De Rigueur.Green

.STOCKS

A 2022 guide process for Fashion Waste Management

MANIFESTO

Raw Material Deadstocks, Production Leftovers, and Unsold Articles represent a significant loss for fashion houses nowadays.

We asked ourselves how we could reduce this loss of economic and ecological value.

This report aims to provide concrete solutions to these major problems, and to present the DeRigueur.Green approach, deep diving into how we can help you develop innovative and eco-designed collections.

De Rigueur is a Product Innovation Bureau, providing engineering and digital support over product innovation projects for global fashion & luxury brands.

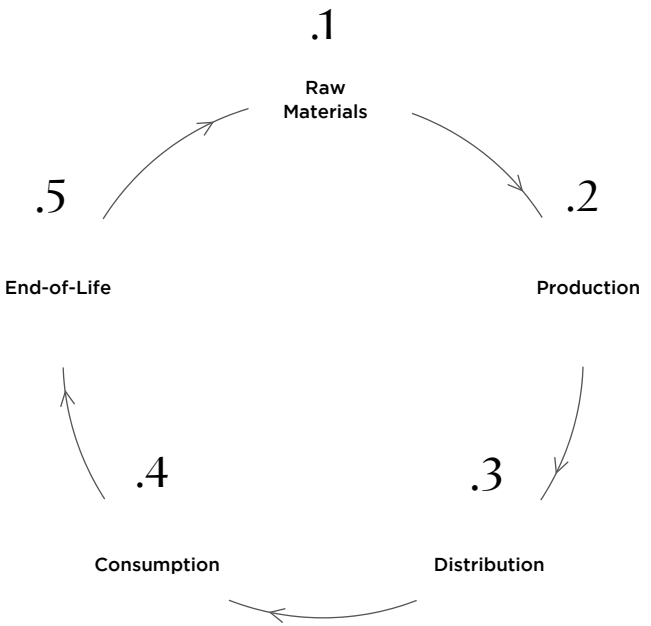
With derigueur.green, our ambition is to provide tangible solutions to brands, on the subjects of Design and Production, to help them better manage their resources and reduce their environmental impact, based on a simple triptych:

REDUCE / REUSE / RECYCLE

OVERVIEW

01 CONTEXT

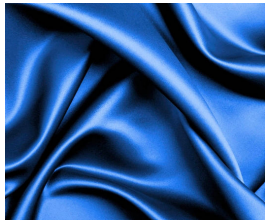
VALUE CHAIN OF FASHION PRODUCTS



PRODUCT LIFE-CYCLE

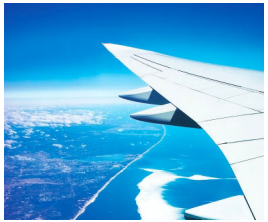
Value Chain of Fashion Products

Raw Materials



Production

Logistics

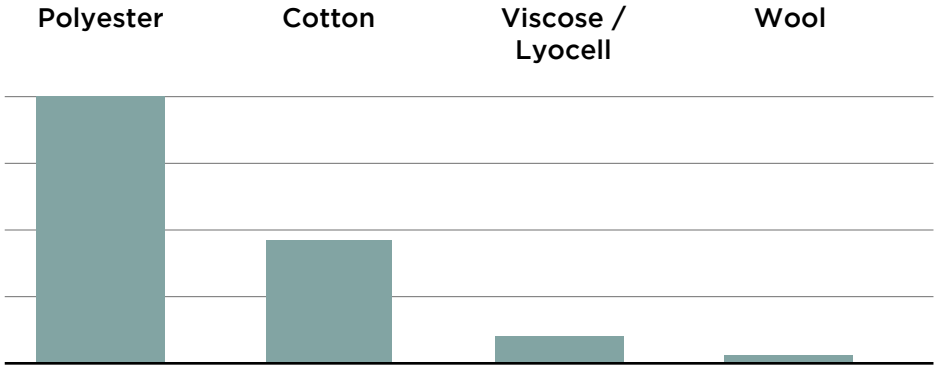


Consumption

End of Life

RAW MATERIALS

Top 4!



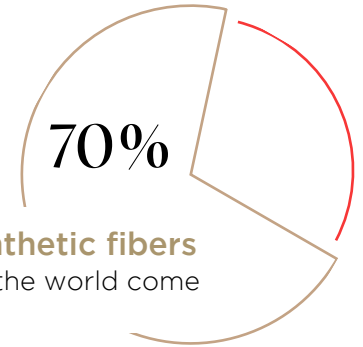
Most produced: 39.7million tons (2015)

17.7 million tons (2015)

3.7 million tons (2015) - could triple by 2030.

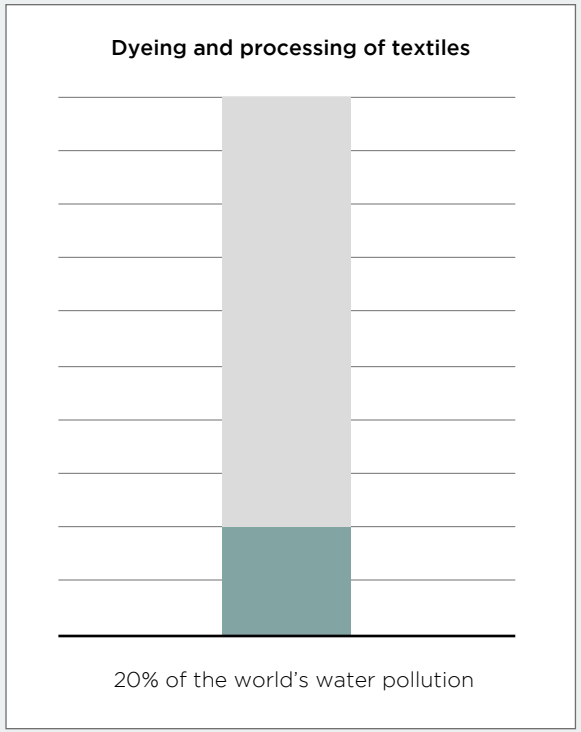
900 thousand tons (2015)

Data Source : ADEME (La mode sanSdessus-dessous - 2018)



70% of synthetic fibers produced in the world come from oil.

PRODUCTION



Dying Processes

To dye clothes, manufacturers often use toxic substances such as :
ethoxylates, azo dyes, phthalates, formaldehyde, etc...

Practical substances but ultra-toxic for the workers who make our clothes, for the consumers, but also for the aquatic ecosystem.

20% of the world's water pollution is attributable to the dyeing and processing of textiles.

DISTRIBUTION

Carbon footprint

Clothing, bags and shoes are often manufactured on the other side of the world. In order to deliver to stores quickly and keep up with the fast pace of collection changes, transportation must be smooth and fast.

For retailers and brands, it becomes cheaper to pay for fuel to transport clothes than to have them made in Europe.

Because it is the fastest, the airplane is often the most used means of transportation, but it is also an emitter of greenhouse gases, responsible for climate change.

CONSUMPTION

The biggest problem lies in all that is released during washing.

Micro-particles of nylon, polyester, elastane, or acrylic emanating from our clothes, end up in the ocean. This is the main source of ocean pollution ahead of plastic bags.

The detergents can be very polluting when they contain perfumes and substances that are not very biodegradable, such as surfactants.

The perfumes of detergents and softeners can be very allergenic for human beings when the garment comes into contact with the skin.

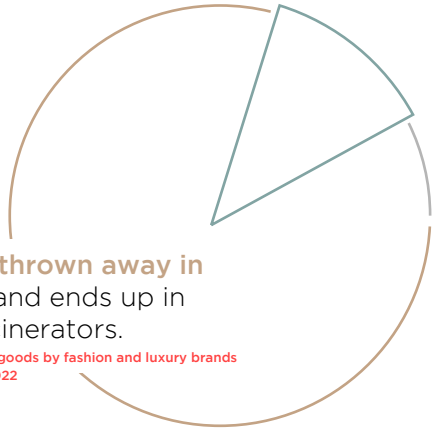
katy-perry

END OF LIFE

In Europe,
4 million tons of textiles
are destroyed every year

12%

of the clothes are **resold in second hand**.

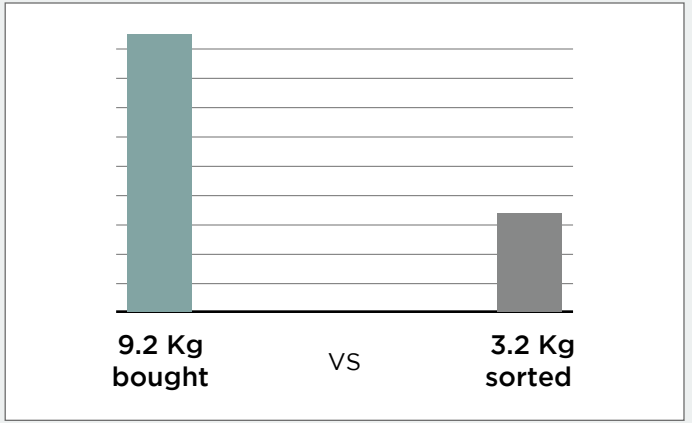


80%

of clothing is **thrown away in the garbage** and ends up in landfills or incinerators.

! The destruction of unsold goods by fashion and luxury brands will finally be banned in 2022

Data Source : ADEME (La mode sanSdessus-dessous - 2018)

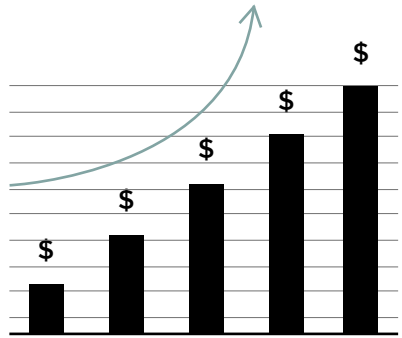


Each French person buys an average of 9.2 kilos of textiles and shoes per year, while only 3.2 kilos are sorted.

CRAIG MCDEAN

REDUCING ENVIRONMENTAL IMPACT

NEED FOR ADDED VALUE



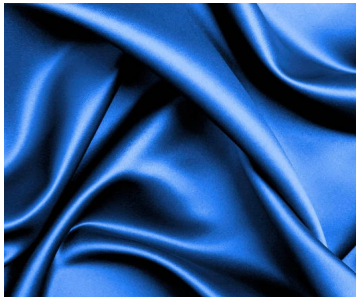
Thanks to these datas, we've seen that environnemental impacts are everywhere in the supply chain.
But they are not the only issue. Fashion brands and manufacturers also meets a lot of material losses through that chain.

In addition of wasting a polluting material, these losses are also a source of loss of value. Facing that, our objective is to reduce the environmental impact(s) of these losses by exploiting them as raw material and giving them a new value.

MAIN ISSUES

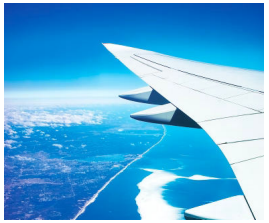
Product life-cycle

Raw Materials



Production

Logistics



Consumption

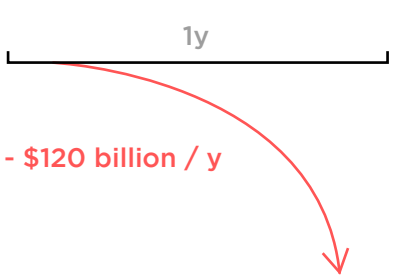
End of Life

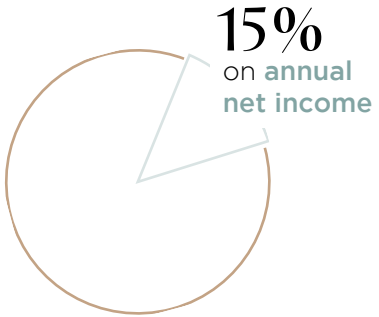
Overstocks

Offcuts

Unsold Goods

OVERSTOCKS





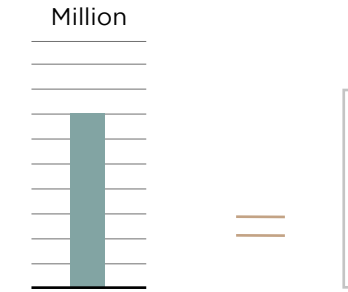
Each year, unused fabric costs the fashion industry approximately $120 billion.

For large companies, this can represent a 15% impact on the annual net income.

Data Source: BOF - According to an analysis by online marketplace Queen of Raw.

Benjamin Benmoyal

OFFCUTS



7 million garments produced per month

300 Tons
Textile waste

Need for creating value from production Leftovers

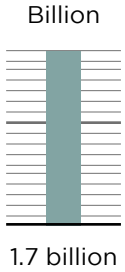
Reverse Resources Study

ZENZEL

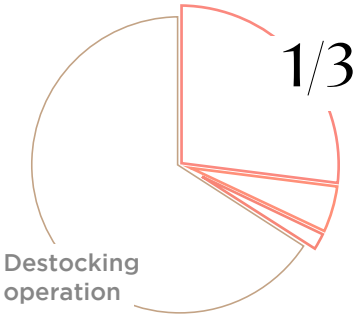
UNSOLD GOODS

Unsold Fashion Products Rate

4%
of companies' **turnover**



Unsold Products: Distribution



Ademe

Marine Serre

02 INITIATIVES

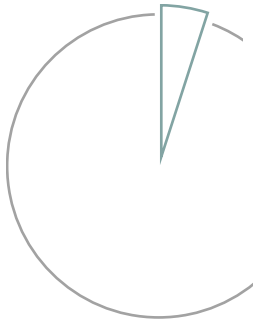
Jeanne Friot

"When I was working in large luxury houses, I was struck by the **quantities of beautiful fabrics forgotten** by the luxury houses **after production**. They slept in sheds for several years, when some of them were sold to discounters who **sold** them **in bad conditions**. Others were even **destroyed**. Too few were recycled".

Romain Brabo

SOURCING

Deadstock



5%

of purchase volumes
end up as deadstock

Nona Source

SOURCE
REFERS TO THE
SOURCING OF MATERIALS.

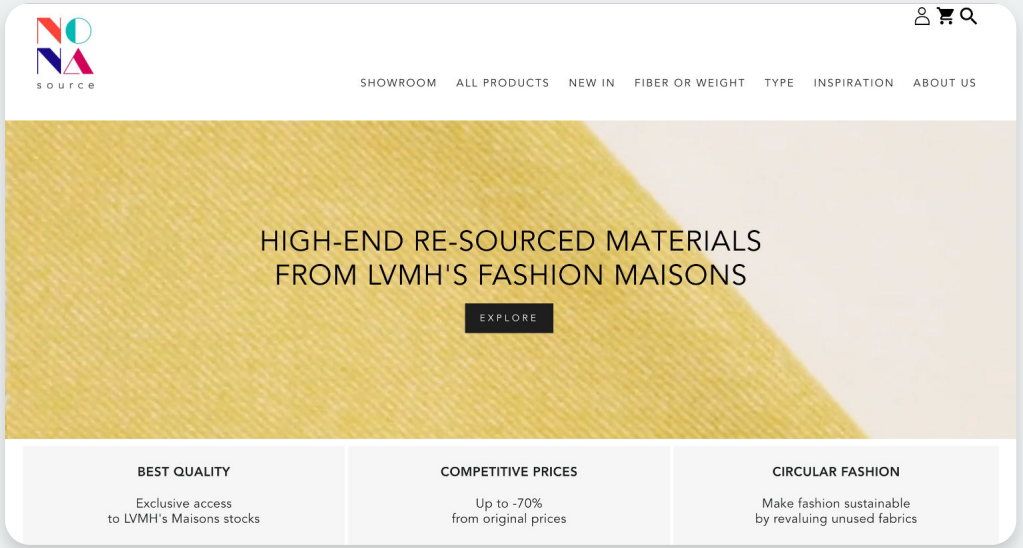
NONA SOURCE
ALLOWS THE RENEWAL
OF RESOURCES.

NONA-SOURCE is the first online resale platform which re-values deadstock fabrics and leathers from the most exclusive French Maisons de Couture. Nona Source allows Creatives to easily access high-quality materials whilst encouraging the Creative Re-use of existing resources.

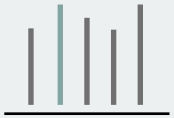
Nona Source supports Creatives, encourages Circular Creativity and promotes Creative Reuse.

DEADSTOCK REVALUATION

HIGH-END RE-SOURCED MATERIALS



1000 color references



175 000m of fabrics available online

90 000m of fabric sold

SOURCING

adapta_

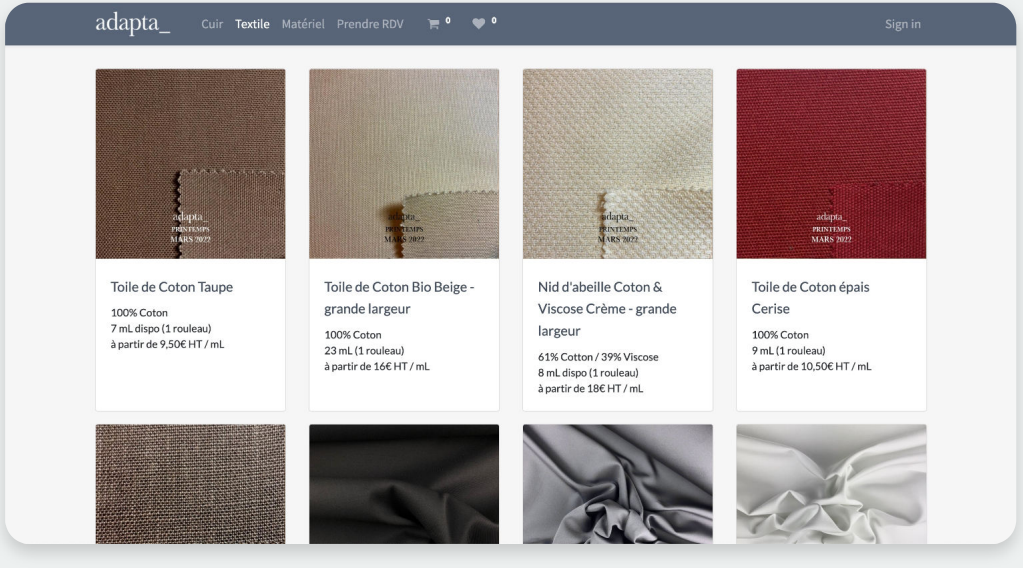
Adapta selects for its clients, high-end leathers and textiles that are lying dormant in the stocks of luxury houses and associated suppliers.

On the one hand, suppliers reinvent their way of managing their stock while being reassured about the traceability of their products.

On the other hand, designers have access to high-end skins, while controlling their budget. This win-win relationship is built on trust and transparency.

DEADSTOCK REVALUATION

BETTER THAN YESTERDAY BUT NOT AS WELL AS TOMORROW



Over **300 m2** per color (Leather)

Over **1000** linear m (Textile)

550 + Customers

PLATFORMS

$$

FASHION HOUSES

- Thefabricsales
- UpTrade
- Upcybom
- Adapta
- Nona Source

$$

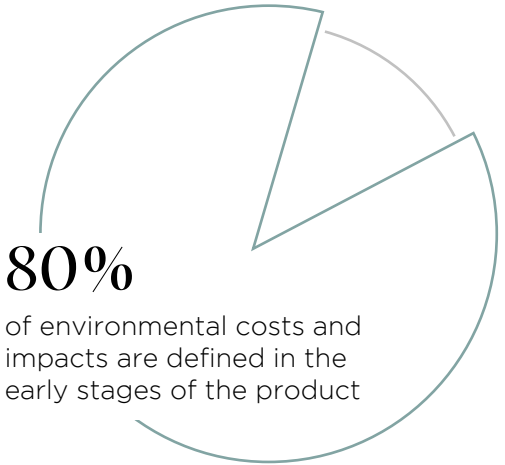
Ksenia Schnaider

8IGB

DESIGNER /
SMALL BRANDS

A.I. TREND FORECASTING

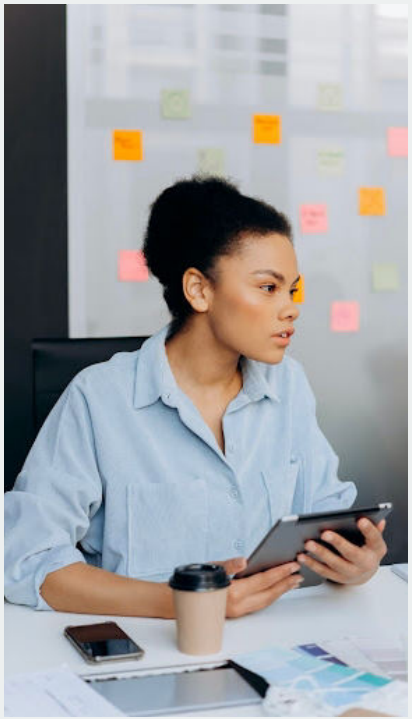
Life-Cycle



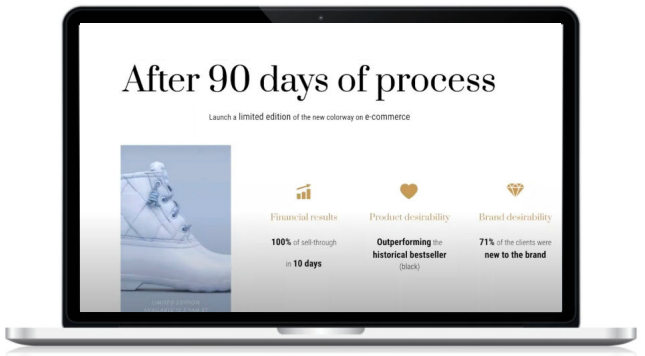
80%

of environmental costs and impacts are defined in the early stages of the product

AD Magazine



heuritech



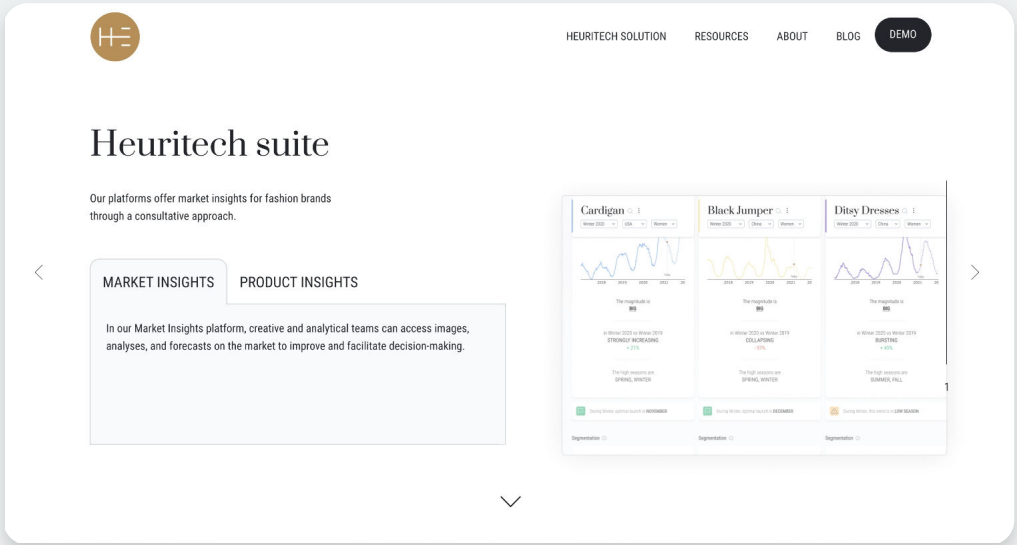
A platform where fashion brands can clarify their vision of their market via images, analyses, and forecasts.

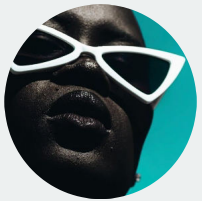
VOGUE

"Heuritech has turned social media into an artificial intelligence tool that predicts the development of trends"

REDUCE OVERSTOCK

AVOID DECLINING TRENDS WITH ACCURATE FORECASTS AND BETTER DEMAND PLANNING





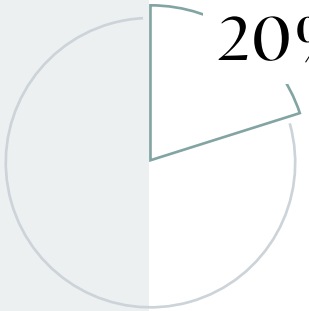
Heuritech could be of interest for companies seeking to reduce overstock.
Such a solution allows to avoid declining trends with accurate forecasts and better demand planning.

How does it work?
The company has developed a technology combining the science of A.I. with a fashion expertise. They analyse million of images on social media to spot key trends worldwide with a one year forecast.
Their methodology is done in 3 steps : first they are looking at what consumers and influencers are wearing, then they apply their image recognition technology to detect fashion details, and finally processing the data with their own forecasting algorithm predicting what's coming next.

They own an online platform providing a data driven trend forecasting for merchandising, product, design & marketing teams to get predictive analytics on markets trend dynamics, and consumer segmentation as well as inspirational mood boards to help their clients build their collections.

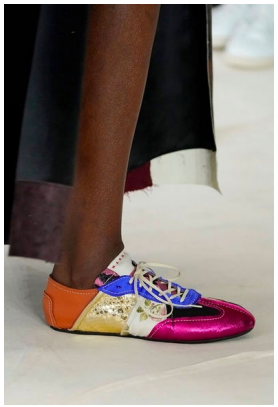
"More than **20%** of production waste (**Leftovers**) is **reusable material"**

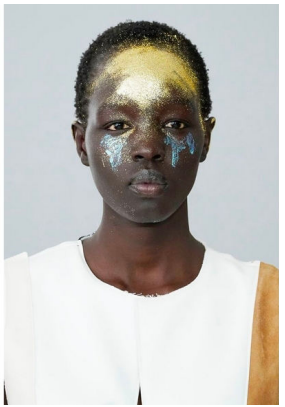
REVERSE RESOURCES STUDY



20% REUSABLE MATERIAL

WASTE FORM PRODUCTION



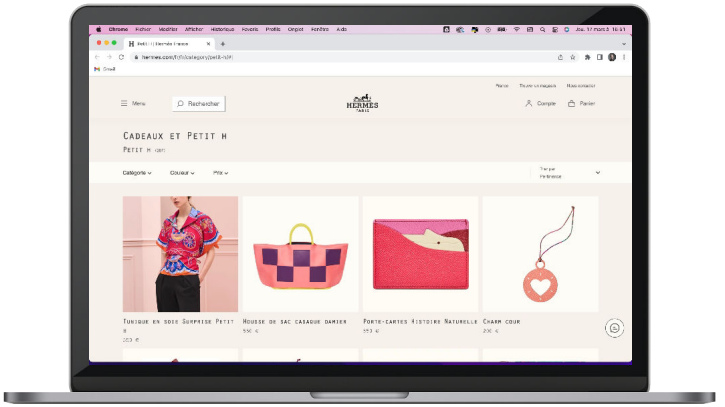


PRODUCTION LEFTOVERS

Hermes Petit-h

Starting with materials and more specifically surplus materials to create new products: this is the principle behind Petit h, a Hermès business dedicated to reusing scraps and excess materials to create objects and accessories with unique combinations.

Petit h is one of the first circular initiatives in luxury. The workshop was created in 2010 by Pascale Mussard (the former co-Artistic Director of Hermès), based on a simple concept: to recover unused materials from all the Hermès universes and from the other brands of the group (Puiforcat and Cristalleries Saint Louis) to make new objects, in limited series, when they are not unique pieces.



HERMÈS
PARIS

PRODUCTION LEFTOVERS

Recycled Button

This project aims to create recycled buttons from cotton waste.

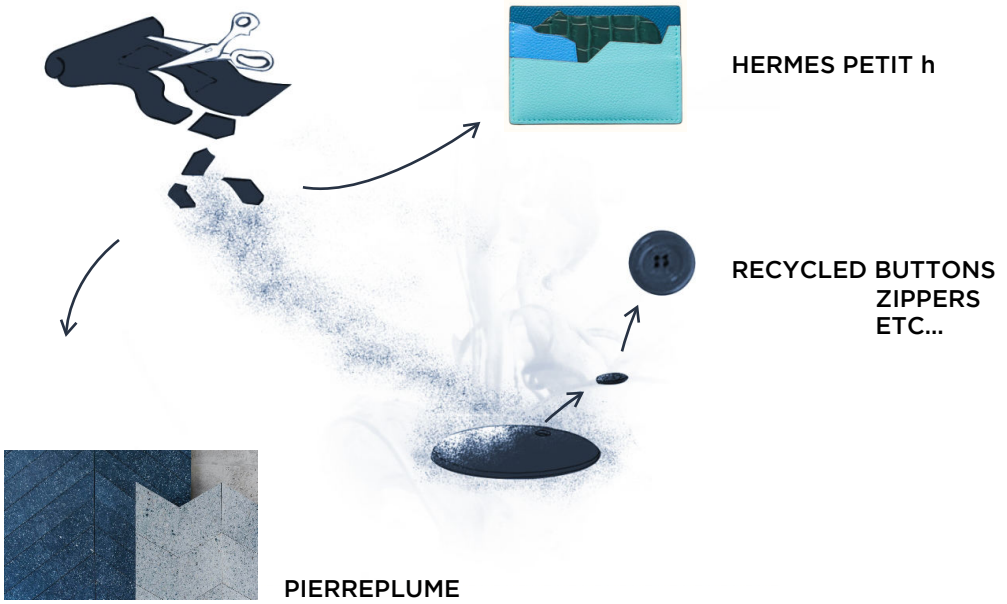
We first recovered production scraps from a company that offers an on demand textile production service.

Then, we contacted an industrial start-up that offers new and efficient materials thanks to an innovative process of powder metallurgy called Flash sintering.
This technique allows to design enhanced and eco-responsible materials to produce « hard » parts.

Finally, we called upon an industrialisation partner offering a custom-made service to bring the desired finishes to the products.

DeRigueur.Green internally developed

PRODUCTION LEFTOVERS



HERMES PETIT h

RECYCLED BUTTONS
ZIPPERS
ETC...

PIERREPLUME

RECAP

1- Starting with materials and more specifically surplus materials to create new products.

2- From material scraps to haberdashery pieces.

3- Sound-absorbing wall coverings or thermal insulation made of recycled textile from industrial production scraps or clothing recycling.

“There is no such thing as an environmentally friendly way of **burning clothes.”**

ORSOLA DE CASTRO

JAN
22

New law intended to limit this waste came into effect beginning of 2022

UNSOLD GOODS

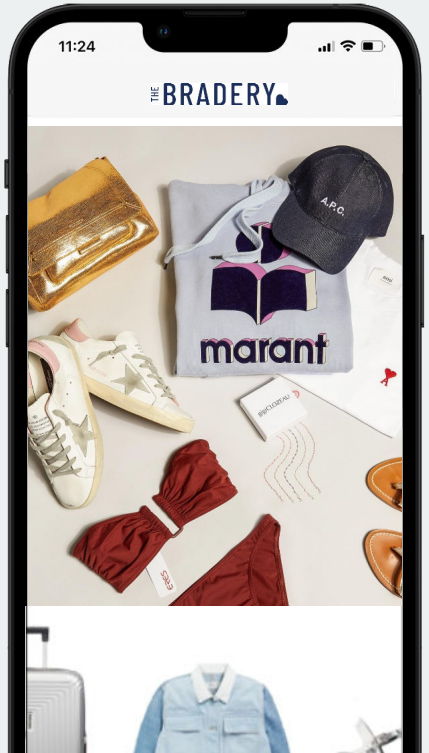
The Bradery

Operator of an online retail platform intended to assist customers to order products online, The Bradery defends the idea of a more responsible and affordable fashion, by (re)creating desire for forgotten pieces.

The company offers weekly private sales.
One or two sales per day, at 8am on the app and 9am on their website.

They offer brands destocking operations that have the advantage of offering a qualitative presentation of products, but also of reaching a younger audience, which is around 27 years old. The two main arguments are therefore the protection of the image and a rejuvenation of the customer base.

The Bradery has recently launched a C2C part on their platform (called From you to you), which allows customers to resell the products they bought on the platform.



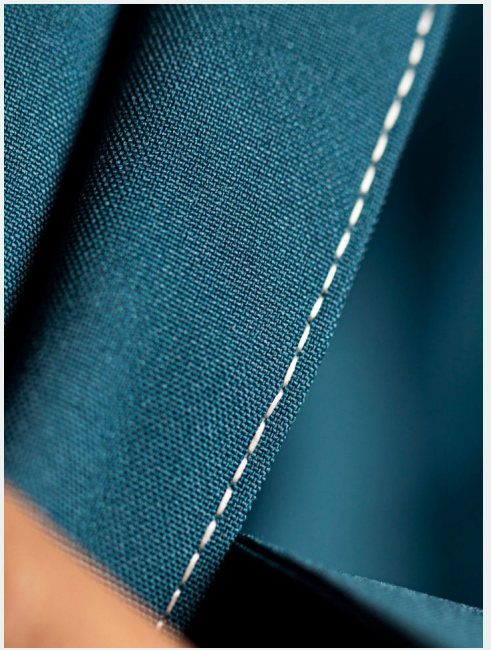
UNSOLD GOODS

Resortecs

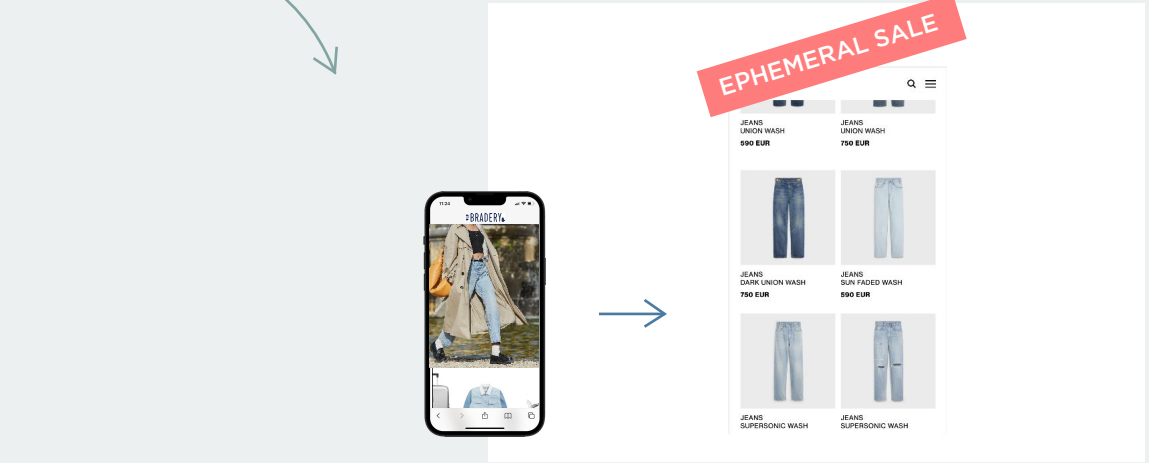
Resortecs develops heat-dissolvable stitching threads and thermal disassembly systems that make textile recycling easy.

The company combined thermal engineering, industrial design, and chemical engineering to develop a solution which is 5x faster than traditional disassembly and makes it possible to recycle up to 90% of garments' original fabric.

Textile recycling is made much easier.
Thanks to their solution, we can imagine a better end of life for the clothes with an associated after-sales service allowing to repair some parts (as - for example - the lining).

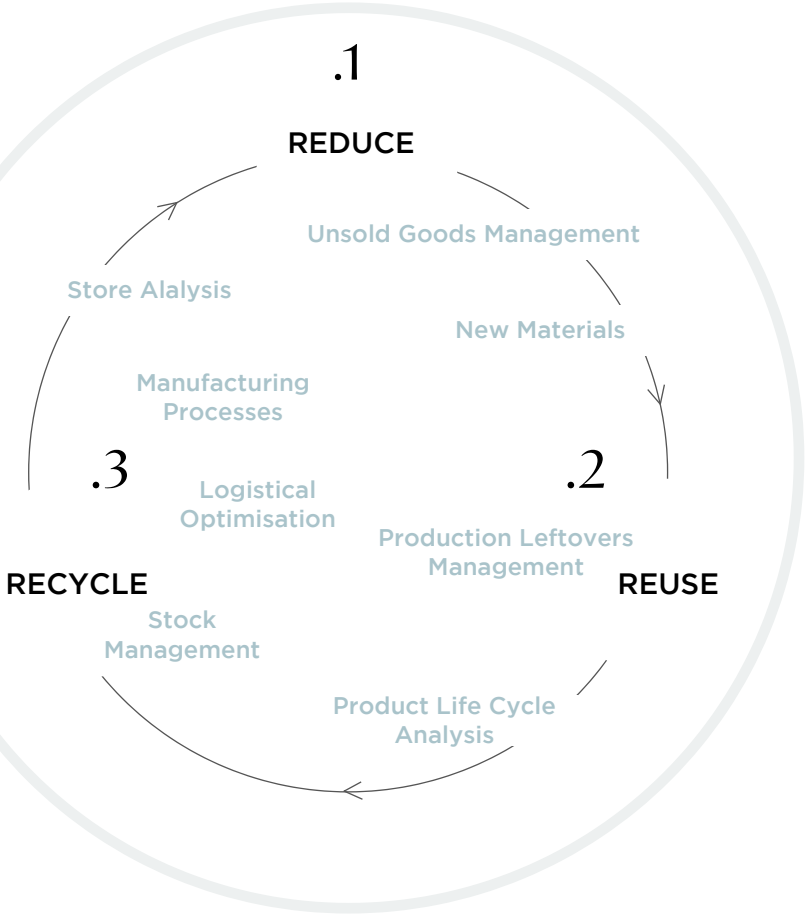


UNSOLD GOODS



03 METHOD

Ksenia Schnaider



Vision

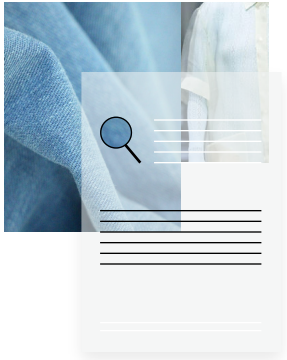
Our vision follows the 3 R statement and is organised around Reducing, Reusing and Recycling.

To face the material loss issues we can provide management solutions, innovative material development, life cycle analysis or advices about manufacturing processes. We believe solutions are various and we try to master them all so we can provide fashion brands the ones that are adapted to their need.

Our Methodology

01

Audit

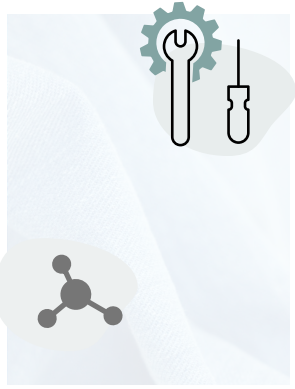


02

Stock Qualification

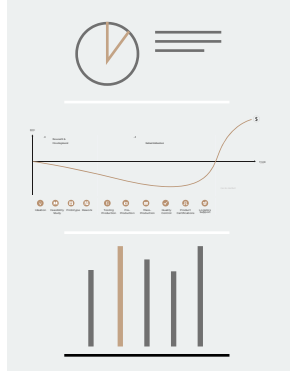
03

Identifying Solutions



04

Development of Technical/Industrial processes



05

Project Management

04 PROJECTS

Steven Passaro

INTERNAL PROJECT

Bethany Williams

01
Statement

This initiative is the result of a triple observation in the manufacturing process:

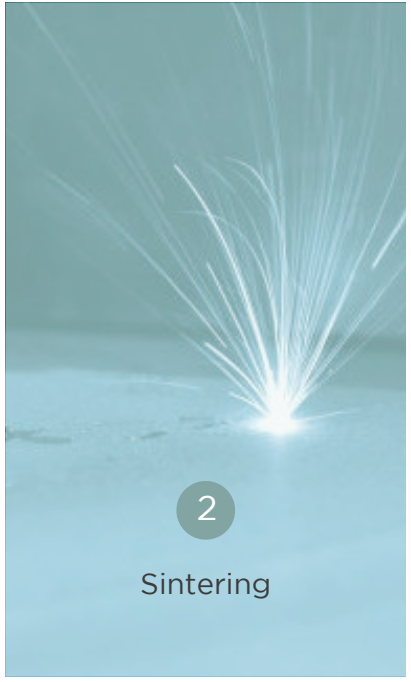
- The loss of economic and ecological value of "waste",
- The 2022 "loi AGEC",
- The technical obstacles to recycling "hard parts" are due to external disruptors such as buttons.

The petrochemical nature of the materials used for certain haberdashery components impedes the complete recycling of a garment.

From this observation, and as we were inspired by the Adidas Futurecraft Loop shoe, we wanted to create a single-material product that would have a similar approach, which is:

1st, identifying a sintering technology (a technology usually used for metals, which allows them to be crushed, reduced to powder and then re-injected into moulds to make new shapes).

2nd, reusing this process by adapting it to cotton fibres.



France

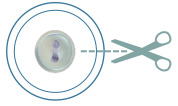
Reduction of the fibre

France

Densification, without addition of binders or additives: 100% cotton

France / Madagascar

Shaping, milling, etc...



Feasibility Study 02

For the fabrication process, we had 3 steps: First, the Grinding (which correspond to the reduction of the fibre). The technique of fraying allows all fabrics to be transformed into fibres in order to create new materials.

Then, the Sintering: flash sintering consists of agglomerating powders and thus obtaining high density plates. We tried this densification, without addition of binders or additives to have 100% cotton.
The challenge was to obtain a material as dense as possible and we tried several times with 100% cotton, but the result did not reached our expectations, it was too brittle.
The best option we found was a 50-50% melt of Cotton and Acetate.

Finally, shaping the buttons:
This part is about obtaining a finish result from the plates, by shaping, milling, etc...
We have done tests of resistance to abrasion, washing and humidity.

03
Prototype

The reception of the first plates revealed one main problem:

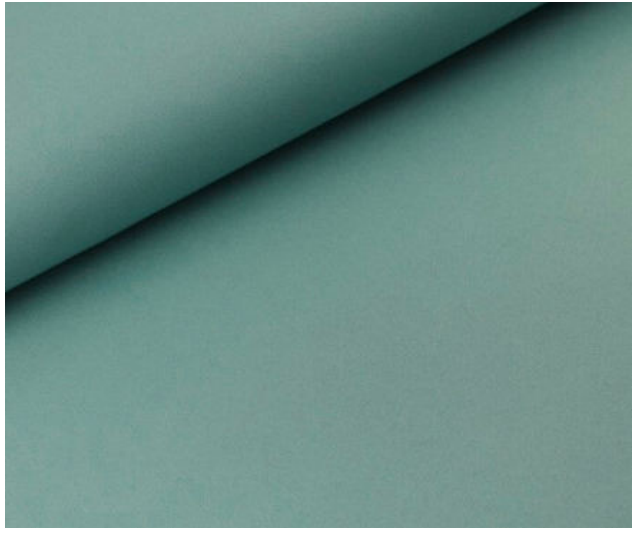
The cutting of the buttons inside the plates caused a loss of material.

We therefore reviewed our procedure to remedy this with a rework, using a mould approach.

The objective was to create moulds of 6 or 15 pieces in order to start from micro-pieces directly.

It should be noted that the more densified the material, the cleaner the cut will be.

CURRENT PROJECT



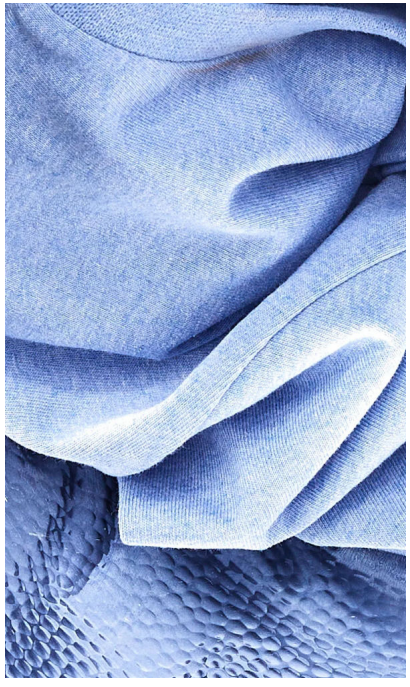
01
Statement

More than 40 M tons of polyester are made every year, its an oil based textile made through a polluting process. Because of polyester, about 500 000 tons of plastic microparticles are released into the world's oceans each year.

Polyester is not waterproof by nature and hydrophobic properties in sportswear come from water repellent treatments.

These treatments are usually PFC-based (perfluorocarbon), a synthetic substance that also pollutes water and environment and that is carcinogen and an endocrine disruptor according to Greenpeace.

We were mandated by a high hand sport brand to substitute polyester and PFC-based treatment by sustainable materials to develop a waterproof eco-textile.



02
Objectives

Density : about 140-160 gr/m2
Objectives : stick to polyester lightness, resistance and respirability / find a way to make it waterproof without PFC.

01

Waterproofing

02

Strength

03

Lightweight

Feasibility Study 03

1. Recycled polyester from ocean's plastic wastes and PFC-free treatments.

Issues : the fabric would still reject Microparticles in water.

2. Cellulosic fibres like Tencel, Piratex, Seacell or Orange Fiber, spin a thick yarn and weave a 150 gr/m2 fabric. Softer than polyester, with a better moisture absorption. Coating with a product like Bionic Finish Eco, fluorocarbon-free and does not affect the touch of the fabric. -

Issues : chemical solvents involved in cellulosic fibres and higher price.

3. Hemp mixed with GOTS cotton (20 %) woven into a high density fabric, tight enough to have natural water repellent performance bases. Hemp is a natural thermo-regulator and cotton has a good moisture absorption.

Issues : density would be more than 200 gr/m2 and higher price than the second lead.

Project

01

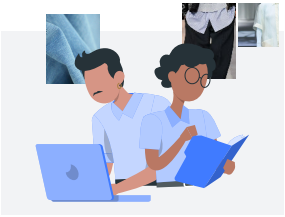
Production Leftovers
100% Cotton from production waste

02

Sintering Process
Manufacturing Process Analysis

03

Buttons
Manufacture and realisation of molds



01

Audit
•Material audit: inventory management analysis
•Logistics audit: stakeholder analysis
•Solutions audit: analysis of products and/or services to be implemented

02

Study
•Washing resistance
•Wear resistance
•Look & Feel

03

Deliverable (PoC)
•Manufacturing
•Molds realisation
•Technical file
•etc...

Methodology

05 WHAT'S NEXT ?

Bethany Williams

DYECOO

Dyeing

01

DyeCoo®

CO2 Dyeing

DyeCoo Textile Systems is a supplier based in the Nederlands, proposing water and chemical free textile dyeing solutions.
They are a research organisation that looks at using CO_2 to solve problems of various industries.

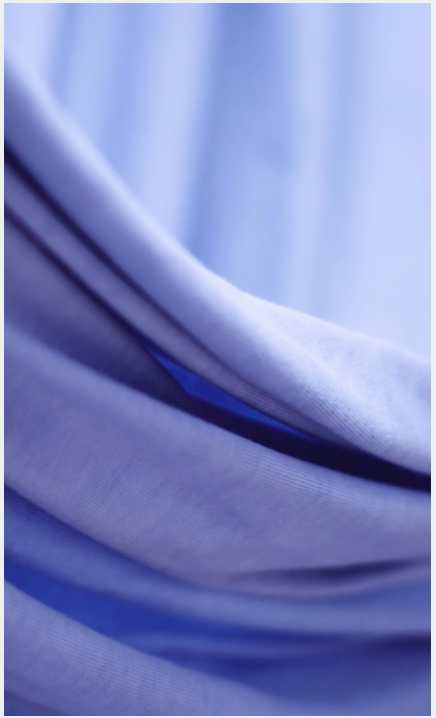
The technology of DyeCoo sounds quite futuristic: a machine pressurizes CO_2 until it becomes supercritical, which is a state in which it gains “a very high solvent power”.

The dye dissolves in CO_2 and gets transported deeply into the fabric’s fibres. Thanks to this method, there’s no need for water in the dyeing process. Also, no additional chemicals are used, while as much as 98 percent of the dye makes it to the fabric. The machine works in a closed loop, recycling 95 percent of the CO_2 — so the whole process is close to wasteless.

COLORIFIX

Dyeing

02



Colorifix

The science of sustainable colour

Colorifix is a biotechnology company based at Norwich Research Park developing a sustainable method of dyeing fabrics that could reduce the environmental impact of the fashion industry.

The company uses synthetic biology to engineer micro-organisms so that they can produce, deposit and fix dyes directly onto textiles. It is a sustainable dyeing process that reduces water and energy consumption, while completely removing the use of petro and toxic chemicals.

They already work with the brand Pangaia and they can dye polyester, nylon and cotton. They can also apply it throughout different stages of production from yarn to fabric to garment.

AIR-INK®

Dyeing

03

AIR-INK®

Water-based black ink

AIR-INK is a carbon-capture technology that captures air pollution particles and diverts harmful substances from the air we breathe.

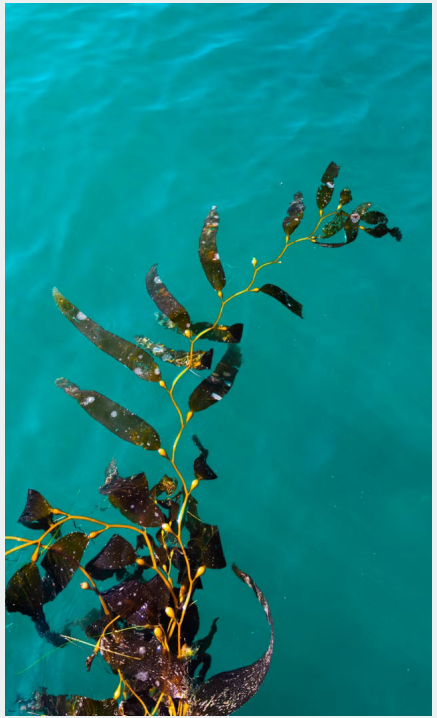
The particles are turned into different grades of inks, dispersions and coatings.

Here, the captured air particles are turned into safe, water-based inks.

ALGIKNIT

Yarns

04



AlgiKnit

Sustainable fibre from kelp

Algiknit is an American lab based in New York. They develop sustainable yarns from kelp, an organism that grows very fast and regenerates itself efficiently.

The yarns are easily renewable, recyclable and biodegradable. Today Algiknit are able to produce a continuous filament with high performances like silk.

Still, they didn't scale up yet so they don't have the capacity to produce big quantities. But their material seems very convincing and deserves to be followed closely.

ATKO LEATHER YARN

Yarns

05

ATKO LEATHER

ERLY ® (Eco Recycled Leather Yarn)

Atko Planning is a Korean factory that produces recycled spun yarns made from leather offcuts. Yarns are made through a process that doesn't use water nor toxic substances, resulting in various colors, structures, and shapes.

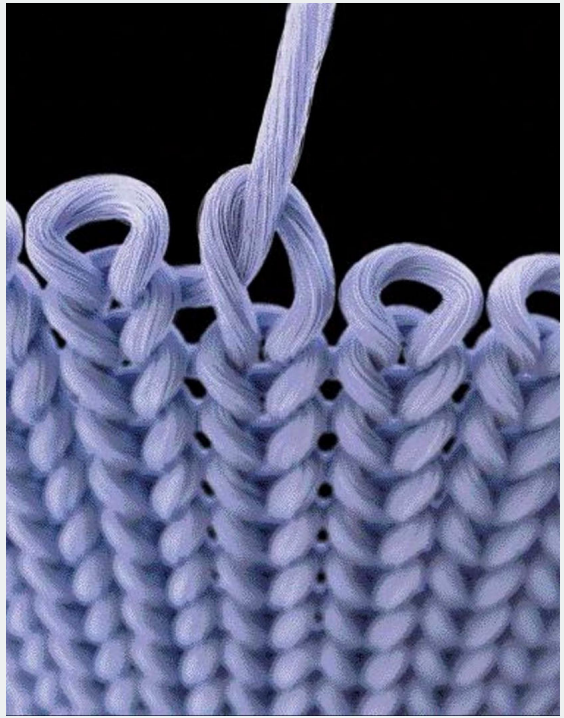
The leather scraps are collected from the proven leather tennery and applied to the production according to the strict quality standard. It can be applied in various fields such as clothes, leather goods, shoes, car interiors...

They also delevop yarns according to the needs and demands of their clients.

3D-TEX

Knit

06



3D Knitting Lab

3D Tex is a French knitting lab that produce knitted clothes from 3D files.

Their expertise consists in converting 2D pattern into a 3D modelisation of the garment adapted to their knitting machines.

Then, the garment is knitted in one piece and doesn't need any cut and sew step. The process doesn't generate any offcut.

They propose a selection of locally and eco-responsible sourced materials.

We have more Innovations that could be of interest

Book a Dedicated Pre-Audit to overview how we can accompany you in detail:

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