



Sheepskins, such as those being sorted here, are often transported after pickling. This means some salt has already been used. CREDIT: HENAN PROSPER

Reduction of salt usage in leather processing

The issue of salt usage is one which the leather industry is still fighting to address. World Leather technical editor Mike Tomkin delves deeper into why it poses such a big problem and calls on the industry to do more to tackle it head-on.

It may come as a surprise to those not directly involved in the manufacture of leather that a product we regularly use to flavour our food, salt (or sodium chloride), causes huge problems for those treating tannery effluent. Its usage needs to be significantly reduced. The most significant use of salt is as a temporary preserving agent for raw hides and skins in a process known as the curing. A secondary use is in the pickling stage of the leather process, immediately prior to the tanning. The large volumes of salt used, coupled with the difficulty of removing a highly soluble product from the wastewater, is the main problem, rather than the toxicity of the product itself. There are of course limits to the safe handling of any chemical.

When hides and skins are removed from the animal carcass in the slaughterhouse, they will quickly begin to decay unless the leather processing starts immediately or they are temporarily preserved. The most common method for doing this is to spread salts across the hide or skin to prevent bacterial action. Provided the hides are then stored in a cool, dry environment, no decay will occur. This means it is safe to store them in their original location, or to transport them to the intended processing site. Freezing is an

alternative method of preservation but comes at a much higher cost considering the large volumes of material involved and the need to keep the hides frozen during transportation and at the processing site before work begins.

Research has been done on brine curing, the wet application of salt, but this does not decrease the overall salt usage. It also increases the weight for transportation, so it is an impractical solution. The use of biocides for raw hide preservation would lead to toxicity issues given the volume of products that would be needed, so again this is not a practical alternative.

When salted hides arrive at a tannery, the first process is normally to wash off the salt by rinsing with water. The rinsing solutions go directly to the tannery effluent system and the treatment problems begin. Some tanneries use a dry-tumbling action prior to rinsing; this prevents much of the salt from entering the effluent stream as it can be collected in solid form. This salt is contaminated, however, and cannot be reused in the curing of more hides. It becomes a solid rather than a liquid waste problem. The liquid waste problem is a major issue in areas with a high concentration of tanners. This is because there is little chance to dilute the tannery



waste with the waste of other industries which do not use salt in their processing. In countries such as India, it is the single biggest issue facing the leather industry.

Collaborative action

Without a practical alternative for salt as a curing agent, the hide suppliers and tanners have had to work together to avoid the initial salting by part-processing the hides at or close to the slaughterhouse, at least to the stage where much of the waste has been removed and the hides or skins can be safely stored and transported. At this stage, there is enough processing still to be done so as to allow the receiving tannery to make the leather of its choice. For most, this means receiving leather already tanned to the wet blue or wet white stage. One notable exception to this would be wool sheepskins which are generally sold and transported at the pickled stage.

There is no need for the tanners receiving these hides to use salt in the subsequent processing and there is little or no salt already in the hides, so their effluent problem is reduced. Processors, working from raw through to the tannage, start with fresh hides, so there is no salt usage for preservation. Some salt is used in the pickling stage prior to the tannage, however.

There are some alternative tanning methods for wet white which avoid the need for pickling, and there is work being done on pickle-free chrome tannage, so it may be possible to eliminate salt usage at this stage as well. The reason wool sheepskins are transported in the pickled stage is partially historic but it also allows the receiving tanner more flexibility in their process and gives them control over the critical degreasing stage of the process. This has to be carried out prior to tannage to prevent fixation of the grease. It does mean, however, that the receiving tannery must deal with the salt contained in the pickled skins. Over the last few years, sheepskin tanners have been working with their skin and chemical suppliers to find a practical way forward which would enable them to receive tanned rather than pickled skins while still being able to make their own individual leathers.

Wake-up call

The processing of hides close to source rather than transporting cured hides can significantly reduce the amount

The problem of liquid waste is especially prevalent in areas with a high-concentration of tanneries, such as several clusters in India, where it is not diluted by waste from other industries. CREDIT: KING'S INTERNATIONAL

of salt used. This in turn reduces the impact on the effluent stream. It is not the only benefit of this process change, however. Depending on the type of leather being produced, it is rare that more than 30% of the original hide by weight ends up in the final leather, which means over 70% is going to waste at some stage of the process.

Much of this waste is of low value, which means transporting it to an appropriate site for reprocessing into something useful. This is not a feasible option financially, so it ends up in landfill. Part-processing of hides at a limited number of sites near to their origin rather than at thousands of tanneries around the world would allow waste materials to be dealt with more efficiently. Local processing is also a viable option because it reduces the cost of transportation. Why transport a material for which less than 70% will end up in the final product when it is possible to receive a material which results in far less waste?

It has been shown that there are a number of ways to significantly reduce salt usage and so also the subsequent wastewater issues. This leads to the obvious question of why the leather industry has not made more progress in addressing these problems. While some leading tanneries have made progress, others have chosen to sit back and wait until they are forced to act by government legislation, environmental pressure or customer and consumer demand. Those tanners need to wake up to the fact that we live in a changing world.

Take the plastic industry as an example. It has consistently ignored the damage being done to the world's oceans by its products; they can no longer do so. There is growing urgency to replace plastic with more environmentally-responsible materials.

The leather industry also comes in for criticism, some genuine, but plenty that is unfair or untrue. What is certain is that a lack of response and corrective action will damage the image of the whole industry. We have known for a long time that we need to reduce the amount of salt we use. We know how to do it, so let's get on with it. ☺