasing viscosity as in the other two methods.
2. The unfrozen adhesion values (i.e. adhesion values obtained after keeping the assemblies at 70°C for 30 minutes and then cooling room temperature for 30 minutes) are about 70 to 80% of the frozen values, showing that crystallization is also contributing to the bond strength.

**Final bond strength :** In all these series it was observed that when the bond strength had developed beyond approximately 5 kg/cm. the failure was mainly adhesive in nature i.e. the separation occurred at fabric-rubber interlayer rather than in the rubber layer and hence the final bond strength values were approaching a finite value, the limit of rubber-fabric adhesion.

Figure 9 shows the final bond strengths attained as a function of the mooney viscosity of the polymer.

In all the three methods the trend is clear that the final bond strength attained is higher, lower the molecular weight of the polymer (i.e. longer the mastication time).

#### **Summary :**

Mastication of the Baypren polymer not only controls the viscosity of the finished adhesive but also affects the adhesive performance characteristics. The effect of increasing mastication time on the adhesive performance characteristics is as follows :

1. Open tack time under low contact pressure increases :
2. The initial bond strength decreases :
3. The rate of set up of the bond increases and
4. The final bond strength increases.



### BUDGET WON'T ENSURE ECONOMIC RECOVERY



By any economic theory or doctrine, this is no Budget that supports economic recovery, whether through supporting aggregate demand, or through expansionary stimulus, declares Rathin Roy.

I was hopeful, if somewhat perplexed, by the assertion in the Economic Survey that there was enough fiscal space to ramp up capital spending. If true, this would mean that the government had found a way out of the ongoing fiscal crisis that I have been highlighting since 2019. My analysis of the macro fiscal scenario in the 2022-2023 Budget, unfortunately, shows that the fiscal crisis continues to cripple the Centre's public finances.

Net tax revenues in FY22 (Rs 2.2 trillion) are higher than the budgeted target of 7.6 per cent of GDP, but this is expected to fall to 7.5 per cent in FY23. This continues to be lower than the 8 per cent of THE GDP target that the government has been setting (and failing to achieve) since FY18.

Since the beginning of the growth slowdown, divestment receipts have been low despite the government repeatedly seeking to ramp up such receipts to mobilise resources for public expenditure. In FY22, the government is Rs 1 trillion short of its target, and has in addition incurred capital expenditures to absorb some of Air India's liability.

So, this government is consistently unable to either tax or divest in line with its own ambition ever since the growth slowdown commenced in FY17.

The fiscal crisis is now in its fourth year.

At best, one can say that the finance ministry has acknowledged its own incompetence at resource mobilisation and lowered its tax, non-tax and divestment targets accordingly. But admission of incompetence by moderating FY23 revenue and divestment projections, and boasting about fiscal space in the Economic Survey do not serve to solve the nation's continuingly precarious fiscal situation.

I have been pointing out that total expenditure has been constrained in the pre-pandemic years. In FY21, the government responded to the pandemic by increasing expenditure by 4.6 per cent of GDP, which was exactly equal to the increase in the fiscal deficit/GDP ratio. In FY22, total expenditure has shrunk by a whopping 1.5 per cent of GDP.

The fiscal deficit has shrunk by 2.3 per cent of GDP in the same period. Thus, the modest incremental revenues have been used to reduce the fiscal deficit, not to increase public expenditure to 'stimulate' the economy as so many pundits seem to be saying on television.

To see this, imagine if divestment receipts had been on target and had fully financed the increase in capital expenditure.



If this is not an expansionary Budget, then what is one to make of all the noise about increased capital expenditure? It is certainly true that capital expenditure allocations have increased from 1.65 per cent of GDP in FY20 to 2.16 per cent in FY21 to 2.6 per cent in FY22 and projected to rise to 2.9 per cent in FY23.

This rise is consistent and means that less than 60 per cent of the fiscal deficit will be used to finance revenue expenditure in



FY23 compared with 71.4 per cent in FY20. This is a structural change in fiscal stance. But, contrary to the braggadocio in the Economic Survey, this has come about through revenue expenditure compression, and not through an increase in resource mobilisation, which is why the capital expenditure/GDP ratio has increased even though the total expenditure/GDP ratio has shrunk.

The quality of revenue expenditure is poor. Interest payments continue to rise inexorably. Committed expenditure (the sum of establishment expenditure, goods and services tax cess, interest on debts and finance commission grants) has risen from 6.9 per cent of GDP in FY20 to 7.9 per cent in FY22.

The government continues to increase its subsidy allocation with food and fertiliser subsidies amounting to 1.2 per cent of GDP in FY23 compared with 0.93 per cent of GDP in FY19. The Mahatma Gandhi National Rural Employment Guarantee Act outlays have shrunk dramatically from Rs 1.1 trillion in FY20 to Rs 73,000 crore in FY23 despite 7.1 million households being unable to access the programme on demand in FY22.

This is disgraceful for a government that has only this to show to alleviate the scarring caused by the Covid-induced economic collapse. Equally disgraceful, National Health Mission allocations in FY22 were lower than in FY20. The increase in public capital expenditure has, therefore, happened despite shrinking total expenditures by compressing revenue expenditure on public goods. The government has seen fit to subsidise more but allocate less for much needed public employment.

By any economic theory or doctrine, this is no Budget that supports economic recovery, whether through supporting aggregate demand, or through expansionary stimulus. In effect, all that it has done is substitute for the lowered private capital spending, despite the extraordinarily rise in profits that the few listed companies have enjoyed even as they have produced and sold less output over the course of the pandemic.

For the rest, the finance minister's speech continued with the unpleasant new tradition of keeping the discussion on the macro and fiscal framework as short as possible, listing a series of trivial announcements on custom duties, and other general irrelevances, and a strangely vague announcement on sovereign Green Bonds that was devoid of any discernible operational content.

I hope this is not yet another backdoor attempt by those in the government who seem to hanker after the privilege of being indebted to foreigners, to introduce foreign sovereign borrowing. It is welcome that there are measures to ease the tyranny on personal tax payers, and some belated attempts to correct anomalies in corporate taxation.

But these things are handled by executive announcement, which, for some reason, take up huge space in India's one annual fiscal policy presentation. It is unfortunate that since FY21, the government has had no forward looking medium-term macroeconomic framework or fiscal road map published with the Budget documents, which makes its claim that this Budget presented a 25-year blueprint all the more fatuous.

Empty rhetoric and noise may serve many posturing arms of government well, but the finance ministry has to deploy analysis and reasoned argument to restore its fiscal policymaking credibility that has been steadily eroding for some time now.

### INDIA AMONG ECONOMIES WORST-HIT FROM UKRAINE CRISIS: NOMURA



Every 10 per cent rise in crude oil price will shave off around 0.2 percentage point (pp) from India's GDP growth and widen the current account by 0.3 per cent, says Nomura.

The ongoing geopolitical crisis between Russia and Ukraine will impact Asian economies, but the impact will be polarised across the region, said analysts at Nomura in a recent report. The negative impact on Asia, they believe, is predominantly because most economies are net oil importers, and food and energy accounts for nearly half of the consumption expenditure in EM Asia.

Although the ongoing geopolitical tensions between Russia-Ukraine can hurt Asia through multiple channels, such as tighter global financial conditions, elevated uncertainty and the risk of weaker global demand, higher commodity prices, especially oil, are the most important transmission channel.

“A sustained rise in oil and food prices would have adverse impacts on Asia’s economies, manifested through higher inflation, weaker current account and fiscal balances, and a squeeze on economic growth. In such a scenario, India, Thailand and the Philippines are the biggest losers, while Indonesia would be a relative beneficiary,” wrote analysts at Nomura in the co-authored report.

As regards India, every 10 per cent rise in crude oil price, Nomura said, will shave off around 0.2 percentage point (pp) from the GDP growth and widen the current account by 0.3 per cent. This, it believes, could add to growth uncertainties, as the country navigates an uneven recovery, and counters near-term tailwinds like higher public capex, services normalisation and easy financial conditions.

Inflation projections, too, rise in tandem with flaring oil prices and typically a 10 per cent rise in crude oil fans 0.3-0.4 pp rise in headline inflation. According to Dr. Soumya Kanti Ghosh, group chief economic adviser State Bank of India, there appears to be an upside risk of 90-100 bps to RBI’s inflation of 4.5 per cent for FY23 if oil price averages to \$90/barrel; and 100-130 bps upside if oil price averages to \$100/barrel. Crude oil prices shot past \$100 a barrel mark for the first time since 2014 to hit a high of \$105 a barrel — up 21 per cent in the past one month alone. Meanwhile back home, the government has kept auto fuel (petrol & diesel) prices unchanged since November as a populist measure given the impending assembly elections across five key states.

“The recent crude oil spike could result in Rs 6-8/litre hike in auto fuels, once the state elections get over in early March. These hikes would add about 30-40bps to the CPI. Potentially higher CPI might drive the Reserve Bank of India (RBI) to change its dovish stance over the next one-two quarters,” wrote Mahesh Nandurkar, managing director at Jefferies in a co-authored note with Abhinav Sinha.

Those at Nomura, too, expect around a 10 per cent hike in petrol and diesel prices post the state elections. The hike in LPG prices, they expect, will be steeper.

### Advantage Indonesia

While most Asian economies are likely to suffer due to the ongoing conflict, Indonesia, Nomura believes, will benefit despite being a net importer of crude oil. A 10 per cent rise in oil prices, they said, will widen Indonesia’s current account deficit (CAD) by 0.2 per cent of GDP at a time when less stringent mobility curbs this year are allowing people to travel more and subsidized retail prices are leading to higher fuel consumption and oil imports.

“However, the impact of higher oil prices would likely be fully offset by surging prices of non-oil commodities, such as crude palm oil, coal and LNG, resulting in a net neutral impact on the CAD. We also expect a limited direct impact on headline inflation, as the government will likely maintain fuel subsidies,” Nomura said.

(Source : Rediff.com – 26/02/2022)

### INFLATION TO OVERSHOOT RBI TARGET ON OIL PRICE SPURT; FY23 PROJECTION BETWEEN 4.7% AND 5.2%



Russia’s invasion on Ukraine on Thursday caused prices to spike above \$100 a barrel for the first time since 2014, with Brent hitting over \$105. On Friday, the April Brentfutures contract shed 79 cents, or 0.8%, at \$98.29 a barrel in intraday trade. Still, the market remains jittery amid uncertainties.

The rise in oil prices in the wake of the Russia-Ukraine conflict can potentially push up retail inflation beyond the level estimated by the monetary policy committee (MPC) earlier this month if the crisis lingers on, economists reckoned.

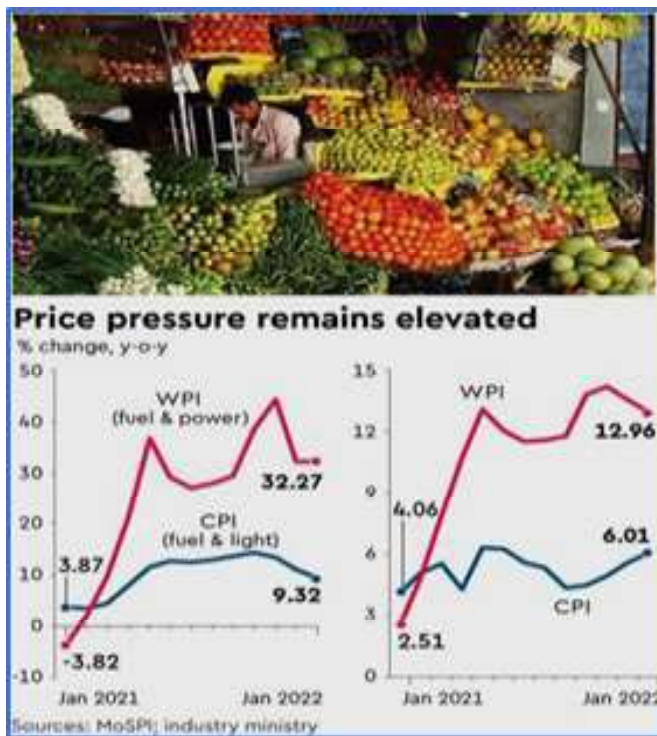
Some analysts have projected FY23 retail inflation to range between 4.7% and 5.2%, higher than the monetary policy committee's (MPC's) estimate of 4.5%. If the crisis continues for a month or so, there are upside risks to these projections as well. However, any tightening of the interest rate at this stage or early next fiscal to curb price pressure may be counter-productive, some of them said. Nevertheless, if oil prices continue to soar causing inflationary pressure to spike, the central bank may choose to respond.

Pronab Sen, former chief statistician, told FE that while elevated oil prices inflate the cost of goods and services, at the same time "it has a deflationary tendency because a bigger chunk of ordinary household budget has to be shifted towards fuel consumption from other less essential items". "This can actually be self-limiting unless there is a generalised inflationary momentum that gets set off essentially through higher wages. A contractionary monetary policy, in such a case, may make it worse. Such a policy is appropriate when inflation is essentially demand-driven, but when it's cost-push, you have to be very careful in tightening the monetary policy," Sen said.

Sudipto Mundle, emeritus professor at the National Institute of Public Finance and Policy, said the crisis will have a "disruptive impact" on the markets. Oil prices are going to exacerbate price pressure. While RBI decided to be accommodative earlier this month, but if oil prices keep rising, it may "decide to do some adjustments (to key rates)", he added.

According to Sonal Varma and Aurodeep Nandi of Nomura, a 10% rise in crude oil prices typically leads to a 0.3-0.4 percentage point (pp) rise in headline inflation, shaves off about 0.20pp from GDP growth and widens the current account deficit by 0.3% of GDP. This could make India among the biggest losers in Asia in this crisis, they said.

"Even in the absence of the current geopolitical tensions, we believe this (MPC's projection for FY23) grossly underestimates the upside risks to inflation over coming months. We believe higher crude oil and food prices are likely to further frustrate the RBI's inflation outlook and necessitate a hawkish pivot in the middle of the year, in acknowledgement of these upside risks," the analysts at Nomura said. "We maintain our outlook for 100bp of policy repo rate hikes in 2022, starting in June," they added.



Russia's invasion on Ukraine on Thursday caused prices to spike above \$100 a barrel for the first time since 2014, with Brent hitting over \$105. On Friday, the April Brentfutures contract shed 79 cents, or 0.8%, at \$98.29 a barrel in intraday trade. Still, the market remains jittery amid uncertainties.

Icra chief economist Aditi Nayar said retail inflation is likely to be very sticky in February, remaining around the upper threshold (6%) of the MPC. The rabi harvest projections and reservoir levels suggest a relatively benign outlook for food inflation. "However, the impact of the escalation in the Russia Ukraine conflict on global commodity prices remains unclear, especially in the context of the anticipated start to tightening by the Federal Reserve," Nayar said. "Similarly, whether crude oil sustains above \$100/barrel and when/how soon/by how much excise duty on fuels is cut, remain to be seen. We see an upside to our FY23 CPI inflation forecast of 5%," she said.

DK Pant, chief economist at India Ratings, said if the conflict stretches on, it will cause global commodity prices, especially of petroleum products, to rise. In such a case, inflation will overshoot the MPC projection. Before the crisis, Pant had estimated retail inflation to average 4.9% in FY23, against 5.4% this fiscal.

(Source : Financial Express – 26/02/2022)



### FDI EQUITY INFLOWS DIP 16% DURING APR-DEC TO \$43.17 BN



Foreign direct investment (FDI) equity inflows into India contracted by 16 per cent to \$43.17 billion during the April-December 2021 period, according to data from the Department for Promotion of Industry and Internal Trade (DPIIT).

The inflows had stood at \$51.47 billion during the corresponding period of the previous year. The total FDI inflows (which includes equity inflows, re-invested earnings and other capital) aggregated at \$60.34 billion during the nine-month period of the current fiscal year as against \$67.5 billion in the year-ago period.

The equity inflows in the third quarter of this fiscal (October-December 2021) also declined to \$12 billion as against \$21.46 billion in the corresponding period of 2020, the data showed. The total FDI inflows fell to \$17.94 billion during the third quarter as against \$26.16 billion in the year-ago period.

During April-December 2021, Singapore was at the top with \$11.7 billion worth of investments. It was followed by the US (\$7.52 billion), Mauritius (\$6.58 billion), Cayman Islands (\$2.74 billion), Netherlands (\$2.66 billion) and UK (\$1.44 billion).

The computer software and hardware sector attracted the highest inflows of \$10.25 billion during the nine-month period of this fiscal.

It was followed by the automobile industry (\$5.96 billion), services sector (\$5.35 billion), construction (infrastructure) activities (\$1.6 billion) and pharma (\$1.2 billion), the data showed.

(Source : PTI – 24/02/2022)

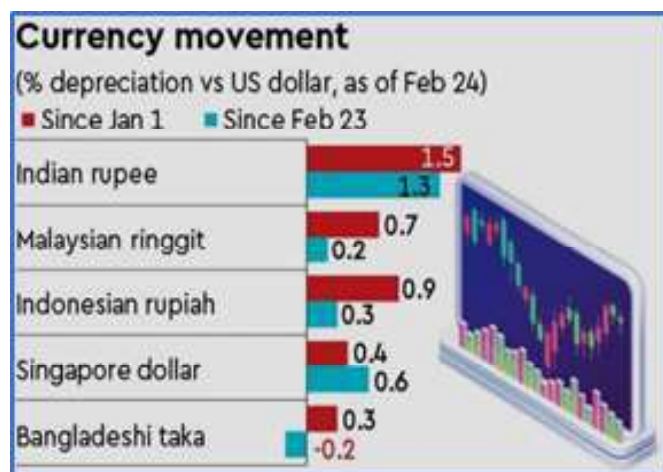
### RUPEE FALL TO HELP BUT STABLE CURRENCY DESIRABLE: EXPORTERS



A sustained depreciation of the rupee against the greenback in the wake of the Russia-Ukraine crisis will help exporters considerably in sectors where reliance on imported raw materials is limited. However, the sectors (including petroleum, gems and jewellery and electronics) where domestic value addition is limited, may have only limited relief, trade experts and exporters told FE.

But if the domestic currency sees sharp volatility, as it has in the past two days, the gains could be negated. Benefits to domestic exporters also hinge on the movement of currencies of India's competitors in the global market.

The domestic currency had weakened by about 1.5% against the dollar this year until Thursday, when Russia undertook military operations in Ukraine. However, the rupee pared some losses on Friday and gained 0.6%. Still, the domestic currency has weakened slightly more this year, against those of some other nations (see the chart).



Importantly, according to the RBI's real effective exchange rate (REER) index, based on the export-weighted average of about three dozen currencies, the rupee was "over-valued" by over 4% in January. Ajay Sahai, director general and chief executive at apex exporters' body FIEO, said: "While, as a thumb rule, the rupee depreciation will help our exporters, at the same time, we have to see the level of depreciation of the currencies of those countries that we compete with in the export market."

Noted textiles expert DK Nair said the depreciation, if sustained, will "help our exporters, especially in sectors like textiles and garments where our dependence on imported raw materials is minimal". Raja M Shanmugham, president of the Tirupur Exporters' Association, too, concurred with the view. The rupee depreciation will help only if it sustains for a longer period. Mahesh Desai, chairman of the engineering exporters' body EEPC, said the impact of currency depreciation will come with a time lag.

Merchandise exports can potentially cross the ambitious target of \$400 billion set for the current fiscal, commerce and industry minister Piyush Goyal had said on Thursday. Exports had shrunk 7% in FY21 from a year earlier to \$292 billion in the wake of the pandemic. However, global demand for goods improved dramatically this fiscal following an industrial resurgence in advanced economies.

(Source : Financial Express – 25/02/2022)

### EQUITY M-CAP LOWEST IN 7 MONTHS IN FEB



Equity market capitalisation dropped to a seven-month low in February, with the top 10 companies losing a whopping Rs 3,33,307.62 crore in market valuation last week.

The total equity market capitalisation (m-cap) in February 2022 stood at Rs 2,49,97,053.39 crore. The previous low was in July 2021, when the m-cap of BSE-listed companies was at Rs 2,35,49,748.9 crore. In January, the m-cap stood at Rs 2,64,41,207.18 crore.

During the week, equity m-cap was Rs 2,57,39,712.95 crore on Monday and was at its lowest on Thursday, at Rs 2,42,24,179.79 crore, the day Russian President Vladimir Putin announced a military operation in Ukraine. On a weekly basis, Reliance Industries Ltd's market valuation dropped Rs 94,828.02 crore to reach Rs 15,45,044.14 crore.

The market valuation of Tata Consultancy Services (TCS) tumbled Rs 101,760.91 crore to stand at Rs 13,01,955.11 crore. HDFC Bank's market capitalisation tanked Rs 31,597.65 crore to Rs 8,06,931.95 crore.

The valuation of Infosys eroded by Rs 5,501.34 crore to Rs 7,12,443.09 crore and that of ICICI Bank declined by Rs 13,240.66 crore to Rs 5,07,414.1 crore.

The market capitalisation of HDFC plunged Rs 6,929.03 crore to reach Rs 4,35,233.9 crore and that of Hindustan Unilever Ltd (HUL) fell by Rs 33,234.97 crore to Rs 5,09,990.53 crore.

State Bank of India's market capitalisation declined by Rs 29,094.23 crore to Rs 430,924.87 crore and that of Bajaj Finance dipped Rs 3,802.65 crore to Rs 420,653.95 crore.

The valuation of Bharti Airtel diminished by Rs 13,318.16 crore to Rs 378,098.62 crore. In the ranking of the top 10 firms, Reliance Industries Ltd continued to maintain its numero uno position, followed by TCS, HDFC Bank, Infosys, HUL, ICICI Bank, HDFC, SBI, Bajaj Finance and Bharti Airtel.

(PTI - 27/02/2022)

### -: JILTA :-

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# ILTA PUBLICATION

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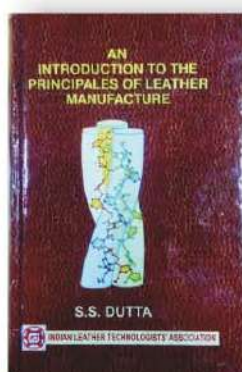
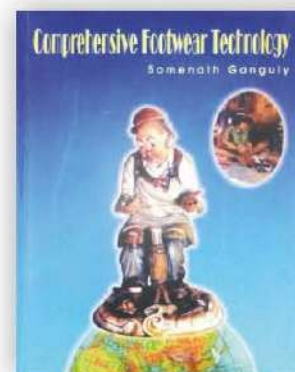
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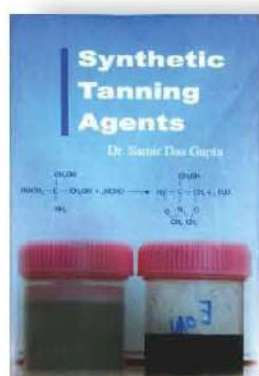
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# History and Activities of Indian Leather Technologists' Association

The Indian Leather Technologists' Association (ILTA) was founded by Late Prof. B. M. Das, the originator of Dea-Sidney theory and father of Indian Leather Science on 14<sup>th</sup> August 1950.

The primary objectives of the oldest Leather Technologists' Association which celebrated its Diamond Jubilee year in the 2010, are :

- ◆ To bring all concerned with the broad spectrum of the leather industry under one umbrella.
- ◆ To organize seminar, symposium, workshop in order to create information, knowledge and latest development for the benefit of all concerned. To offer a common platform for all to interact with each other in order to understand each other's problems and prospects.
- ◆ To publish monthly journal as a supplement to those above objectives. The monthly journal of ILTA is known as Journal of Indian Leather Technologists' Association and is the most widely circulated technical journal concerning leather technology.
- ◆ To publish text books for the benefit of students at various levels of study, for the researchers and industry.
- ◆ To have interface between urban and rural sector.
- ◆ To assist Planning Commission, various Government Institutions, Ministry and autonomous bodies to formulate appropriate policies acceptable and adoptable to the industry.
- ◆ To organize practical training and to provide skilled manpower and to motivate good students for study.
- ◆ To conduct activities related to the growth of the export of leather and leather goods from India.
- ◆ As the part of many social activities ILTA has donated Rs. 1 lac to Consul General of Nepal towards relief of earthquake affected of Nepal on 16<sup>th</sup> Sept, 2015.

## INTERNATIONAL & NATIONAL SEMINAR

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

## SEMINAR & SYMPOSIUM

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

- ◆ Prof. B. M. Das Memorial Lecture every year during the Foundation Day Celebrations on 14<sup>th</sup> August every year.
- ◆ Sanjoy Sen Memorial Lecture on 14<sup>th</sup> January every year, the birthday of our late President for several decades.
- ◆ Prof. Moni Banerjee Memorial Lecture on 16<sup>th</sup> March every year, the birthday of this iconic personality.
- ◆ Seminar on the occasion of India International Leather Fair (IILF) at Chennai in February every year.

It has also organized :

- ◆ Prof. V. Nayudumma Memorial Lecture.
- ◆ Series of Lectures during "Programme on Implementing Emerging & Sustainable Technologies (PriEST)".
- ◆ Seminars on occasion of India International Leather Fair, 2014 and 2015 at Chennai etc. Many reputed scientists, industrialists and educators have delivered these prestigious lectures. Foreign dignitaries during their visits to India have addressed the members of ILTA at various times.

## PUBLICATION

ILTA have published the following books :

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

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

## AWARDS OF EXCELLENCE

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

## LEXPOs

To promote and provide marketing facilities, to keep pace with the latest design and technology, to have better interaction with the domestic buyers, ILTA has been organizing LEXPO fairs at Kolkata from 1977, Siliguri from 1992 and Durgapur from 2010. To help the tiny cottage and small-scale sectors industries in marketing, LEXPO fairs give the exposure for their products. Apart from Kolkata, Siliguri & Durgapur, ILTA has organized LEXPO at Bhubaneswar, Gangtok, Guwahati, Jorhat and Ranchi.

## MEMBERS

The Association's present (as on 31.03.2018) strength of members is more than 600 from all over India and abroad. Primarily the members are leather technologists passed out from Govt. College of Engineering & Leather Technology, Anna University, Chennai, Harcourt Butler Technological Institute, Kanpur, B. R. Ambedkar National Institute of Technology, Jalandhar and Scientists from Central Leather Research Institute.

## ESTABLISHMENTS

In order to strengthen its activities, ILTA have constructed its own six storied building at 44, Shanti Pally, Kasba, Kolkata - 700 107 and have named it "Sanjoy Bhavan".

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



ILTA  
Since 1950

## Indian Leather Technologists' Association

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

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