

Understanding the impacts of wet processing: Finishing



This document introduces and highlights the key environmental impacts of common finishing techniques as well as lower impact options.

It has been developed as part of the Sustainable Clothing Action Plan (SCAP). SCAP is a collaborative agreement to improve the environmental impact of clothing. See wrap.org.uk/scap2020

What is wet processing and why is it so impactful?

Wet processing refers to any process that uses liquid to pre-treat, dye, print or finish a product. This stage of the product lifecycle has a notable environmental impact using vast amounts of water, energy and often hazardous chemicals.

Finishing is a series of processing operations applied to a textile material to improve its appearance, handle and/ or functional properties.

Introduction

Softeners

Water Repellents

Denim

Wet Processing
Benchmark

Softeners

Conventional

Silicone Softening

Silicone softeners are widely used and often applied to give a softer hand feel. Depending on when and how it is applied, this process can consume a significant amount of water, particularly when considering that the end result is both subtle and temporary.

Chemical issues also arise as some silicone types are environmentally toxic and carcinogenic.

Less impactful

Lower Water Applications

Where silicone softening is deemed necessary, there are lower-water application processes available that use bubbles or sprays to apply the softener rather than a water bath.

These processes minimise the amount of softener used while also saving water and reducing the wastewater treatment burden.

Introduction

Softeners

Water Repellents

Denim

Wet Processing
Benchmark



Water Repellents

Conventional

Durable Water Repellent Treatments

Conventional durable water repellents are based on a chemical group called Perfluorinated Chemicals (PFCs) which make the products water repellent, as well as oil and stain-proof.

PFCs are amongst Greenpeace's 11 priority chemical groups for elimination. This is because PFCs do not easily breakdown in the environment and some chemicals within the group have been found to be hormone disrupting, carcinogenic and toxic to reproduction.

Less impactful

PFC-Free Treatments

Non-PFC alternatives are available for most applications, such as water proofing. One area which has proved more challenging to replicate is oil repellency, however as technology develops in this area it will likely be addressed.

Introduction

Softeners

Water Repellents

Denim

Wet Processing
Benchmark



Denim Finishing

Conventional

Bleach shading

Bleach shading is a harsh chemical process and can use formulations which are hazardous to human health. Additionally the bleaching process requires high temperatures and a series of rinsing processes increasing its energy and water footprint.

Less impactful

Enzyme Finishing

Enzymes are proteins that can catalyse reactions. They can be used in the finishing process as a substitute to corrosive chemicals. Enzymes can be combined with other processes, leading to water and time savings.

Ozone Finishing

Highly pressurised ozone can be used as a replacement for harsh chemicals. Through ozone finishing, it is possible to achieve a worn or vintage look.

Additionally, different looks can be achieved by using wet or dry ozone processes. Using ozone can achieve significant savings as no or minimal amounts of water are used. Operational health & safety controls need to be in place as ozone gas is toxic.

Laser Finishing

Laser finishing is a dry, low energy process that can replace sandblasting, stone washing, acid washing, bleaching and other processes. It can also be used to create entirely new effects that were not possible before.

Introduction

Softeners

Water Repellents

Denim

Wet Processing
Benchmark

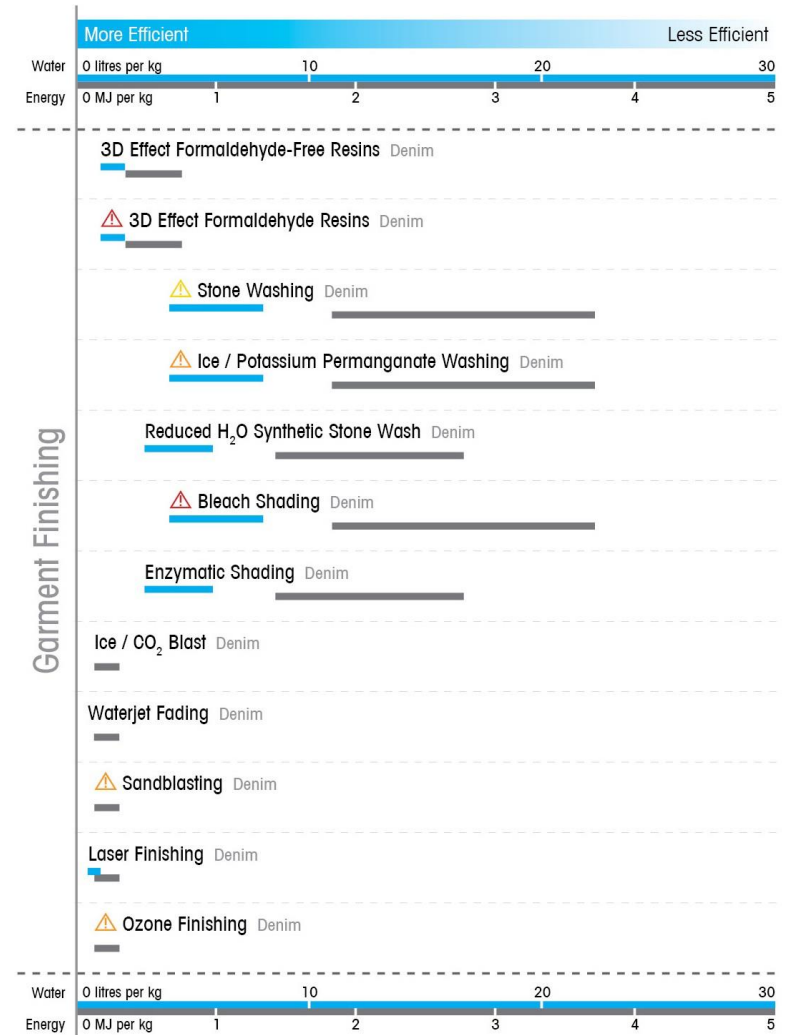


Wet Processing Benchmark

To better understand the quantitative impact of common pre-treatment processes, view MADE-BY's publicly available Wet Processing Benchmark.

The Benchmark helps brands and retailers understand the range of impact that common wet processing techniques have in terms of water and energy. It can also be used as a tool to help the viewer better understand their efficiency compared to industry averages.

made-by.org/benchmarks



Introduction

Softeners

Water Repellents

Denim

Wet Processing
Benchmark



WRAP's vision is a world where resources are used sustainably. It works in partnership with governments, businesses, trade bodies, local authorities, communities and individuals looking for practical advice to improve resource efficiency that delivers both economic and environmental benefits.

While we have tried to make sure this case study is accurate, we cannot accept responsibility or be held legally responsible for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. This material is copyrighted. You can copy it free of charge as long as the material is accurate and not used in a misleading context. You must identify the source of the material and acknowledge our copyright. You must not use material to endorse or suggest we have endorsed a commercial product or service. For more details please see our terms and conditions on our website at www.wrap.org.uk

Our mission is to accelerate the move to a sustainable resource-efficient economy through:

- **re-inventing** how we design, produce and sell products;
- **re-thinking** how we use and consume products; and
- **re-defining** what is possible through recycling and re-use.