

**EVOLUTION OF LEATHER INDUSTRY,
REDUCTION TO MINIMUM OF
CONTAMINATION, SYSTEMS FOR
DEPURATION, SAVING AND RECYCLING
WATER**

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The leather industry is considered in all the World as a contaminant and dirty industry.

- *Today, this qualification is not right. In a lot of countries, using the clean technologies there is a big change in our sector, and, in a time of recovering and recycling well considered in all the world, I believe that we arrived to the point to remark the dignity of our work, and between everyone change that all image and obtain the recognition of our efforts.*

The TARGET of any Leather Industry with long term objectives must to be:

- ***OBTAIN PRODUCTS OF THE BEST QUALITY, AT A REASONABLE COST, PRODUCING AS LESS CONTAMINATION AS POSSIBLE, WITH THE MINIMUM CONSUMPTION OF WATER AND RECOVERING AND RECYCLING ALL THE POSSIBLE***

Thinking about Pollution:

There are three kinds of contamination coming from the leather and the process of achieving it:

- ***AVOIDABLE:*** *Part of the excessive salt, organic residuals, sand, part of the fats.*
- ***UNAVOIDABLE:*** *Is coming from the leather material, hair, liquid keratine, rests of meat and leather, liquid proteins,...* Suppose the 60% of COD and is organic and with biodegradability.
ADDED: Products not well fixed during tanning, in part we can avoid it

According with the anterior explain, the tanner must:

- *Try to obtain the leathers with the minimum of avoidable contamination, first step of a good environmental management.*
- *Use clean technologies that reduce the unavoidable contamination.*
- *Select the right products and develops the right processes for to generate the minimum added contamination.*

Main Pollution agents characteristic of the waste tannery waters:

- *Salts and conductivity produced by them.*
- *Soluble organic material, coming from the hides, from tannin agents or dyes. Is the basis of the COD and BOD, could be reduced in 95% with a good biological depuration.*
- *Sulfides. Can be cleaned by air oxidation.*
- *Ammonia nitrogen or total. We can eliminate in the biological process by the reactions of nitrification and denitrification. Chrome 3. Coming from the tanning agents not properly fixed or returned to dissolve, we can eliminate by fall.*

USE OF CLEAN TECHNOLOGIES:

Reduction of salts contamination:

Alternatives by cleanest order:

- *Cold conservation. Is needed the daily collect with fridge trucks.*
- *Salting with dissolved salts: Better with a previous removal of the flesh, liquid salting in bath during 18 hours with a low removal type Holland bath, the leathers absorb around 20% of the weight in salt.*
- *Classical Salting : we need around 7 days for obtain a good result, a 20% of salt is lost by filtration.*

Reduction of pollution in the wet processes:

- *The high temperatures make a degradation of the leather and increase the COD in all the effluents of the process.*
- *Reduction of MES and COD. Peeling recovering the hair. This process allow us to reduce around 40-50% MES and COD, at the same time we are reducing the sulfide contained in the waste water.*
- *Reduction of Nitrogen. Making a partial substitution of the ammonal salts. Peeling recovering the hair. Doing nitrification and de-nitrification reactions in the biological depuration.*

Reduction of contamination recovering baths of Chrome III.

- *The Chrome III at pH 7 is chemically an stable hydroxide, Is not cancelling the process of biological depuration but is reducing the results. Is conditioning the final destination of the mires due that the maximum allowed for agricultural uses is of 1.500 ppm on dry weight.*
- *Uses of 6,5 – 7 % of solid chrome salts are enough for a proper tanning if we are controlling well all the conditions.*
- *The excess of Chrome could be separate by fall.*

Reduction of contamination produced by added products:

For to obtain the minimum contamination the tanner must:

- *Purchase chemical products concentrates, preferably in liquid.*
- *Select high fixation ones.*
- *Control the process conditions for to obtain the better fixation. pH, temperature, time and mechanical effect conditions.*
- *Control of characteristics of not fixed products in front of biological reactor and final destination.*

Water saving:

Usually the water saving is a consequence of the clean technologies.

- *Any system of get off solid materials help us to reduce the volume of water to use.*
- *The discontinues washes help us the save water and we win regularity*
- *The pressing machines for washing floor and machinery will also save water.*

Waste water depuration in Leather Industry

- *The contamination in tannery water is almost organic and biodegradable, coming from solved protein and organic products not properly fixed in the process. The conjunction of all the process waters at levels of concentration coming from clean technologies, allow the live and the work of the bacteria and a good biological depuration.*
- *Is essential a previous de-sulfide process and a homogenization of 48 hours for obtain uniformity.*

Waste water depuration in Leather Industry

- *From all the contaminants, only the salts remain unaltered after the proposed procedures. The concentration levels of chloride are between 3.000 y 6.000 mg./liter and the sulfate ones between 1.000 y 2.000 mg./ liter. **The destination of the used waters will determinate the parameters, sometimes the only solution is to make the global treatment with urban waters or coming from other industries with biological, this dilution could help us to obtain the required levels.***

Basical conditions for a good depuration of waste water from leather Industry:

- *Is convenient to dispose of a homogenization tank with air contribution during 48 hours making a regularized charge and flow.*
- *If we have variations of conductivity higher 15.000 micro Siemens can produce reductions of performance.*
- *We recommend to make a supply of additional air to liming water before to pass to homogenization bath.*
- *The biological treatment must be retained during 2-3 days for reduce the size of the bigger organic molecules that produces color in the water.*

Basical conditions for a good depuration of waste water from leather Industry:

- *Is important that the level of the water in the biological tanks would be on 6 meter for to have a good transference of oxygen in the air.*
- *In the primary decanting of a well homogenized water, we can make the elimination of a 75% of suspended solids and 35-40% of COD.*
- *With centrifugal or press filter with right polyelectrolytes, the reject can arrive to 28-29 % dry.*

Uses of the sludge produced in Leather Industry:

- *These ones usually have 60-70 % Organic materials on dry weight, 3-5% of Nitrogen but a low contain of Potassium.*
- *If we did a proper reduction of Chrome, we can use for agricultural uses making an adaptation to the specific cultivation.*
- *When we use for situational agriculture, then, must to be stabilized waiting for the use, making by composting or thermal drying.*

Recycling water in Leather Industry:

Recycling refined water.

- *We can do in sheepskin process, where the consumption by skin is around 150-200 liters per unit. The idea is recycling levels of 40 %.*
- *Also is interesting for washing baths during all the process, even in cow leathers.*
- *The reduction of water volume used is not necessary a reduction of contamination because each kg of leather produced a determined quantity of contamination, the factor changing is the concentration in water.*

Resume of the clean technologies use in Leather Industry:

- *Selecting the raw material, purchasing concentrated products, taking the clean technologies explained, doing little process variations, taking special attention to bath exhaustion, taking measures for increase the fixation in all the process.*
- *Is possible to reduce the contamination of the waste water in more than 50% compared with traditional process and save around 30-40 % of water.*

Resume of the clean technologies use in Leather Industry:

- *The investment cost will be recovered fast due to the saving in products and environmental costs, at the same time we are increasing our quality and regularity.*
- *Reduce the contamination is not difficult, is a question of interest, imagination and enough recoverable investment.*
- *The satisfaction of to reduce the contamination and help to change the image of our industry compensate all the efforts.*

THANKS FOR YOUR ATENCIÓN

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