

## THE ECONOMIC ADVANTAGES OF THE CIRCULAR ECONOMY IN THE TANNING INDUSTRY

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The leather production process involves converting raw hides, an easily rottable raw material, into leather - a durable material that can be used to produce a wide range of products. The entire process consists of a series of complex chemical reactions and mechanical processes. These include tanning, which is the basic stage of the process, as it gives the leather durability and a specific character. The preservation of leather by tanning and a number of other stages of its preparation and finishing leads to the creation of a final product with specific properties. Leather is a raw material used to produce various products, for which it is often the most important starting material. These include shoes, clothing, leather goods, furniture, upholstery for cars, boats and planes, and many other everyday items. The above different uses require different leather types. But leather processing always generates by-products, and the type of leather has only little influence on it.

Regulations on pollution control, waste minimization and disposal, proper use of chemicals and accident prevention are key elements in minimizing the potential impact on air, water and soil from the leather processing industry. Best available techniques will be assessed against these criteria and may therefore involve changes to both process modules and downstream pollution reduction techniques.

Environmental innovations in the leather industry are typically focused on chemicals. In Poland, with a processing volume of approximately 21,000 tons of raw leather (2018), approximately 12,600 kg of solid waste and approximately 70,000 m<sup>3</sup> of liquid waste are generated. The proportions between individual types of waste may vary depending on the type of leather and specific tanning technologies used.

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The transition from a traditional, linear economy to a Circular Economy in the tanning industry is not only an environmental necessity, but above all a strategic business decision that brings significant economic benefits. High and growing disposal costs and increasingly stringent legal requirements in the field of environmental protection and circular economy constitute a strong motivation for the tanning industry to invest in innovative technologies that allow for effective and sustainable waste management, transforming it from a problem into a resource.

The circular economy concept, promoted both at the EU and national level, assumes minimization of the consumption of raw materials and the generation of waste. In circular economy, every material is treated as a potential raw material for reuse. Principles such as the "6Rs" (Refuse, Reduce, Reuse, Repair, Recycle, Rot) provide guidelines for businesses. The project of valorization of chrome tannery waste fits perfectly into the idea of circular economy, transforming waste into valuable raw materials (proteins, chrome) and energy (biogas), which is in line with the latest trends and legal requirements.