



Preservation and sustainable leather management

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Responsibility beyond supplying chemicals

Sustainable Leather Management (SLM) is the new paradigm and key driver for all activities of the Leather business unit including preservation technologies. The term “sustainability” is clearly defined and some aspects can be measured and put into numbers. One example is the product carbon footprint (PCF) which becomes more and more present in daily life. Modern consumer research has recognised that a change towards a truly sustainable economy is immanent for safeguarding our living conditions both now and in the future. For the production of consumer products such as leather this means that basic renewable resources must not be consumed faster than the rate at which they can be generated. Pollution and waste must not be emitted faster than natural systems can absorb them.

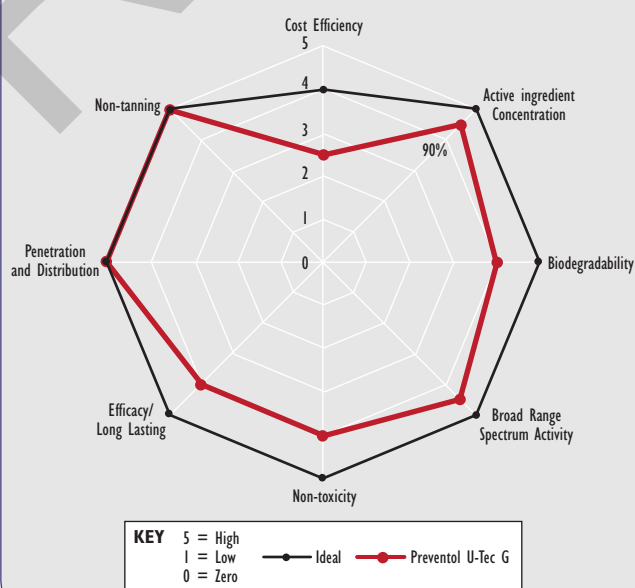
The effects of low level microbic infestations

One of the biggest concerns in the leather industry today is the frightening lack of attention given by some tanneries to microbes and the loss in profit they cause. Take, for example, our own bodies. It can be difficult to comprehend the fact that there are ten times more cells of microbes inside and on our bodies than there are human cells!

Microbes are everywhere: in the air, water, soil, in and on plants and animals. They cannot be avoided, so professional steps have to be taken to manage them together with a competent partner. Failure to do so results in costly, if not catastrophic, claims sooner or later.

When microbial growth is visible on the surface of leather it is at an extremely advanced stage. Long before this stage is reached, lower level infestations are virtually invisible but their effects serious, resulting in loose grain, reduced physical test performance, “veininess”, unpleasant odours and other downgrading problems. Due to microbes “invisibility” at these early stages, the situation is made worse and more costly when the tanner unwittingly attributes the problem to the wrong cause. Worse still, the microbes remain in the leather untreated.

Panel 1: Ideal preserving agent profile and Preventol U-Tec G



Eutectic technology

To protect leather against microbial attack, Lanxess is launching a new series of preserving agents based on eutectic technology. This technology enables us to convert two or more products which are normally solid at room temperature to a single, stable and ultra-concentrated liquid. Conventional products are usually prepared in water in emulsion or dispersion form.

This new approach provides many advantages. It enables us to avoid additives that can be found in some conventional water or solvent based products - such as emulsifiers, stabilisers, antioxidants, salts, and increasingly precious water. Organic



solvents in preservation chemicals may not only contribute to VOC emissions but also increase the risk of human skin absorption. Our aim is to reduce emissions from products and so this product is state-of-the-art in this respect.

The new preservative has already been released for global sales, and provides several advantages that save both energy and costs. It contains absolutely zero water so no valuable drinking quality water is contaminated for industrial product use. Rules exist for not using certain food grade materials in industrial chemical products and it could be merely a matter of time before such rules apply to water. Here Lanxess takes a proactive approach. Packaging and its disposal, and effluent volumes are greatly reduced compared to conventional products. Carbon dioxide / transport emissions will also be less through the substantially smaller product volume.

Natures defence mechanisms

Preventol® U-Tec G benefits from our extensive know-how in tailor-made aromatic alcohols, and as such it acts similarly to natural components like Thymol or Carvacrol. These are used by plants such as Origanum or Ajwain to defend themselves against microbes. These fungicides produced by nature prevent microbes from absorbing nutrients, and similarly this preservative possesses a unique bio-mimetic profile. Together with its extraordinarily low toxicity, this explains why it is in such high demand currently. Furthermore, the unique regenerative action of this chemistry - after destroying one microbe it is released to go on destroying many other microorganisms again and again - means that the product has very high efficacy and efficiency at a leather typical pH of 4. At the same time it is easily biodegradable at a pH of 7, which

prevails in waste treatment or the broader environment. Members of this class of active ingredients therefore have one of the highest, if not the highest, sustainability profile in this product group. This makes them eligible for the status of US EPA Minimum Risk Pesticide or even suitable for the preservation of cosmetics.

Moreover, this preservative does not have a tanning effect, which means it is not "consumed" by the leather. The maximum amount of active substance is available to do its job, that is destroying microbes. Only the absolute minimum of dosing is necessary, thus again contributing to its sustainable profile. In addition, it does not react with common nucleophilic process chemicals such as basifiers (MgO), ammonium salts, sulfites etc., thus optimising the sustainability profile.

Preventol® U-Tec G has the broadest spectrum of activity of any commercial product that we are currently aware of. This means it can save time, money and the natural resource leather. By avoiding the need to apply multiple products from different sources, logistical and emission savings are possible. The special chemical structure of this product gives a high penetration and distribution behaviour so that all the collagen fibres are well protected, not just the surface. The molecules remain in position waiting to tackle microbes throughout the leather substance. Considering all the requirements of an ideal preserving agent, this comes close to the profile, and this is expressed as Panel 1.

This preservative has proven successful on both chrome and vegetable tanned leathers, and wet white production. Its profile is also compatible with the continuous and growing push for more efficient processing, recycling and reduced emissions from the end products in the leather industry. This is fully in line with the new initiative of SLM management. ☺

Panel 2: Objective: Sustainable Leather Management

Dr. Dietrich Tegtmeier

Sustainable development is a key issue for the future of industry and society. It is also one of the prime corporate objectives of the Lanxess specialty chemicals group. This is reflected in the new holistic initiative "Sustainable Leather Management" that has now been launched by the company's Leather business unit to build a technology platform for sustainable solutions.

Leather is a natural product that has been known and valued since ancient times. Over the ages, the demands made on leather have continually increased. This is not just with regard to its properties and production efficiency, but now particularly with regard to industrial safety, environmental and consumer protection and sustainability.

Sustainability is more than just a fashion trend. It is vital if sufficient quantities of high-quality leather are to continue to be available at affordable prices in the future without damaging the environment or public health. Sustainability in the leather sector means more efficient production, processing and recycling. It is a commitment to handling both the raw material and the waste produced even more responsibly and to reducing emissions from the end products.

The basic principle of sustainability is that renewable raw materials must not be used up more quickly than they can be produced. There is, for example, no way we could maintain current leather production levels using vegetable tanning materials, so for this reason most leather is produced using synthetic tanning and retanning materials. Likewise, the industry must not produce more waste and emissions than can be degraded by the environment within the same period of time.

The aim is to develop and market a range of premium products and system solutions that are specially tailored to sustainable leather production. Objectives in this area include:

PRODUCTS:

- (1) optimised retanning materials that contain little or no salt and no free formaldehyde or phenol. Renewable raw materials are to be used wherever possible.
- (2) a new tanning system based on toxicologically sound organic chemicals for sustainable wet white production, which is on par with the best chrome tanning procedures.

PRODUCTION PROCESSES:

A sustainable production process for leather with minimal wastewater impact (COD – chemical oxygen demand). To this end, special recipes are being developed on the basis of, for example, efficient beamhouse work or chrome tanning with maximum exhaustion.

LEATHER GOODS:

Processes designed to reduce the weight of leather and increase its service life and a leather recycling process.

The Sustainable Leather Management program sets down a benchmark for sustainable, eco-compatible products and processes in the leather industry. The aim is to create measurable advantages in the form of reduced emissions, the elimination of health risks and a smaller product carbon footprint (PCF) to conserve energy and protect the climate. ☺