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ILIFO Newsletter and Journal of Cleaner Tanning

The news items in this limited circulation issue focuses on sustainability issue of leather and allied industries, in line with the objectives of ILIFO. Readers are encouraged to send their views to ilifo@vsnl.com

Performance Evaluation of CETP's

ILIFO has been engaged by VANITEC and SIDCO-I to perform the evaluation of the performance. Under this evaluation, the operations efficiencies of the various unit processes in the CETP were analyzed, starting from primary treatment to the tertiary treatment units. Based on the evaluation, detailed recommendations are provided to the CETP.

Common Facility Centre at Jammu and Kashmir

Tanneries in Lassipora Industrial Growth Centre are processing hides /skins upto wet blue stage. The Lassipora tanners are very eager to process the wet blue leather tanned in their units to finished leather, However upgradation to finished leather manufacture requires additional infrastructure in terms of sophisticated machines and equipment apart from trained technicians, operators and workers and a range of speciality chemicals.

Buying and installing modern machines, which are quite expensive, by individual entrepreneurs who are small operators, will be well nigh impossible. Also, considering the small volume of material processed by each of them, it is not wise for each tanner to create such infrastructure in individual units at this stage of development of the industry.

It is in this background that establishing a Common Facility Centre (CFC), complete with a modern shop floor housing a wide range of machines and equipment necessary in the conversion of wet blue leather to finished leather, in a location within the area earmarked for leather sector in the IGC at Lassipora, has been conceived.

A Memorandum of Understanding was signed by the state of J&K with Council for Leather Exports (CLE) to setup a Common Facility Centre (CFC) at (IGC) Lassipora.

The MOU has highlighted that the future growth of the leather industrial sector in the state will be facilitated by creating, a Common Facility Centre (CFC).

ILIFO as the PMC for the project, visited the site in December 2015, and a DPR was prepared for the CFC estimating the cost of the project as 21.38 crores. And during the visit it was also decided to go for the upgradation of the existing CETP, and for the construction of a SLF for the safe disposal of the sludge generated in the CETP. A separate DPR was prepared for the Upgradation of the CETP and the construction of SLF, the estimated project cost of which was 21.38 crores.



"The CFC will catalyse the development of leather industry in Jammu and Kashmir" - reported Jammu Links News.



XXXIV IULTCS CONGRESS 2017

The Indian affiliate to International Union of Leather Technologists and Chemist Societies (IULTCS) - Indian Leather Technologists Association (ILTA) and CSIR-Central Leather Research Institute would jointly organize the XXXIV IULTCS Congress during 5-8 February 2017.

CONGRESS THEME

“Science and Technology
for Sustainability of Leather”

R & D focus of research institutes, chemical companies and organizations around the world has been the sustainable development of the leather sector. In this scenario, the Congress aims to address the following technological challenges :

- Environmental regulations and public perception about the industry continuing to be negative, how will research enable sustained manufacture?
- How can the trade to be increased with raw material availability remaining more or less constant?
- Ensuring low environmental footprints from the industry.



TECHNOLOGY PAGE

High Pressure - Reverse Osmosis Systems

Reject Management System by Rochem PT(HP)-RO Plant

An article by ROCHEM Separation Systems



OVERVIEW:

The PT(HP)-RO (Plate Tube High Pressure Reverse Osmosis) plant can be applied to treat the RO rejects by increasing the operating pressure of the system in excess to that usually applied in RO plants (>60bars). The design & selection of materials is suitable to enable the plant to operate at higher pressures. **ROCHEM PT RO SYSTEM :** Effluent water at atmospheric pressure cannot naturally diffuse through a semi-permeable membrane to provide fresh water. By applying pressure to the effluent water in excess of the osmotic pressure of the solution recyclable product water can be obtained. This pressure applied is upto 60 bars for the PT-RO system.

ROCHEM PT HP-RO SYSTEM : The rejects however are more concentrated and require a higher pressure for membrane separation. Depending on the concentration of rejects, Rochem offers a 75 bar system (where feed waste water can be concentrated to 70000-75000 ppm TDS) or a 120 bar system (where feed waste water can be concentrated to 100000 ppm TDS).

Objective of Membrane Applications on Tannery Effluents

1. Recycle water from effluent & reduce reject volumes
2. Reduce energy spent for disposal.

The effective management of rejects is becoming ever important with compliance norms getting stringent & ZLD being enforced on larger spectrum of industries for conformity. Current available alternatives for RO reject management for tanneries :

- Concentration by Membranes:** Low Energy Input, Clean Permeate, Proven
- Concentration by Thermal Evaporation:** High Concentration possible (55%), Robust systems, High Energy consumed, System Optimization needed, Condensate needs polishing
- Incineration / Boiler:** Zero Discharge capability, Needs >55% TS at inlet + Support fuel, Bulk of energy is consumed in concentration steps, System optimization required; Ash Fusion temperature concerns

- **Spray Dryer:** Zero discharge potential, High energy input, Dried powder, stability/usage/value optimized

To achieve ZLD, an alternative solution in membrane technology which operates at a higher pressure to recover reusable water from the RO rejects can be adopted.

A few advantages of HP-RO systems over thermal systems are as follows:

Reduction in costs for the thermal systems:

HP-RO system can be applied on existing RO rejects thereby reducing the volume of effluent to be treated for disposal.

Reduction in steam consumption:

As HP-RO gives a more concentrated reject and reduced volumes, the steam consumption is highly reduced.

Lower operating/ treatment cost of HP-RO systems:

As compared to thermal plants as there is lesser power requirement & no steam consumption, treatment costs can be drastically reduced as compared to very high fuel and power cost of thermal systems.

Compact and Modular construction of the membrane system:

Through unique design, versatile features can be achieved like smaller foot print, ease in handling, replicability and isolation in case of fault.

Avoids heavy thermal systems:

Handling higher volumes of RO reject effluents by HP-RO systems is easy & not as troublesome as possible in the case of thermal systems due to frequent mechanical & process failures.

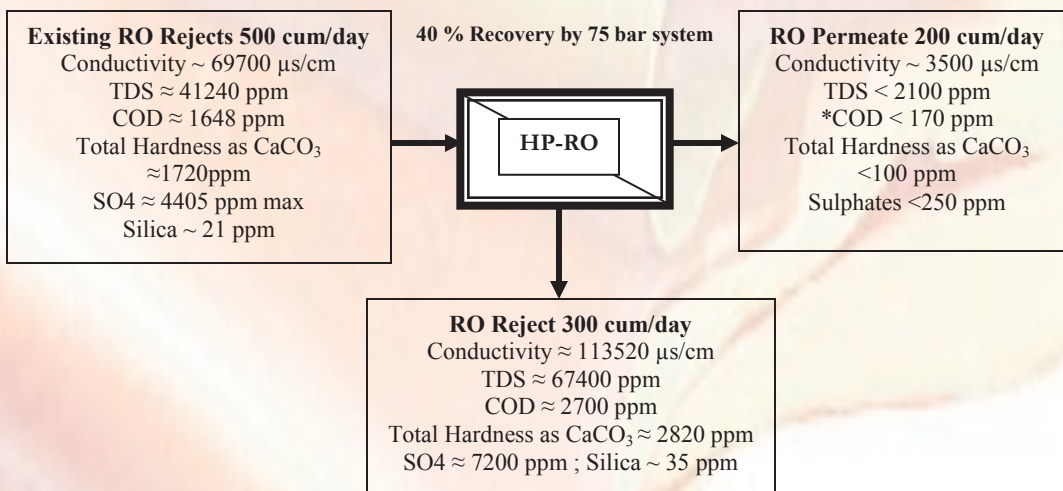
BENEFITS :

High Feed Conductivity to MEE ; Saving an Operating Cost and Energy ; Easier operation of MEE ; Conveniently achieving ZLD due to less Feed quantity

CHALLENGES :

TSS (<100 ppm) and Turbidity (<20NTU) in the Feed; Dissolved Gases; Excessive failures of Instrumentation and Switch Gears due to corrosive atmosphere.

Block Diagram of HP-RO Membrane Systems for Effluent Treatment/Recycle



The views and opinions expressed in this article are solely those of ROCHEM and do not necessarily represent those of ILIFO



XXXIV IULTCS CONGRESS 2017

Major Discussion Topics

- Fundamentals in leather science
- Strategies for sustainability
- Innovation and value addition for leather
- Advances in chemicals for smart and intelligent leathers
- Design innovation for lifestyle leather products
- Emission control technologies
- Enriching human capacity
- Global research alliances and partnerships

IMPORTANT DATES

Congress Dates

5 – 8 February 2017, preceded by India International Leather Fair, Chennai (1–3 February 2017)

Congress Localization Chennai

Abstract submission due

31 October 2016

Selection of papers

15 November 2016

Early bird registration till

November 2016

For more details :

<http://www.iultcs2017.org/>

Project Implementation and Monitoring Committee (PIMC) meeting

The PIMC meeting for ongoing Infrastructure Projects under ASIDE scheme was held on 21.7.2016 in Chennai. Dr. Emmanuel, Executive Director of ILIFO presented the progress of ongoing projects viz., Common Facility Centre (CFC) - Melvis-haram and Creation of Additional 596 KLD System in Madhavaram CETP.

ILIFO congratulates Dr. P. Shanmugam

Dr. P. Shanmugam, Sr Principal Scientist, Environmental Technology, CLRI, Chennai has been presented with "Dr. A. P. J. Abdul Kalam Award 2016 for contribution in the fields of Development of Science, Humanities and Welfare of Students" by the Hon'ble Chief Minister of Tamil Nadu on 15 August 2016.



Indian Leather units see opportunity in exports

The Indian leather industry is eyeing an opportunity to increase exports to the US and other countries, at a time when Chinese shipments to these markets are becoming more expensive. During the launch of the 19th International Technical Footwear Congress on February 3, 2016 organised in India for the first time in collaboration with the International Union of Shoe Industry Technicians and the Designers Fair for Leather Industry, the Council of Leather Exports said that while so far Indian exports were focusing in European countries, there is an opportunity in the US and other countries that are opening up to Indian exports. The Council is the nodal agency for the international promotion and overall development of the Indian leather and leather products industry.

said P R Aqeel Ahmed, regional chairman South, CLE. India is one of the largest footwear manufacturers, exporting around 10-15 per cent of the output. Almost 65 per cent of shipments are to Europe, while the US was not an impressive market so far. Currently around \$12 billion in size, the leather industry has been identified as a focus sector under the Make In India scheme of Government of India. Around 50 per cent of the leather business is in exports, while the rest is the domestic market. It envisages to increase the business to around \$27 billion by 2020, by when the domestic business would be around \$15 billion.

The Technical Footwear Congress discussed the latest developments in footwear manufacturing, under the theme Future Footwear Factory, with topics including intelligent manufacturing and digital smart factory, sustainable and regulatory trends impacting factories and attractive footwear factories and new way of management.

"Markets like the US has been mainly served by China so far, but with the cost of production going up in China, the products from that country are getting expensive and India has spotted an opportunity to export to these countries,"

Mega Leather Cluster to come up at Nellore, AP

The proposal for establishment of mega leather cluster at Kota Mandal, Nellore district, Andhra Pradesh has been approved by the Commerce Ministry with a central government assistance of Rs 125 crores. The project sanctioned under Indian Leather Development program would create state of the art infrastructure for labour intensive units and is expected to generate employment for 20,000 people and leverage an investment of at least Rs 500 crores in the first phase itself.

Waterless Chrome tanning

Chrome tanning in ethanol and its derivatives

Selvaraj Silambarasan, Aravindhan Rathina, Jonnalagadda Raghava Rao, Palanisamy Thanikaivelan, Central Leather Research Institute Chennai

Approach towards waterless tanning is crucial to address present challenges faced by humanity such as global warming and depletion of water resources. Here, green solvents alternate to water such as ethanol, ethyl acetate and ethyl lactate were employed for both pickle-based and pickle-less chrome tanning. Results show that ethanol medium appears to be the best solvent for chrome tanning in terms of color, chromium uptake and other bulk properties of tanned leathers. Extensive studies indicate that the chrome tanning in ethanol medium leads to higher better chromium content, distribution and

shrinkage temperature and low chromium leaching in tanned leathers compared to water mediated tanning. Both visual and electron microscopic analyses demonstrate comparable grain structure and fiber architecture in tanned and crust leathers. Similarly, strength and organoleptic properties of crust leathers are also comparable between ethanol and water mediated tanning. The process enables reduction of COD, BOD and TS loads in composite liquor by 14-26, 21-28 and 42-46%, respectively. The leather properties are not altered upon recycling of chromium containing ethanol liquor upto 2 times

These results suggest that it is possible to replace water by ethanol for chrome tanning, which offers great potential for sustainable leather manufacture with solvent recycling.

On June 5, 2016—World Environmental Day, Erode Tannery Owners' Association and CLRI organized the workshop on 'Roadmap on Sustainable Growth of Erode Leather Sector' and a MoU was signed to transfer pickle-free waterless chrome tanning technology in the tanneries of Erode. Kanpur leather sector has been identified as the second cluster to transfer this technology.

Energy auditing and conservation

Energy auditing provides a wide opportunity for tanneries to cut down the cost for electricity, fuel oil and firewood. The energy conservation has become one of the focus areas for tanneries which face perennial shortage of electric power.

The main energy consuming equipment in a tannery is the tunnel drier of autospray. The firewood energy is more expensive than electricity. Alternative sources of energy like solar air heating and IR lamps provide good scope for reducing the energy spent for drying in tunnel driers of autospray.

Electrical energy consumption can be optimized by several ways. Some of them are: bearings for drums, machine cut gears and pinions, gear box system in place of flat belts, use of capacitors at load end, arresting leaks of compressed air, water conservation, load optimization in process vessels, use of energy efficient motors and HVLP spray guns. The potential energy savings varies from 20% to 27% in a tannery according to past experience.

Felicitation of Shri M. Mohamed Hashim, Chairman, ILIFO

A Felicitation event was organized in Chennai on February 3, 2016 as a mark of respect to Shri Hashim, the elder statesman and Doyen of the leather industry. P. R. Aqeel Ahmed, Chairman, ILIFO gave the welcome address. Shri. Hashim was felicitated by more than 25 organizations. During his acceptance speech, Shri. Hashim said thanked the almighty, parents and elders in the industry. He expressed satisfaction over progress made on the environmental front. Shri Hashim mentioned his association with Shri Sahasranaman for 35 years.

Shri A. Sahasranaman, Patron, ILIFO listed few of his achievements :

- Transformation of leather industry from a supplier of raw materials to an exporter of value added products
- Uniting leather industry by the formation of CLE
- Ensuring growth of support industries
- Ensuring Eco-sustainable tanning operations through ETPs and CETPs
- Contribution to HRD under NLDP
- Establishment of IILP, CEMCOT, ILIFO, testing facilities etc.,

CATRAD TECHNOLOGY

An article by CATRAD Group



Catalytic Radical Generation Technology, with the use of certain catalysts and design optimizations, helps to achieve very high free radical concentration in waste water streams, enabling break down of very harsh effluents.

Catrad uses powerful and effective combination of purified air and catalyst to decompose unwanted chemical and organic compounds, COD, BOD and TSS. Unlike physical and biological treatment methods, Catrad system does not produce additional by-products and sludge, eliminating the need for further handling.

Catrad is a proven, more efficient and effective means of treating waste streams that meets and exceeds industry requirements.

CATRAD PROCESS DESCRIPTION

STEP1: Air Purification Generator: Purified air generated from atmospheric air by pressure swing adsorption principle.

STEP2: CATRAD System: Purified air is passed through CATRAD System with specialized proprietary catalyst.

STEP3: CATRAD with catalyst and power engineering is injected into the reaction tank with proprietary designed ventury for mass transfer.

STEP4: CATRAD reaction tank: CATRAD reaction tank is a state of art mass transfer and reaction tank to drastically breakdown the organics for COD, BOD, TSS, and other contaminant reductions from 95 to 99.99%.

WORKING

CATRAD consists of a set of purification generators generating purified air from the atmospheric air to the CATRAD System. The CATRAD Systems are custom built depending on the type of ef-

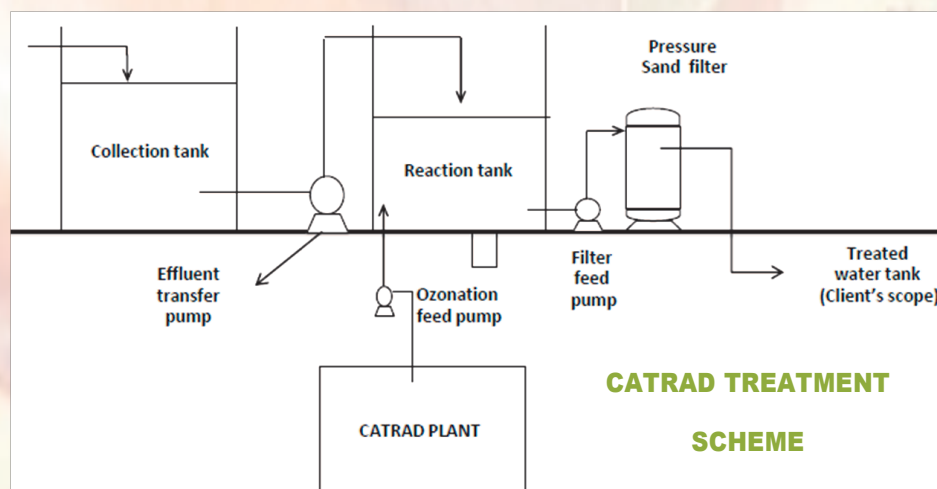
fluent, its retention time to break down COD, BOD, TSS, Color etc., which is based on the feasibility study and capacity to be treated. The CATRAD System consist of electrodes and catalyst with proprietary electronics to enhance its efficiency. The reaction tank has a recirculation system wherein the liquid to be treated is recirculated by mixing with the CATRAD. The reaction tank has an inlet and an outlet for the effluent to pass through wherein the reaction takes place and the required parameters are achieved without adding any chemicals and without generating any sludge. The reaction tank is designed based on feasibility study, and capacity to be treated. The treated water quality after a tertiary treatment is anywhere between 95 to 99.99%

BENEFITS OF CATRAD TECHNOLOGY

- More than 90% reduction of COD, Colour, TSS, BOD and other contaminations.
- Very Low footprint required compared to conventional system, hence saving our space and cost on civil works.
- Fully automated and hence only minimal man power requirement.
- No sludge generation.
- No maintenance of Biomass.
- Very Attractive Return on Investment.

Conclusion of CATRAD Pilot Trial at a CETP :-

Major reduction in SDI, This enhances the life of the RO membrane substantially, Apart from this there is a reduction in Color, COD, Turbidity Etc., Liquid Oxygen –55 Ltrs/ Hour and Ozonator capacity –15 Kgs/ Hour



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The ILDP scheme, with an approved outlay of 990 crore, during the 12th plan period is under implementation and has the following 6 sub schemes– Integrated development of Leather Sector, Human Resource Development, Mega Leather Cluster Scheme, Support to Artisan Scheme, Leather technology, Innovation & Environmental Issues, Establishment of Institutional Facilities.



Monthly Core Committee Meetings

The purpose of the committee is to exchange experiences on a regular basis and also to discuss on ways of producing the cost of operation of ZLD system. Every month, second Thursday has been notified as the meeting day. So far the committee had met 13 times and the minutes of the meeting were communicated to the CETP. The CETPs were being requested to send their issues as agenda in advance. For a meaningful analysis and recommendation on the cost factor, a format was prescribed and the CETPs were asked to send the filled-in formats. This is to compare with the other CETPs and whenever the cost in a particular process is abnormal, to suggest ways and strategies to reduce the same via a good practice or technology. This meeting also witnesses good interaction and results on other subjects in the agenda like the installation and monitoring of pilot units, evaluation of the impacts on overall performance and O&M, comparison of different technologies to arrive at optimum solution etc.,

Current activities of ILIFO

Currently, ILIFO has been working on the following areas: ·

- PMC for the CFC and CETP upgradation in IGC Lassipora, J&K.
- PMC for the CFC VISHTAN in Melvisharam.
- Additional 596 KLD project in Madhavarm.
- ETP up gradation in KHEIPL, Ranipet.
- Retainer consultancy for Florence shoe company, Ambur.





INDIAN LEATHER INDUSTRY FOUNDATION

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