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Issue 60 | July/August 2023

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THE GLUTARALDEHYDE HEADACHE



Sustainable tanning with olive mill wastewater

Italy-based leather chemicals maker GSC Group discusses its latest product innovation – Olive Mill Wastewater (OMW) tanning technology and answers some specific questions around the properties of the leather made with OMW.

GSC Group is exploring a new frontier of biobased tanning. The latest leather chemical innovation launched by the Montebello Vicentino headquartered company, which has been producing chemical solutions for leather processing since 1976. The new product combines science from both the tanning industry and the olive oil food industry. This has resulted in Olive Mill Wastewater (OMW) technology, a line of products which exploits the tanning power of olive oil vegetation water, a waste by-product from the pressing of olives and the subsequent centrifugation of the aqueous squeezing emulsion. OMW combines two important national industrial sectors. Italy is, in fact, among the world's leading producers of leather goods, a supply chain which produced 97 million sq m of finished leather in 2020-21. And it is also the second largest producer of olive oil in the world, with 315,000 tons a year. The project was born as a national supply chain, given that these tanning auxiliaries are produced





through an exclusive process that uses OMW from mainly Tuscan and Apulian olive oil companies.

Heavy metal free

The olive mill wastewater, in fact, although free from pathogens, heavy metals and viruses, is harmful to the environment due to the high levels of acidity and anti-microbial and phytotoxic power. Basically, it is not very biodegradable and the volumes are quite substantial. According to data from ENEA - EAI (Italian National Agency for New Technologies, Energy and Sustainable Development), tens of millions of tons of OMW are produced every year in the Mediterranean basin. In Italy, there are about four million, of which two are produced in the Puglia region of Italy.

OMW tanning agents are obtained from waste from the food industry and applied to waste from meat production (ie hides and skins). In this way, it is also possible to potentially reduce greenhouse gas emissions and therefore the environmental impact of manufacturing processes. Processing with OMW is free from the risk of formation of hexavalent chromium and is also free from the toxicity of glutaraldehyde, says GSC. OMW tanning, which is protected by an international patent, is eco-sustainable and metal-free and suitable for leathers used in all types of applications and segments: automotive, footwear, leather goods and upholstery. It allows for leather with high-level characteristics and performances comparable to traditional tanning and is therefore a great alternative without compromises in terms of quality, performance or appearance.

What is the shrinkage temperature of OMW-tanned leather?

The shrinkage temperature of tanned leather using OMW technology is between 70-75°C according to UNI EN ISO 3380.

How do the physical properties compare with chrome-tanned leather?

The leather obtained via OMW process shows equal properties compared with traditional chromium-tanned leather. Physical tests respond to GSC's stringent requirements, and the leather has moderate-to-high light and heat fastness and tear strength.

What about tear, elongation, maeser/bally, water permeability, flex and fogging test results?

The results of these tests for OMW-tanned leathers are comparable to the to those of normal wet-white leather.

What colour is the undyed crust and can it be used to make white or pastel shades?

The tanned OMW leather has a beige-ivory colour. It can definitely be used to make pastel shades but it is more difficult to get a pure white shade.

What finished product applications can it be used for?

Initially, GSC Group developed the automotive application, although the company's technical department is implementing the application of the OMW for the entire market. Leather makers in the automotive industry first prompted requests for a new tanning technology (such as OMW), aiming at the reduction of environmental impacts and the implementation of more sustainable processes and the utilisation of chemicals obtained from circular processes. However, at present, all leather end-user segments as well as automotive are moving towards this kind of new technology.

Can it be used to make biodegradable leather?

Biodegradation is a biological process carried out by a selection of specific microorganisms; different methods are available and they do not always converge to the same results. Leather is a natural product and it is a biodegradable material; the fact is that all chemicals used in leather manufacture influence and compromise its biodegradability, including OMW. Therefore, because OMW is made from natural chemicals should not lead to the conclusion of a more-biodegradable leather, it always depends on the process methodology used in the tannery and on the final leather product.

GSC Group tested the biodegradation of OMW, glutaraldehyde and chromium-tanned leather according to UNI EN ISO 20136 and found that OMW shows the highest biodegradation (93%), followed by glutaraldehyde (85%) and chromium-tanned leather (80%). Therefore, according to this ISO methodology, OMW should be considered as the best choice to make a biodegradable leather.

How do the leathers handle and organoleptic properties compare with chrome or other vegetable-tanned leathers?

These characteristics are strongly influenced by the subsequent retannage and fatliquoring. The handle is similar to that of wet-white leather and, odour-wise, the OMW-tanned leather is neutral. |