

WHITEPAPER

ecoSimplicity

Sustainable leather production based on renewable solutions and improved, efficient processes in wet end

Introduction

From Simplicity to ecoSimplicity

Simplicity is the Royal Smit & Zoon concept for reducing the complexity at the heart of a tannery: the leather making process. We simplify and boost the efficiency of post-tanning operations. This approach demonstrates that by rethinking and simplifying conventional processes, high quality leather can be achieved in terms of looks, handling and other properties.

ecoSimplicity takes it a step further. It is a helping hand in your quest for lean processes as well as for an environmentally friendly leather production. Adopting the ecoSimplicity approach can lead to savings in water and energy usage, less waste, improved renewability of leather and a reduction in production costs. Most importantly, it will differentiate you as a sustainable and future proof tanner, optimizing working methods and creating leather articles in a more ecofriendly way.

The solutions that we provide enable to improve towards full circularity and reduce your footprint in manufacturing leather. With ecoSimplicity we are combining our longtime experience in simplifying processes with implementing innovative, renewable chemicals.

A shift towards bio-based solutions

Royal Smit & Zoon promotes the use of leather chemicals based on bio-based ingredients. We innovate with chemicals based upon a higher renewable content, by replacing fossil-based materials for bio-based alternatives.

We offer renewable or bio-based (wholly or partially) leather chemicals that provide excellent leather performance and easy handling during the leather making process as well as an optimal effluent treatment process with minimal environmental footprint.

[Download our Renewability range product brochure](#)

for an overview of our bio-based solutions.



Benefits of ecoSimplicity for you as a tannery

ecoSimplicity helps tanneries to transform traditional practices into more environmentally friendly leather making processes. ecoSimplicity integrates renewable solutions into your leather recipes, while improving post-tanning and wet end processes. Of course without compromising on the quality of your leather. A win-win. ecoSimplicity means lower emission levels for your tannery, savings on energy and water usage and the better option for our planet.

Main benefits of ecoSimplicity:

- The leather making process involves **fewer steps**
- It enables **water and energy saving**
- It improves effluent treatment
- **Safer for operators** because there is less handling involved on the busy factory floor
- More renewable leather

How does it work?

We start by performing a (re)design of a leather recipe based on the criteria from an eco-design¹ philosophy. The data is collected in advance per article and per batch and matched with the redesign process. It is not a quick and easy process, but each improved process and article will add up to a more efficient and sustainable way of working.

Why ecoSimplicity?

The driving force for ecoSimplicity is our desire to ensure a clean and healthy work and living environment, without compromising on leather quality or increasing operational costs. The small-scale trials and the experiences since the introduction of the Simplicity concept, show savings in terms of water and energy usage by carefully shortening the processes.

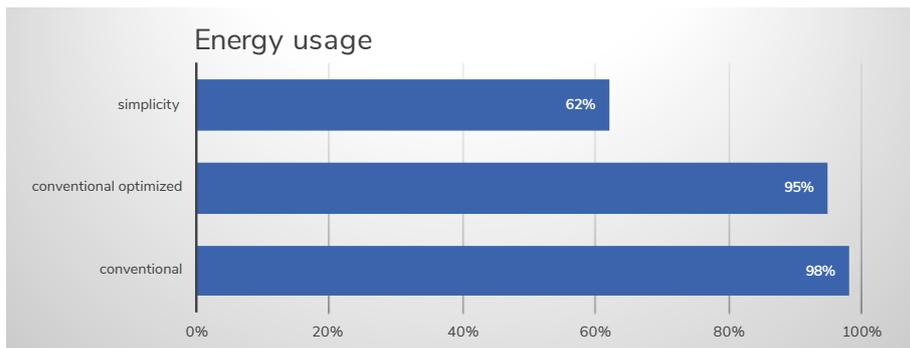
ecoSimplicity fits in Royal Smit & Zoon's mission to take responsibility and to contribute to the sustainable conservation of nature and our environment. The running times, processing at higher drum speeds, and substantial amounts of water used during post-tanning operations, have a proven negative impact on a tannery's total energy and water consumption.

The ecoSimplicity concept supports the requirements of the Leather Working Group's (LWG) Protocol 6 auditing process, which indicate that water and energy saving measures are important to qualifying for the highest rating. ecoSimplicity is also a reaction to the European Commission's continuing position and those of leading fashion brands and automotive OEMs in developing sustainable products and implementing a more efficient and sustainable process. Best Available Technologies which are recommended for the use of short floats in all processes have been implemented in the ecoSimplicity process by setting specific parameters for water usage.

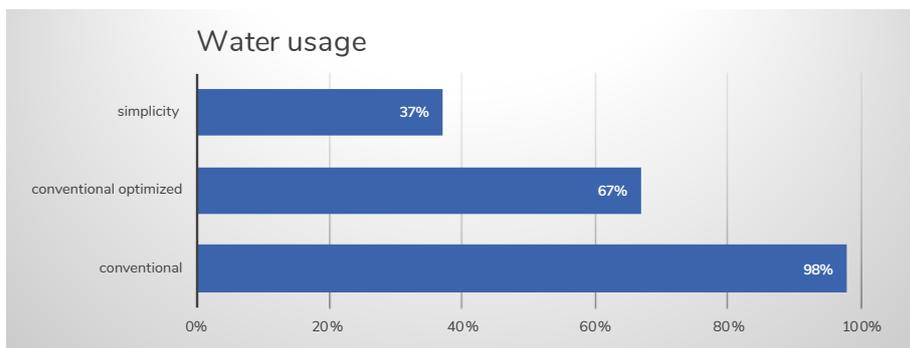


How much energy and water can be saved with ecoSimplicity?

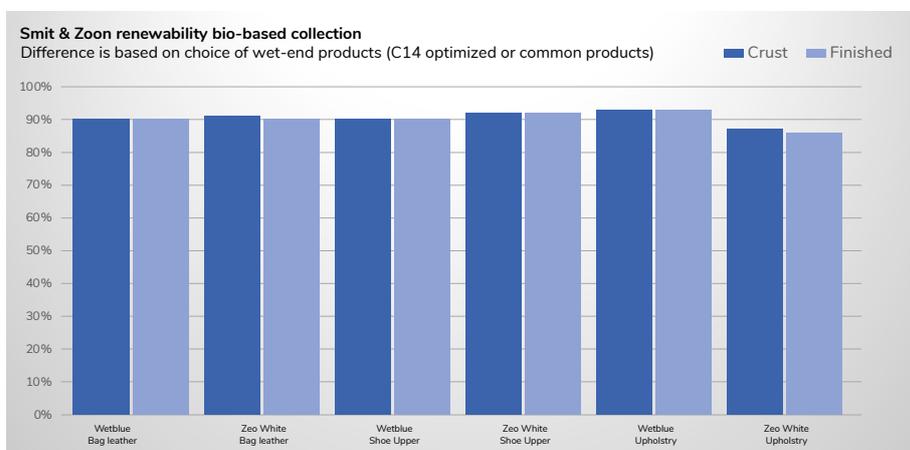
These graphs are based on the total amount of energy and water used during all steps of the process in small-scale experiments. The results for processes applied to large-scale production will differ. Nevertheless, these results show that by implementing the ecoSimplicity concept and rethinking your post-tanning operations, you can achieve genuine on the amount of water and energy. On average, we have achieved a **30 percent saving on total energy usage.**



On average, we have achieved a **60 percent reduction in water usage.**



And for the optimization with renewable chemicals, we were able to achieve high performance shoe, leather good and upholstery articles with a bio-based level based on the C14 method of more than 90%.



How does the environment benefit from ecoSimplicity?

The environmental impact of ecoSimplicity is related to the use of more renewable chemicals and savings in water and energy. The reduced water quantities and shorter overall running times require less energy for heating and therefore reduce the CO2 footprint of the product as well. The results shown here come from a small-scale project and from a set of leather produced using as much as possible renewable chemistry. The outcome proves there is real potential to cut costs through reducing water and energy usage.

Can ecoSimplicity reduce the costs?

The aim of ecoSimplicity is to reduce the impact on water usage and energy resources (including energy and fossil based raw materials). The cost of water is still low in real terms, but water prices are expected to rise gradually over the coming years. Experts estimate within the next 10 to 15 years that water will be 1.75 to 2.5 times as more expensive as it is today and will become an increasingly important economic factor. The full savings in terms of water, energy and wastewater effluent streams need to be determined during full scale production. Renewable chemicals often have a higher price due to their main raw material origin so the final cost of leather per square meter or square feet will be different.

What are the parameters for ecoSimplicity?

EcoSimplicity goes beyond the current recommendations made by government authorities and other bodies such as the LWG in terms of saving water and energy. Our current parameters for the post-tanning process are:

- Six hours running time (in-between washing cycles excluded)
- Two process steps
- Three retanning agents (acrylics excluded)
- Three fat liquors
- Use of chemicals with a higher renewable content (in its product segment)

Although, it may not be possible to achieve the desired leather article in every (re)design, these are the starting points.

These parameters can be applied to leather of average commercially available quality. We have not included the washing cycles because their duration varies considerably from tannery to tannery and the impact needs to be calculated individually. Washing is primarily done with a closed-door, called "batch washing". "Running-water washings" washing with an open draining lid are not considered best practice because of the large and uncontrolled quantities of water usage.

Re-chroming: this is not an integral part of any post-tanning operation. If re-chroming proves to be essential, the needed time must be added to the total.

Acrylic retanning agents: These are not an integral part of any post-tanning operation. However, their use will not add to the maximum production time.

Processes depends on origin of hides and their demand but ecoSimplicity can be integrated accordingly without compromising on end results.



Will ecoSimplicity work...?

... thinner leather may tear or knot in short floats?

The rules for relating float length to thickness are unchanged in ecoSimplicity processing. Thinner leather require greater float lengths.

... short floats cause creases that remain visible?

The main causes of creasing are overloading the drum and unwanted downtime during processing. Wrong overnight piling is another cause. EcoSimplicity processing will not lead to creases, providing modern equipment is used or existing equipment has been adapted to short floats.

... less washing and one-bath processes lead to uneven colour?

Dyeing depends on the choice and amount of the other chemicals used during the process. Tanners need to avoid using an excessive amount of retanning agents and make sure they only use products that are made of ingredients the leather benefits from. Once these conditions are met, the short float improves the distribution of the applied products.

... fixation in short floats leads to uneven colour?

Using a short float in itself does not lead to uneven dye processes. Uneven coloring is mainly caused by other mistakes in the production process. The ecoSimplicity process involves a longer float before fixation so there is more time for even dye distribution.

... the increased movement will cause frictional damage.

We do not recommend using short floats in certain cases involving sensitive materials. However, all the other parameters in the ecoSimplicity program should still be applied.

... shorter floats require more, not less energy, to drive the vessel?

Using short floats entails starting and rotating less balanced process vessels. This does lead to an increase in electricity use but is counteracted by the shorter process and subsequent reduction in the amount of water being heated.

... short processes mean less time for fixation and thus cause a higher COD?

Using less water improves the way the fixation product is distributed in the leather. It boosts the conditions for optimal fixation and cuts the amount of unused product discharged in wastewater, an additional environmental benefit.

...just exchanging chemicals.

It is more than just replacing one wet end chemical for a chemical with a higher bio-based content. The biggest effect is created when optimizing a complete leather recipe. Not only for obtaining the highest possible bio-based leather article, but also to gain the key environmental benefits, like reduced water and energy usage and less waste.



ecoSimplicity: a promising way of rethinking the tanning process

The results we have achieved through experiments are both promising and stimulating. We are convinced they demonstrate high potential for cutting costs through reducing the use of water, energy and processing time in your post-tanning processes.

Your regular contact can support you in optimizing your processes.

We are here to support you

With in-depth knowledge on renewability and C14 content of our products, we can provide excellent support when developing leather articles with high bio-based content. We assist from process to products and optimize your leather recipes.

Is your company concerned about boosting the sustainability of the leather processing industry and are you ready to play a pioneering role? Contact us and find out how your company and Royal Smit & Zoon can together work towards a sustainable future.

Laurence Irwin

Global Product Manager

laurence.irwin@smitzoon.com



Rethink your working methods.

Let's increase sustainability and cut costs through working more efficiently, together.



Royal Smit & Zoon

Nijverheidslaan 48
1382 LK, Weesp
The Netherlands
www.smitzoon.com

