**4.3.3.1 Reuse of treated waste water in soaking and liming processes**

**Description**

Treatment and storage of waste water for use in the early stages of processing.

**Technical description**

For reuse, the water from tanning and dyeing is treated in a sedimentator and utilised for soaking in the liming drum and as rinse water after liming.

The acidic waste water from tanning, retanning, dyeing and fatliquoring is treated mechanically and is subsequently alkalised and sedimented with the addition of polyelectrolytes and metal salts. The water thus treated is used in soaking. The rinse water from before deliming is reused for the first rinse stage after liming.

The second rinse water after liming is stored, sedimented and temperature-controlled in a tank and is used the next day as the first rinse.

Due to high organic and sulphide loading, the first rinse has to be treated and cannot be reused in the process.

**Achieved environmental benefits**

A saving of approximately 20 % of total water consumption can be achieved by applying this water recirculation technique.

**Environmental performance and operational data**

Through this measure the reference company was able to reduce freshwater consumption in soaking and liming by 60 %.

Comparative operational data before and after introduction of the measure are shown in Table 4.4 (values refer to the overall process).

**Table 4.4: Operational data for reuse of treated water in soaking and liming.**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Without water recirculation** | **With water recirculation** |
| Waste water | 12 m3 per tonne of raw hide | 9.5 m3 per tonne of raw hide |
| Energy | 6.3 GJ per tonne of raw hide | 6.3 GJ per tonne of raw hide |
| Chemicals | 450 kg per tonne of raw hide | 450 kg per tonne of raw hide |

*Source:* [114, Germany 2010].

**Cross-media effects**

A build-up of the salt content, an increase in temperature, and problems arising during biological treatment of the effluent.

**Technical considerations relevant to applicability**

Can be used in both new and existing installations. The reference company with 90 employees produces high-quality upper leather for shoes in a full-stage process extending from soaking to finishing. The introduction of this measure at the company led to no loss in quality.

**Economics**

Investment costs: EUR 298 000. Cost savings: approx. EUR 40 000 per year. The measure was supported with a EUR 100 000 subsidy under the funding programme 'Ecological and sustainable water resources management initiative of North Rhine-Westphalia'.

**Driving force for implementation**

Reducing water consumption for economic and environmental purposes.

**Example plant**

Josef Heinen GmbH & Co. Kg, Wegberg.

**Reference literature**

[114, Germany 2010] [115, U and Nat Nordrhein Westfalen 2008].