



Need for process change

- **Value engineering option – Productivity & Cost**
- **Pollution avoidance / Enhance viability of end of pipe treatment**

**Salt-free Zero Emission Chrome Tanning
Technology ensures both**

Conventional Chrome Tanning : An assessment

Unique resistance to degradation and thermo mechanical stress

- >85 % global leather production through chrome tanning
- 1.6 billion Sq.ft of leather in India treated with chromium
- 7-8% BCS employed in tanning
- Exhaustion levels of 60% of Chromium is common



Pickling : An assessment

To ensure uniform distribution of chromium during subsequent tanning

- 8 - 10% salt employed in pickling
- Discharge levels of 80,000-100,000 ppm of chlorides not uncommon



Earlier attempts

- **Use of new auxiliaries** : Change in leather characteristics & Restrictions
- **Pickle recycle** : Quality consistency, Handling difficulties and carry over of >30% salt
- **Direct chrome liquor recycling** : Handling and operational difficulties and carry over of salt

Earlier attempts

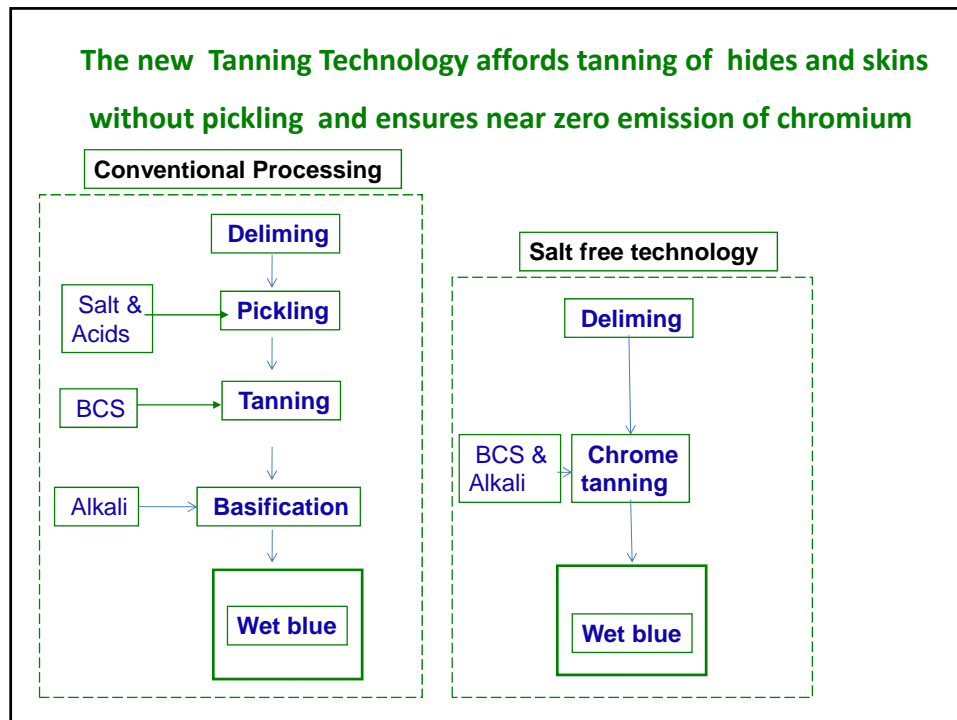
- **Pickle – tan closed loop** : Change in leather characteristics, Salt and TDS carry over ; Limited recycles
- **High exhaust chromium process and products** : Pickling issues not addressed, Inadequate for direct discharge

Earlier attempts

- **Chromium recovery and reuse** : Pickling issues not addressed, Increase in neutral salts discharge, Greater process control need

Needed Solutions in Tanning

- **Complete elimination of Sodium Chloride**
- **Tanning efficiency exceeding 90% and near zero emission of chromium**



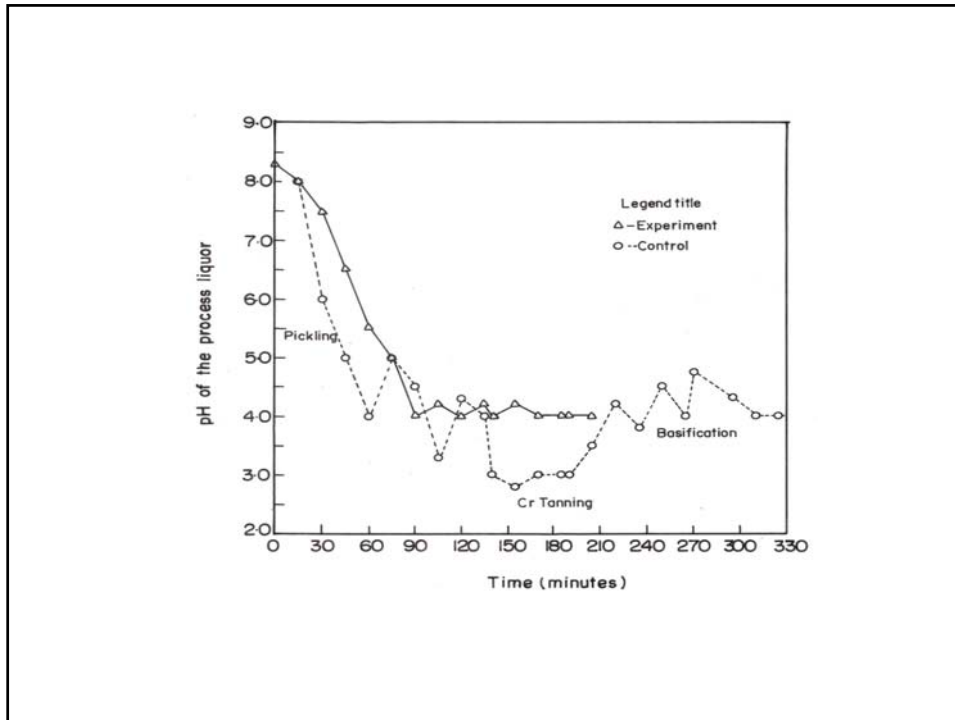
Approach

- ✦ **Tanning at high pH with masking :
enhancement of alkali stability
(Choice, Combination, Quantity of masking
agents - Critical)**

- ✦ **Regulated hydrolysis of tanning salt &
in-situ neutralisation of acidity**

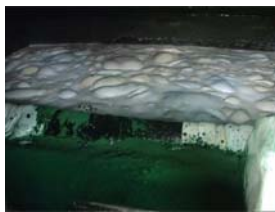
Outcome:

**Elimination of pickling and chlorides ,
reduction in TDS , high reactivity**



Economics of Salt free technology

(for 100 ton of hide/skin)



⬇️ **Cost saving in chemical input
Rs. 120000**

⬇️ **Savings in Cost of treating salt :
Rs. 80000**

Net saving : Rs. 200000

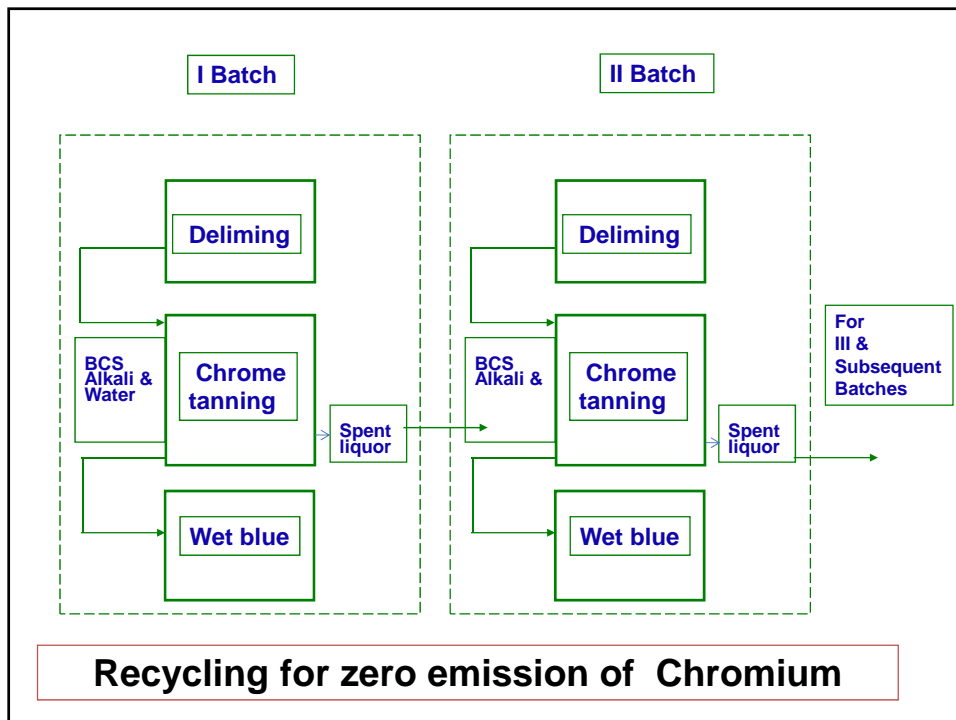
Indian capacity : 2300 Tons / day



SPENT PICKLE TAN LIQUOR ANALYSIS

Process	TDS (ppm)	Chromium Cr ₂ O ₃ (ppm)	Chlorides (ppm)
CST	8090±10	250±10	Nil*
Conventional	98830±10	2800±10	54400±10

*Traces carried over from preservation



ANALYSIS OF WET BLUE LEATHERS

Layers in leather	%Cr ₂ O ₃ Content	
	CSZT	Regular
Grain	4.3	3.5
Middle	4.1	3.0
Flesh	4.5	4.2
Average	4.3	3.6

CSZT Technology : An assessment

- Elimination of pickling & basification in chrome tanning
- The technology uses only conventional tanning chemicals and does not call for use of any additional chemical
- Suitable for all substrates and types of leathers
- Significant reduction in process duration

CSZT Technology : An assessment

- **Minimizes Total Dissolved Solids in effluent**
- **Leads to chromium exhaustion exceeding 90% in tanning**
- **The process ensures minimization of chromium discharges in post tanning operations**
- **The technology ensures near zero emission chrome tanning**

- **No long lasting environmental solutions **feasible without process modifications** in leather making**
- **Process innovations - Key for the **growth and sustenance** of the tanning industry**

THANK YOU