

Hair save unhairing-liming

Introduction

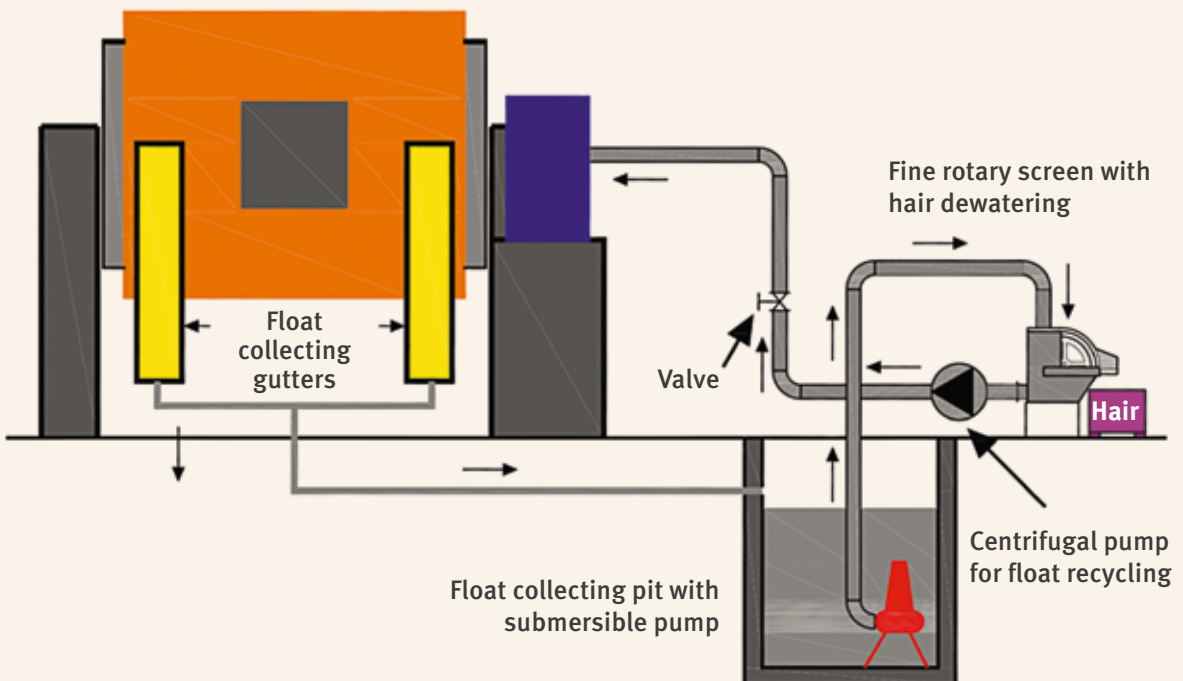
Liming is a process employed in tanneries to remove the hair from raw hides and skins using drums or paddles. It is usually carried out using hydrated lime – $\text{Ca}(\text{OH})_2$ and sodium sulphide – Na_2S . In addition to consuming large amounts of water, liming with hair-burning is one of the most polluting part of the entire leather manufacturing process in terms of nearly all the key parameters such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids, total dissolved solids (TDS) or salinity and nitrogen.

Although some forms of hair-save unhairing have been used since time immemorial, they have been compromised with the advent of rapid tanning methods. Fast, modern, commercial methods were only developed during the 1980s/1990s with the advent of the requisite equipment (mixers or drums are fitted to recirculate the liming liquor used during the process and to separate the loosened hair). This results in significantly less environmental pollution. The benefits of using the hair-save method nowadays are further outlined on page 2.

Process description

The principle of the hair-save unhairing method is as follows: firstly, the hair fibre is partially immunized by an alkali (lime); secondly, the hair

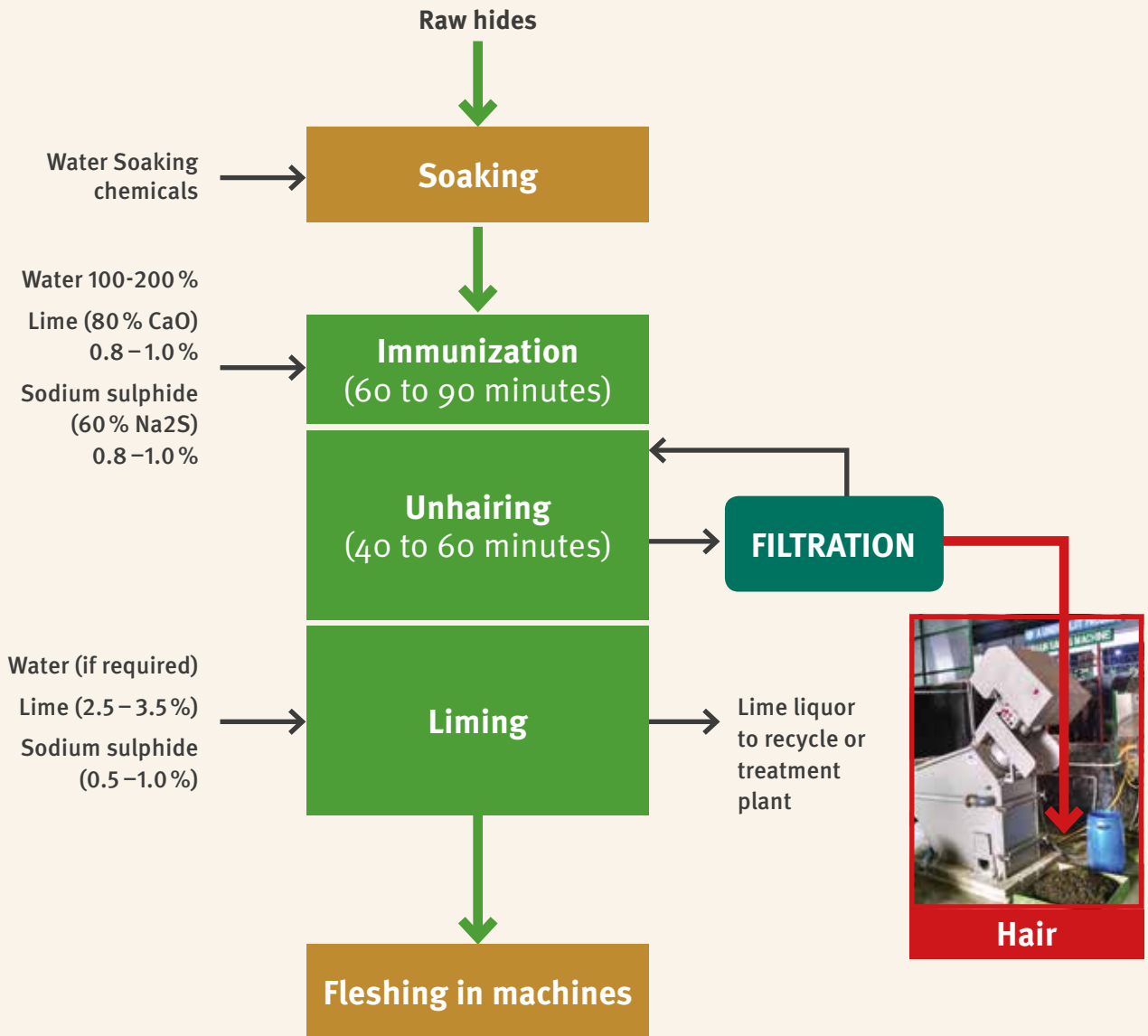
fibre is removed using sulphide; and finally, the hair is recovered from the process liquor through filtration.



It is necessary to separate the liming liquor from the drum. The most efficient way to achieve this is by using drain valves fitted to the drums with a bath separation compartment inside the drum.

The liquor is collected by bath collection channels and is either sent to the transfer pit or directly to the filtering machine. The liquor from the filtering machine is sent back to drum.

PROCESS FLOW DIAGRAM FOR HAIR SAVE UNHAIRING



The quantity of hair recovered from Indian origin buffalo hides is about 1 to 2 percent of the weight of raw hides, depending on the amount of hair

present in the material. The recovered hair is used as compost.

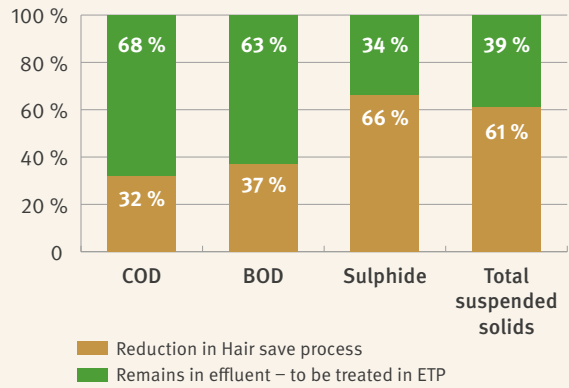
Benefits

The benefits of saving hair are as follows:

- significant decrease in the organic pollution load (SS, COD, BOD and sulphides);
- significantly lower volume of sludge for reuse or disposal; and
- lower costs of effluent treatment (fewer chemicals and less energy).

The chart below indicates the cost benefits of installing a hair save unhairing system for a tannery of processing capacity of about 5 tonnes per day.

Reduction of pollution load in liming wastewater while adopting hair save unhairing



Investment cost Rs. 1,320,000

Annual savings
(after excluding operation and maintenance expenses) Rs. 303,360

Payback period 4 years approximately





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THIS PILOT DEMONSTRATION UNIT HAS BEEN IMPLEMENTED BY
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