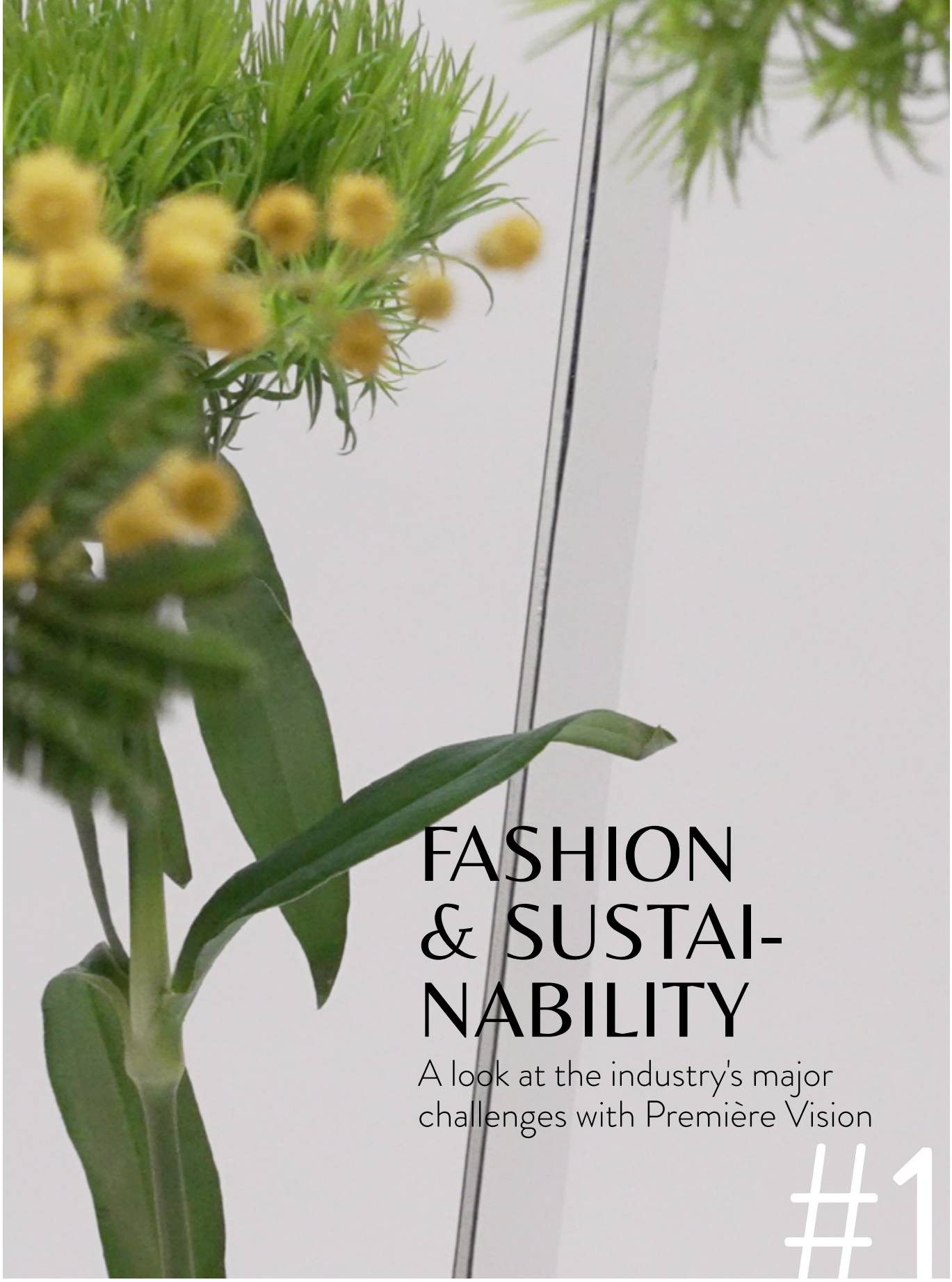

FASHION & SUSTAI-NABILITY

A look at the industry's major challenges with Première Vision

#1

PREMIÈREVISION

the art & heart of fashion

INTRO-DUCTION

In the face of today's pressing climate challenges, the fashion industry is both committed and innovative, inventing and re-inventing itself to reduce its environmental imprint through manufacturing methods incorporating circularity and sustainability.

In recent years, the awareness and commitment of the industry's key players, together with a change in consumer habits, have led to the implementation of concrete solutions to foster more ethical and responsible fashion.

In this first part of its FASHION & SUSTAINABILITY white paper, Première Vision presents an overview of some of the industry's major concerns - recycling, bio-sourcing, traceability and biodegradability - to move forward together towards a cleaner future.

Getting informed thanks to Smart Creation

Ever since 2015, Première Vision has been promoting the industry's sustainable approaches through its Smart Creation initiative. Its rich and complementary content analyzes the sector's major challenges and spotlights new values combining **creativity, innovation and sustainability**.

- **The Smart Keys**: a series of helpful, actionable articles to decode key eco-sustainability topics, and move towards more enlightened sourcing.
- **Smart Creation, the podcast**: a monthly exploration of the potential of sustainable fashion with guest experts sharing new ideas.
- **Smart Talks**: each season, a series of engaged conversations around the challenges of eco-responsibility, and the solutions and innovations put forth by textile professionals.

MANI-FESTO

In the effort to balance pragmatism and frivolity, how do we reconcile sustainability and attractiveness?

Fashion is well on the road to change, and seeks a coexistence between strong design statements and social/environmental considerations, throughout a product's life cycle.

The benefits of virtuous design include:

- Respect for **decent working conditions**, in accordance with human rights, guaranteeing safety, health and a basic living wage.
- **Traceable** and transparent production operations throughout the sector.
- The selection of **organic and recycled raw materials** respecting biodiversity concerns and animal welfare.
- **Compositions that promote circularity**, by opting for single-material products or recyclable blends.
- **Transformation processes favoring the reduction**:
  - of water consumption, and treating wastewater using innovative technologies
  - of energy consumption, with the use of solutions emitting less CO2
  - of chemical substances, from the first inputs to the finished product
  - of waste, and improving waste management.
- **Finishes and dyes** that favor mechanical processes or are inspired by the intelligence of nature for biomimetic innovations.
- The **guarantee of durability** thanks to qualities tested for their tensile strength and resistance to pilling and abrasion.
- Anticipating a **product's post-use environmental fate** as of its creation, including the possibility to reuse, repair, **recycle, or upcycle.**
- A concrete and global **measurement of environmental impacts**.

As the fashion landscape continues to move into a hybrid world, respecting human and natural resources is a key cornerstone, and calls for a dialogue between the physical and virtual worlds in order to build a sustainable and desirable future.

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FASHION & SUSTAINABILITY #1

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TRACEA-BILITY

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TRACEABILITY

1. SMART KEYS
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What are the issues around traceability?

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1 SMART KEYS Traceability

In theory, knowing where and how a textile, leather or accessories component is made is a great idea. But the reality is quite different. Often, **many of the processing stages and players in the value chain are scattered around the world**, making traceability the Holy Grail of our time.

Explore the other chapters

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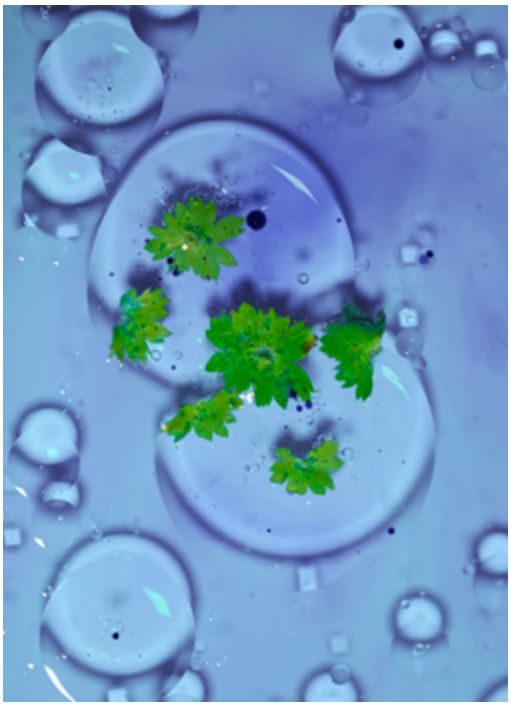
Transparency & traceability

Move from opacity to transparency! This is not a fashion theme but **a change in the way the industry works.** While traceability is compulsory in food supply chains, it is not so for textiles, leathers or components. Legally, only the composition percentages have to be displayed.



Although legislation, particularly in Europe with the due care requirement, encourages companies to find out more about the origins of their materials and show the conditions under which they are made, **traceability remains a voluntary action, and is currently unregulated.**

With consumers increasingly requesting more information about where and how their clothes and accessories were made, and wanting more detail than simply the "made in" country of manufacture, **there needs to be a shift towards greater transparency**, to encourage visibility along the entire value chain and increase trust.

Traceability is still challenged by a lack of transparency in the industry and the complexity of actually gathering the information. Without tools specifically for that purpose, retracing the chain of development is a complicated task. The many intermediaries and the multiple stages in development complexify data collection. There is also still the heritage of an opaque system that is reluctant to share information and expose how it works.

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An asset for social and environmental responsibility

Traceability is a very powerful tool for allowing companies to make progress in issues of social and environmental responsibility and prove the sustainability of their products by **sharing the product's backstory.**

Traceability transmits **data about the various components** of a product, as well as information **all along the value chain**. It ensures the **accuracy of information** such as quality, compliance with regulatory standards and the respect of social and environmental best practices.

In particular, it helps labels and participants in the supply chain to know when and to whom orders are outsourced or subcontracted, and can be used to monitor the movement of orders across the various geographical regions.

The implementation of a traceability system allows industrial partners **to have access to complete and reliable data**. Once the data has been gathered, transparency means giving all stakeholders access to the necessary and relevant information in order to make considered decisions.

It is in the interests of all companies to put in place a traceability system in order to meet their CSR objectives, reducing risks by examining and identifying potential problems, securing supplies and concentrating on improving practices.

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How can a material be traced?

Different systems can be used to demonstrate the traceability of a product:

Segregation, the most reliable system, means that certified materials and products are physically separated from non-certified materials, during all the processing stages. In this way it can be guaranteed that no mixing of certified and uncertified products has occurred. This is how GOTS operates, for example, requiring separate chains of processing for any products seeking certification.

A mass balance, where certified and uncertified resources can be mixed. This system guarantees the volume of certified material entering the value chain, however the specific proportion of certified material in the final product is generally not supplied. This is used for complex supply chains or when the quantities are low and do not allow for the segregation of materials.

BCI cotton uses this system, with segregation occurring until the cotton is balled and the mass balance principle applied from when it is spun into yarn. It tends to be used less and less as **it involves more risks**. When there is a blend of materials, the conventional material does not have to be traced, and could therefore be produced under dubious agricultural conditions or using forced labour.

Traceability is evolving and requires **investments in technology and processes** that seek to follow products along their development, however complex the supply chain. **RFID chips** and **QR codes** were some of the first tools to be developed and are still very useful for sharing information. But they are quite easy to duplicate or falsify.

So what are the tools and keys for the creation of a reliable supply chain?

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SMART KEY #1
Simplify supplies

Rationalising the number of components creates a healthier and simpler base for developing traceability. Many labels these days are decreasing their ranges, simplifying the materials used, in order to **concentrate on better overall management of their value chains.**

Encouraging vertically-integrated suppliers, and limiting the number of partners and intermediaries will make traceability easier. **Less and better, in short.**

SMART KEY #2
Back to the source

Today, solutions are being developed to establish a supply network that is traceable from end to end, from the cotton field or the sheep to the shopfloor. This is the approach of *The Sourcery*, a platform seeking to ensure traceability from farmer to consumer.

A way of working together more closely, consolidating verifiable investments, which then guarantees decent agricultural practices and working conditions.

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SMART KEY #3

Tracing to the heart of the material

Two tools are currently very popular: blockchain and markers at the heart of the material.

Like a true digital passport, blockchain is a centralised and secure digital register, presented as being impossible to falsify, which allows information to be collected and combined as the product develops.

Crystalchain, *Trustrace*, *Textile Genesis*™ and others accompany a number of labels, suppliers and players in their efforts to authenticate operations.

A more niche technique which is currently booming, the **biomarkers** from Haelixa, the **molecular markers** from Applied DNA Science and the luminescent nanoparticles from FiberTrace® allow **tracers to be placed inside the fibre that will resist the various treatments and stages in the manufacturing process**. Thanks to spectrometry scanners or laboratory testing, they can reveal the information stored through this item stored inside the material.

A real asset for the **leather** industry is **laser marking**, which places a code on the surface of the material without altering it, allowing the skin to be traced from the abattoir and throughout the tanning and finishing processes.

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2 FOCUS : What are the issues around traceability?

Traceability is one of the fundamental concepts of quality management, ISO 9000, and the objective is to establish **the background, application, location and origin of a material along the entire supply chain.**

It is a pillar of **social and environmental responsibility**, in order to be able to transparently communicate clear and consolidated data.

It covers **all the stages of the value chain, from the raw material to the final finishes**, and accompanies compliance with regulatory standards, and the respect of good environmental and social practices.

It also means that data on certain raw materials should be circulated and shared with related industries, such as with supplies from the agri-food industry.

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There are many **solutions and innovative tools** available to follow and authenticate data, such as **DNA markers** like Haelixa, **nanoparticles** added to fibres or laser markings on skins. **Laser marking** can support the identification and traceability of skins.

Gathering and securing data can be reinforced with the use of **blockchain**, an unfalsifiable register creating a digital replica of products.

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PV PARIS CONFERENCE
Innovation Pitch: Truly improving on sustainability with forensic science

How can forensic science support real time decision making with real time data?

If you want to do the right thing when it comes to your **sourcing decisions**, you need accurate traceability data. For the consumer, there's often not much difference between those that say and those that do. Forensic traceability is set to change that and **Oritain** is helping brands prove they walk the walk.

Conference presented by
Michela Mossali, *Business Development Manager at Oritain*

Conference recorded during Première Vision Paris, in February 2022

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BIO-DEGRA-DABILITY

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1 SMART KEYS Biodegradability

It only takes a scroll through the websites of fashion labels or a scan of materials collections to see that one characteristic is increasingly mentioned: biodegradability. An important response to concerns about the mountain of waste generated by fashion, but what it is the current state of play?

In general, the accent is placed on materials that are more solid and longer-lasting, so how can this be combined with the capacity to disappear swiftly into the environment?

Clearly, biodegradable materials will not disintegrate in a few months inside a wardrobe. This capacity requires specific conditions that vary according to the material. All materials end up by biodegrading eventually, but **some take six months while others take 200 years**, meaning the spectrum is vast.

Natural textiles – obviously biodegradable?

Natural plant-based raw materials such as cotton, linen, hemp and silk, or **animal** products such as wool and hide, are known for having an intrinsic ability to biodegrade rapidly.

In the case of a finished textile or leather, however, the conclusion can be very different, and this is the first aspect to pay attention to when sourcing.

Treatments, coatings, membranes and added decorations can hinder biodegradability. Similarly, certain dyes may contain harmful components and release toxic emissions into the environment once the material has disintegrated. Therefore, **the biodegradability must be guaranteed for the finished materials**, and not only highlighted as a property of the raw fibre.

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Biodegradable synthetics – a miracle solution?

This is of major importance, given that a synthetic material can take hundreds of years to disappear.

The tests and solutions developed since the 1980s were not very convincing. Materials become fragmentable but then persist for a long time as particles in the environment. **But technologies have developed and it is now possible to develop materials that are completely biodegradable.**

> So, how can biodegradable materials be best used?

Biodegradable and bio-sourced are false friends

Among the innovations seen in recent years, bio-sourced synthetics, polymerised from biomass such as corn, sugar cane or ricin are very popular.

Beware of amalgams

A synthetic product made from biopolymers, renewable natural resources, is not automatically biodegradable. Its components and its capacity for decomposition are two very different subjects.

Bio-sourced synthetics can have the same structures (PET, PA...) as their fossil fuel equivalents. So, while they reduce the use of fossil resources, their biodegradability needs to be verified.

Three factors for attention

A number of elements enter into play for a material to be biodegradable:

- **The environment** – Various parameters matter, such as the milieu (soil, sea water, fresh water), level of oxygen, pH, temperature, humidity and the micro-organisms activating the process.
- **The structure and the properties of the material** – The raw material, its construction and the various treatments it has received.
- **The degree of decomposition and the time needed** to obtain this disintegration. In order to be described as biodegradable, the standards require a minimum of 90% disintegration of the product within six months.

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SMART KEY #1

Develop products entirely made from biodegradable components.

In any effort to ensure the circularity of resources, the prerequisite is to design the garment or accessory with its end-of-life in mind from the outset.

A biodegradable textile or leather has obvious qualities. However, to facilitate the processing of the entire garment, its component zips, buttons, decorations and labels should biodegrade as well.

The challenge of dismantling products to extract the reusable materials has already been addressed in the recycling sector, but it would be best to tackle this issue at the root in order to avoid these problems, when we wish to develop biodegradable clothing and accessories.

SMART KEY #2

Have the item tested and certified

A material is considered biodegradable when it can break down under the action of living organisms, without causing harm to the environment.

It is a three-stage process:

- **Fragmentation,** where the material will transform into particles until it disintegrates.
- **Degradation**, the final stage of fragmentation, where the molecular mass is reduced.
- **Assimilation and mineralisation**, stages where micro-organisms integrate the residues of degradation to transform them into biomass, water and carbon.

Specific certification tests, such as OK Biodegradable Marine/Soil/Water, will analyse these stages, verify the time and the degree of biodegradability of the product, its non-toxicity and the absence of heavy metals.

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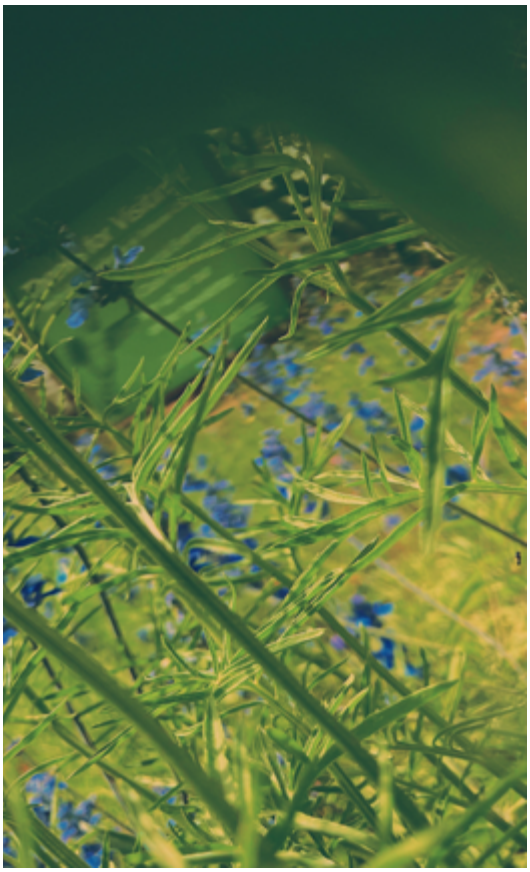
SMART KEY #3
Don't over-produce

Once again, common sense reminds us that a solution is only viable if it does not generate a negative countereffect. Over-production of materials, even biodegradable ones, also means having to then process an overabundance of them at the end of their life cycle.

Most biodegradable synthetics, at the moment, are only able to decompose under specific accelerated transformation atmospheres and also require the creation of sectors to collect and process the products.

In France, to avoid generating confusion and the belief that a biodegradable product can be abandoned anywhere outdoors, this term will be banned from finished goods from January 2022.

While the promise of these technologies is significant, they only provide a solution to facilitating waste processing and do not miraculously reduce the volume of pollution generated by the fashion industry. **Biodegradability will be a tool for ensuring the non-toxicity and reduced impact of a product, but should not be an objective in its own right.**



SOURCES:

- *Revue des normes sur la biodégradabilité des plastiques, Ademe, 2020*
- *Pollution plastique – une bombe à retardement, Rapport au nom de l'office parlementaire d'évaluation des choix scientifiques et technologiques, Philippe Bollo et Angèle Préville, 2020*
- *Fiche technique, les polymères biodégradables – Pôle Écoconception*
- *Article 13 loi AGEC*

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What are the characteristics of a biodegradable material?

A material is considered biodegradable when it can break down under the action of living organisms, without causing harm to the environment.
This concept is set out in **specific standardised criteria, where time required and the degree of biodegradability of the product, its non-toxicity and the absence of heavy metals are verified.**

Natural plant or animal fibres are biodegradable; however, a material must be tested after development and after it has received all treatments in order to bear this label.
Certain substances used during the various stages of the production process can alter these characteristics. **A biodegradable fibre will not automatically produce a biodegradable material that has no impact on the environment**.
Synthetic materials, known for taking hundreds of years to disappear, can be optimised during the design phase to improve their biodegradability.
Increasingly, synthetics are using the "bio-sourced", "bio-polymer" or "bio-plastic.
However, it should be noted that **bio-sourced materials are not automatically biodegradable**. Having a polymer synthetised from a natural resource does not automatically mean the resulting material will biodegrade.
Innovations making such **claims have to be tested and certified**.

A skin is naturally biodegradable. A leather, which is a skin rendered rot-proof by various treatments, is not necessarily so. Its end-of-life characteristics have to be tested, in order to confirm the harmlessness of its decomposition.

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An interview with **Christine Goulay,**
Global Director, Pangaia.

Working both on direct to consumer and B2B markets, the company is mainly focused on technologies and innovation. They design products made of bio-sourced and organic materials that can also be biodegradable.

> *The point is to bring those exciting low impact technologies to the market and serve as a proofpoint that we can make this transition.*

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RECY-CLING

RECYCLING

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- Is polyester recycling a sustainable solution?

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1 SMART KEYS
Recycling – can the fashion sector become self-sufficient in resources?

Often brandished as an illustration of eco-responsibility, from baby steps to an over-frequent phenomenon, it has only taken a few years for recycling to blossom in the fashion world.

Alternately loved and decried, is recycling the solution to a virtuous collection?

As a sector under intense scrutiny for its excessive use of natural and fossil resources, fashion has found a counter to this concern with the boom in recycled materials.

Promoting a new, non-linear production system, associating recycling with circularity has become commonplace. However, **the golden rules of the circular economy are the 5Rs: Refuse, Reduce, Reuse, Recycle, Return to the earth**. Recycling is therefore just one stage in a circular approach and not enough on its own.

A long-standing technique for wool but more innovative for other fibres, the range of recycled materials is now rich and diverse, with all types of fibre available in a recycled version, whether of natural, animal, synthetic or artificial origin.

Recycled materials are characterised by a number of parameters:

The source

These are resources used instead of raw primary materials, coming from **closed circuit recycling**, from within the fashion sector:

- **Pre-consumer** textiles or leathers, from the industrial phase (fibre production/spinning/weaving/knitting/offcuts) or unsold finished products.
- **Post-consumer** textiles or leathers, where old clothes are collected for reuse.

Or open-circuit recycling, where the resources come from another sector:

- **Waste from plastic production,** PET bottles, fishing nets
- **Vegetable by-products** from the agri-food or cosmetic industries

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The technology

They do not have the same advantages or limits:

MECHANICAL RECYCLING

This is **currently the most widespread** technique. It can be used to produce recycled wool and cotton, as well as the vast majority of recycled synthetics.

It produces materials with a reduced environmental impact, but the fibre obtained by these methods is generally of lower quality and has to be blended with a virgin fibre to compensate.

As the processed material is not perfectly light in colour, the possibilities for dyeing are also limited.

CHEMICAL RECYCLING

Like all technologies, it **depends on the way it is used**. It is important to analyse the **energy required** for the process and the CO2 emissions generated to **demonstrate a reduced carbon footprint** compared to a virgin material.

This technology can require **high levels of heat, pressure and chemical solvents**, so it is important to demonstrate that there is **not a negative impact** on water, air and the environment.

The specifications relating to chemical substances, such as those of **Oeko-tex Passport, Bluesign or ZDHC** (Zero Discharge of Hazardeous Chemicals) can accompany these developments.

The major advantage of chemical recycling, particularly for synthetic materials, is to **recreate** the native structure of the polymer, the **monomer**. This purified version can be used to recreate a fibre that has **identical properties to the virgin fibre**, thus offering the **promise** of a material that can be **recycled endlessly**.

It can also allow **cottons** and cellulosic materials to be **recycled** into **new artificial materials**.

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How they are used

There are a number of outlets, depending on the resource and the techniques used:

- **Cottons and wools** are frequently found in collections after having been **mechanically recycled**. They are sorted by colour and type of fibre, processed to remove impurities and shredded in order to be re-spun.

- **Cottons and vegetal residues** can be **chemically recycled** and thus produce **new cellulosic materials**.

- The vast majority of **recycled synthetics** come from PET bottles or fishing nets, mostly produced using **mechanical recycling**.

- **Recycled leathers** are mainly produced from **pre-consumer resources**, tanning or manufacturing offcuts, which are mechanically processed into reconstituted leather, **made up of recycled leather fibres and binding agents** in polyurethane or latex, or from recycled leather fibres set at the surface of a synthetic material.

The certifications

To assist in the identification of recycled materials, there are two widely-used certifications:

- **RCS** – *Recycled Claim Standard* only verifies the recycled content, and sets a **minimum level of 5% of recycled resources** in a material.

- **GRS** – *Global Recycled Standard* has more rigorous criteria with a **minimum of 20% recycled material**, extending this to 50% in order to communicate to consumers that a product is GRS certified.

This certification also covers **additional requirements for chemical inputs and social and environmental aspects**.

To avoid getting caught up in an approach that could be described as greenwashing, what needs to be respected in order to demonstrate a commitment to recycling?

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SMART KEY #1
Be transparent

Recycled or recyclable? This often causes confusion.

A **recyclable** material has the **potential** to be recycled. However, although in theory many materials could be recycled, in practice, it is not always possible. It involves being able to **create specific collection and processing networks**, collecting recyclable materials in **sufficient volumes** to be able to launch an **industrial production** process and also **scale up certain niche technologies**.

The recycled nature of a material does not eliminate certain problems; **notably the question of microfibres remains, whether the resource is virgin or recycled**.

Beware as well of the myth of recycled synthetics as an apparently ideal response to the problem of plastics. Today, they still require some **virgin hydrocarbon resources** in order to ensure a good quality fibre. Consequently, **if consumption of synthetic materials continues to increase at the same pace, the use of accompanying fossil fuel resources will remain substantial.**

Recycled synthetics could represent an **environmental advantage** if, in parallel, there is an effort to **reduce the overall use of synthetics**.

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SMART KEY #2

Design for recycling: what helps and what hinders

In order to ensure optimal recyclability, certain criteria are known to help or hinder recycling.

- **COMPOSITION**

  Mono-materials, and long initial fibres are real assets to ensuring a second life for a material.

  Elastane should not represent more than **2 – 5%** of a material.

  Work with **bi-material blends**, ideally of a similar typology (wool + cashmere, cotton + viscose, etc.) and **limit the second material to 15 – 20%**

  Do not use metallic fibres

- **MULTIPLE TEXTURES**

  It is recommended to avoid:

  Complex fabrics like jacquard

  Warp knits (which cannot be unravelled and therefore cannot be shredded),

  Fabrics with a **high degree of mechanical elasticity**

  Very thick materials or **very fine** threads

- **EMBELLISHMENTS AND DECORATIONS**

  Certain finishes such as **crease proof, flocking and coatings** can disrupt recycling.

  Bonded or sewn decorations are also problematic.

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SMART KEY #3
Textile-to-textile recycling

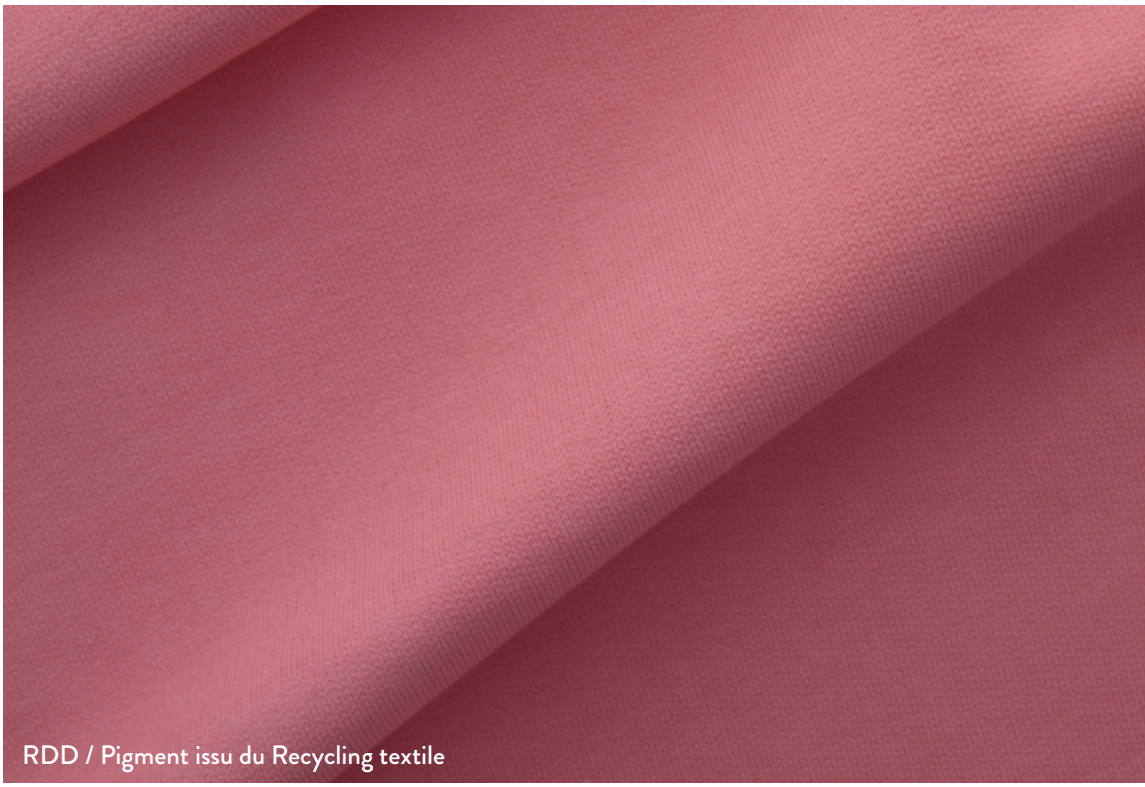
This is the cornerstone, which could create a step change and requires commitment and massive investment.

Only **1% of materials are recycled from textiles** into textiles and this is the heart of the matter: there needs to be an effective recycling structure within the fashion industry.

Cotton and polyester are the two most widely used fibres worldwide. Textile Exchange says that just **1% of cotton and 15% of polyester comes from recycling**, with **99% of recycled polyester coming from recycled PET bottles**.

While it is undeniable that reusing plastic bottles means less fossil fuel resources need to be extracted, it also generates sourcing battles between industries, as the agri-food industry, the main supplier, ends up competing with the textile industry. **The fashion industry must recycle what it sends to market,** and not draw on materials from other sectors.

While recycling is one aspect of the circular economy, a truly responsible garment should primarily be longer-lasting, thanks to its quality and its capacity to supersede fashion trends.



RDD / Pigment issu du Recycling textile

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1 SMART KEYS
Is polyester recycling a sustainable solution?

The overwhelming popularity of recycled polyester would suggest that it's a kind of miracle solution for fashion and the environment. And although it is a real solution, it's not as simple as all that, and it's certainly not a license to mass-produce new polyester for secondary recycling. The recycling process is itself energy-intensive, production channels continue to lack structure and the origin of the transformed material remains difficult to trace. We think it's important to add here that the energy performance of recycled polyester is still lower than that of natural materials and it is a good idea to remain wary, both in terms of its use and brand message.

The problematic omnipresence of PET

Polyethylene terephthalate, the scientific name for PET, is a plastic, and therefore made from petrochemicals. When it comes in the form of a textile fiber, PET is called polyester, and can be used to manufacture clothing. The majority of PET plastic produced is marketed as polyester [1].

It **is estimated that 60% of the virgin PET made across the globe is used to make clothing**. The use of polyester is widespread throughout the fashion industry, and over half of fashion products contain polyester, particularly sportswear, footwear and waterproof outerwear. Most people are well familiar with polyester's negative impact on the environment. Research conducted jointly in 2019 by the Institut Français de la Mode and Première Vision demonstrated that, in Western countries, consumers rank polyester at the top of the list of materials perceived as least eco-friendly, and are expecting brands to introduce change [1].

Several brands (H&M, Timberland, Nike, Esprit, Volcom), alongside the Textile Exchange association, had already committed in 2017 to using at least 25% recycled polyester by 2020 [2]. Using recycled material has an undeniable ecological interest – it takes 50% less energy to make, it avoids producing oceanic waste or landfill and the extraction of non-renewable resources. However, it's a bit dangerous to present recycled polyester as a miracle solution.

[1] Ref PV x IFM 2019 study
[2] textileexchange.org

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The limits of recycled polyester

To start, whether recycled or not, **polyester generates plastic microparticles during each wash, microparticles which** are released in the wastewater and then into the oceans. Secondly, polyester can't **be infinitely recycled** because recycling causes it to lose strength and quality. As of now, it is still quite complex to design a recycled polyester product without the addition of virgin material.

The recycling process is itself energy-intensive, due to the process of dismantling the components of a garment or a shoe, which is made even more complicated by the fact that there are numerous components (often several textiles or even blends, non-dissociable finishings), the use of chemicals for depolymerization, etc. Some companies, such as the TBS brand, are looking to bypass these issues, with for example ReSource, the first sneaker that can be shredded and recycled without requiring dismantling [4].

It's still impossible to trace the origin of recycled polyester. Our recycled polyester garments are mostly made from used packaging, and their origins are unknown. Citeo, the French organization in charge of organizing and developing packaging recycling, says 15 PET bottles must be recycled to make a polyester sweater [3]. **To ensure their production volumes in recycled polyester, brands thus require access to a large and stable pool of raw materials**. They must therefore necessarily use recycled PET from the selective sorting of private individuals. It is important to be wary of brands making assurances to the consumer of the "recycled from ocean waste" nature of a material or finished product.

On the consumer side, it is possible to refer to certain labels such as GRS (Global Recycle Standard), Œko Tex STeP and Bluesign, which guarantee that a given recycled polyester has been produced as cleanly as possible, limiting the presence of solvents and other chemicals in its manufacturing.

The various sub-sectors continue to fall short of ambitions, because structuring these recycling activities amounts to creating a second parallel industry. Raw material deposits are multi-site (pre-consumer as at Mud Jeans, and/or post-consumer as at Circle or Shak & Kaï), and the processes of material sorting, defibration, possible depolymerization and then polymerization into a textile fiber require a dedicated industrial park, assisted by substantial financing.

From a strictly environmental point of view, recycled polyester is more sustainable than virgin polyester, yet still less efficient than most natural materials. To date, it seems best to avoid it and, when it is necessary for a garment's technical performance, to unhesitatingly prefer recycled polyester, and inform consumers in a transparent way about its origins, the decision to choose the material and the best way to care for it in a sustainable way.

Article realized in partnership with The Good Goods, the first French-speaking platform dedicated to eco-responsible fashion

[3] Citéo
[4] Thegoodgoods

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2 FOCUS
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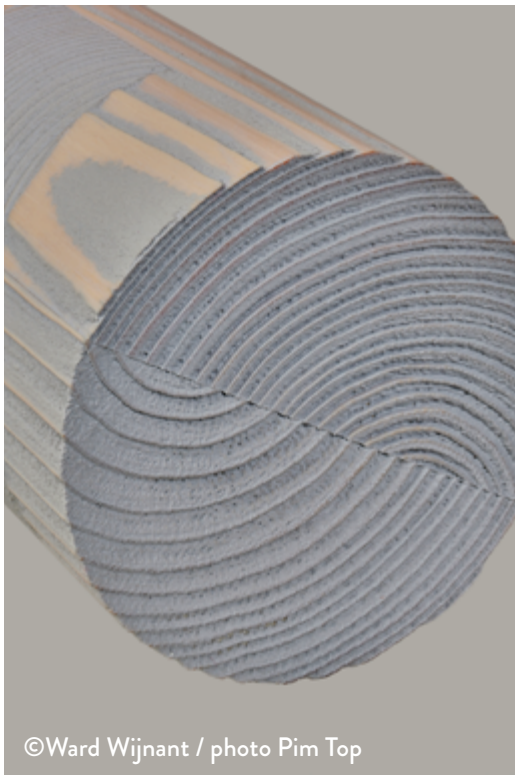
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They facilitate recycling, by taking the end of life of the product into consideration from its conception.

Compositions in 100% materials and components, optimising recyclability.

Available in cotton, hemp, polyester, polyamide from the main material to the functional and decorative components.

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Interview with **Mark Hartnell**
Director of Textiles, Seaqual™.

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Seaqual is about doing good within the blue economy.
Everything to do with the ocean
and the communities from the ocean:
How can we help them to become more sustainable?
How can we move towards circularity?
How can we create collaborations in communities
and provide solutions?

FASHION & SUSTAINABILITY #1

A look at the industry's major challenges with Première Vision

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SMART KEYS
Alternative plant-based materials

With the agri-food industry increasingly promoting its "farm to fork" approaches, the fashion sector seems to be following in its footsteps, with an approach that could be described as from "plate to closet," with so many innovative plant-based materials that would be typically found at the table.

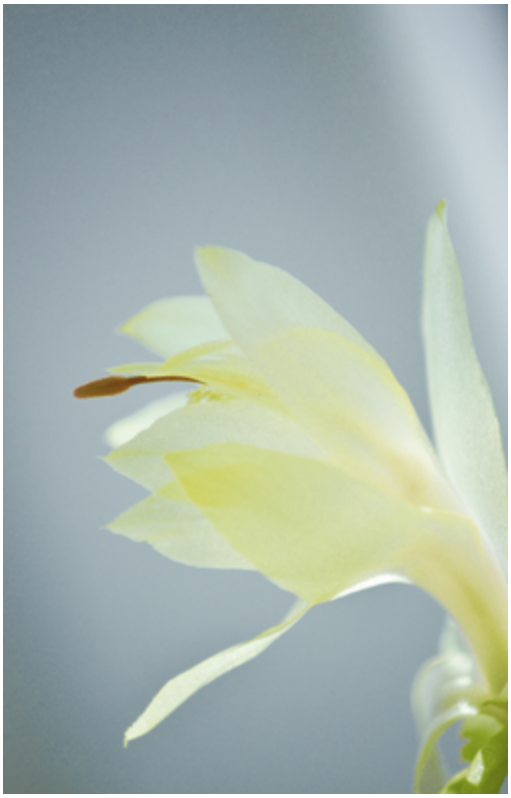
Vegetizing fashion

The last five years have seen an array of fruits and vegetables used to create emerging materials:

Banana fiber from the banana plant is a popular choice to enrich the range of natural materials, and is particularly resistant.

A standard-bearer for this new generation of materials, Ananas Anam extracts the fibers in the leaves of pineapples grown for consumption, transforming them into felt that is then covered with a coating partially made from corn. Ananas Anam not only produces the material, but also uses its production residues as fertilizer or biofuel, in order to optimize every last gram of biomass.

The range of possibilities is vast, as we are now seeing materials produced from kombucha or seaweed passing the pilot project stage.



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Natural composites

Mirum® combines agricultural waste such as **powdered cork, coconut fiber, soybean oil and latex rubber**. It contains no petrochemicals, nor synthetic binders or polyurethane coating. A clever combination of recycled agricultural by-products, this material from Natural Fiber Welding can be used for leather goods, footwear or the auto industry.

On the clothing side, **Agraloop™** is a fiber-processing technology that transforms hemp, linseed, and the stems and leaves of edible and medicinal plants into artificial fibers that combine softness and eco-quality.

Mid-way between synthetics and naturals

Some solutions offer an improved version of artificial leathers made from hydrocarbons, with an increase in bio-sourced content.

These materials have a textile, cotton or polyester base, that may or may not be recycled, covered with a bio-sourced polyurethane, produced from grape marc for **Vegea®**, apple residues for **Appleskin®**, recycled corn kernels from **Viridis®** or cactus leaves for **Desserto®**. A means of pursuing research into green chemistry, using agricultural waste instead of the typical petrochemical components.

So far, the formulas are not entirely bio-sourced and are still blended with fossil fuel resources, in order to obtain materials that meet the exacting standards of the clothing and accessories industry.

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Root material

The innovation that is currently capturing a lot of attention lies in the root network of mushrooms. The mycelium, a fibrous network derived from the substrate of a fungal culture, can take on the appearance of felt and has the advantage of being thermosettable, shock-resistance, breathable and water repellent.

Agricultural waste or cotton cellulose act as enzymatic catalyzers for these cultures, which develop a dense mat of interconnected cells. This transformation requires specific humidity and temperature levels in order to encourage the development of these fungal mosses.

The mycelium mat can then be stabilized through a **tanning process** or finished with a **coating produced from green chemistry**, then embossed to give a grain to the finished material.

They are not a miracle solution as these materials remain at the innovation stage for now, sowing the seeds for the materials of tomorrow.

Between promising laboratory research and pilot projects, there is a long way to go before these solutions become widely available. The fashion industry will have to be patient and develop alongside these innovative technologies.

> So how can we analyze the various solutions and identify the game-changing idea from the ecological damp squib?

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SMART KEY #1

Create an industrial symbiosis

Given that some agri-food products can generate up to 60% non-usable residue, **a number of solutions are already focusing on this unexplored biomass**. Some materials are already heading in the right direction, but the first requirement is to check the origin of the agricultural resources.

The possibility of creating new materials should not lead to another source of land-use pressure, with the conversion of land already dedicated to the agri-food industry, the use of GM crops or resorting to deforestation to grow plants that could be more profitable. In no way would this be a responsible operation, whether from an environmental or a social point of view.

Instead, industrial symbiosis is the name of the game, establishing collaborative networks between industries, encouraging **cooperation between the agri-food and materials research** sectors, with textile innovations being produced from **secondary raw materials**. These materials will form part of the circular economy, in order to optimize all resource use and thus reduce the ecological footprint.

SMART KEY #2

Question percentages and characteristics

To describe a material as **a responsible innovation**, it must demonstrate a major improvement over standard alternatives, notably with regard to **the percentage of biomass, the type of chemical processing** (addition of solvents, plasticizers, etc.) **or mechanical processing** involved in its development, its **breathability, water-repellent properties**, and more.

Plant-based materials can often promote their biodegradability, but while this may be true of the raw material, can the same be said of the finished material? If it is truly biodegradable, then what conditions are required to achieve this?

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SMART KEY #3

Test resistance and durability

Often recommended to replace leather or artificial leather, these materials must primarily be chosen for their characteristics, properties or look, being selected deliberately and carefully and not by default!

Their robustness must be examined.

Physical and mechanical tests will **establish the performance and durability of the material** in question, with regards to its production, processing and use, by testing its tensile strength, flexibility and rub-resistance. This is in order to produce footwear or leather goods that do not repeat the cracking and wearing out that was seen in earlier generations of polyurethane or PVC products.

"About Grid" ©Netta Getta / photo Roni Cnaani

SOURCES

- Comparison of the Technical Performance of Leather, Artificial Leather, and Trendy Alternatives – Michael Meyer *, Sascha Dietrich, Haiko Schulz and Anke Mondschein

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2 FOCUS
How can we rethink waste?

Piñatex By Ananas Anam

By adopting a circular approach to raw materials, with the repurposing of agri-food and cosmetic residues.
Optimising resources to reduce the pressure on arable land and diversify sources.

Many options are available

- **Cupro®** made from cotton linter, the residue from the production of cotton oil, and now manufactured in a closed circuit, reusing water and the copper and ammonium solution used to produce the fibre.
- Artificial materials made from cellulose pulp extracted from citrus residues after the production of juice, or from hemp residues.
- Fibres with greater strength, from banana leaves and stems, or the leaves of food-grade pineapples.
- Papers produced from waste generated by the production of textiles from hemp or nettles.

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Food waste upcycling

The key materials of the Summer 2023 season stem from a veritable cornucopia. The appetite for novelty is here balanced by the exploration of **co-products from the agri-food industry**. Residuals of all kinds **nourish supply diversification** in the sector and intensify exploration of the science of materials.

Neo-materials from the agri-food industry

Cottons and wood cellulose, which are under pressure, are leaving the field open to newcomers to ensure maximum optimization of all resources extracted from the soil. Initially grown for food, bananas, pineapples, oranges or grapes will be analyzed down to their slightest characteristics in order to extract rich possibilities from their by-products.

Developed into **knitwear, silk or linings**, artificial neo-materials rely on **industrial symbiosis to let the flow of resources circulate**. Knowing that 1kg of fruit can generate up to 1.5kg of agricultural waste, we transition from an approach of extracting materials to an approach of valorizing the slightest fiber. A way of allowing **farmers** to create **additional income** with the resale of by-products while **reducing the pressure on the soil.**

Pangaia

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Fruits, hemp & marine leathers...

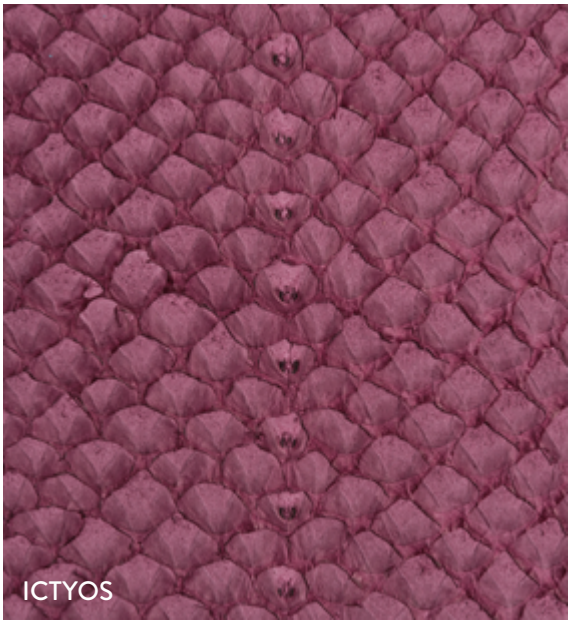
Frutfiber™ by **Pangaia** recovers and extracts **fibers** from **banana and pineapple** leaves that were originally left to decay or were burned after harvest. Mixed with **bamboo Lyocell**, these celluloses are produced in a closed circuit with reused water and solvents. To perfect the fabric, finishing is done with **Pprmint™**. Derived from steam-extracted peppermint oil, without solvents or chemicals, this antibacterial and anti-odor treatment lets the garment stay clean longer and spaces out washings.

Agraloop Biofibre™ also collects crop waste as a source of new fiber. This season, these innovative regenerated celluloses explore residues of hemp seed oil. Hemp adds **soil-regenerating qualities** (from the natural removal of heavy metals and chemical residues) to Circular Systems' virtuous technologies that **reuse treatment water** and give new life to **solid waste as fertilizer**.

Leather is not overlooked, with proposals that also recycle by-products from start to finish. Specialized in **marine leathers from the food industry, Ictyos** is pushing limits with its new **tanning solutions**. The Lyon-based company is using its know-how to develop vegetable tanning products **derived from grape mills or beer brewing residues**.

This approach is particularly effective since these extracts **act as both tannins and colorants** while providing salmon skins with unprecedented softness and suppleness.


ICTYOS


ICTYOS

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4 PV PARIS CONFERENCE
What about fashion circularity?

Starring the IFM (Institut Français de la Mode) documentary "Le Paris de la circularité" and two sustainable and innovative startups Bananatex and Spiber.

Presentation and conversation moderated by **Andrée-Anne Lemieux**, *Sustainability IFM-Kering chair Director, IFM*, joined by:

Kenji Higashi
Head of Business Development and Sustainability, Spiber Inc.

Hannes Schoenegger
Co-Founder / CEO Bananatex

Conference recorded during Première Vision Paris, in February 2022

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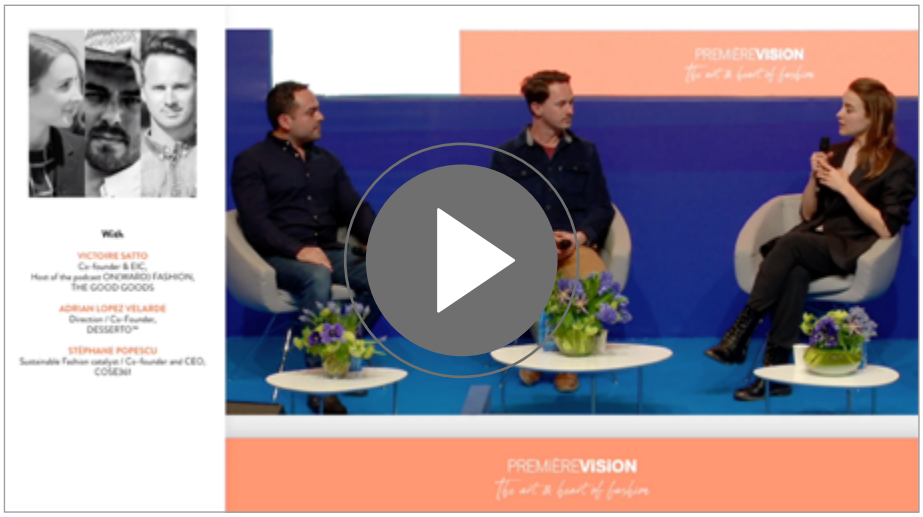
Biosourcing era: how scalable and sustainable are the tutti frutti options?

The emergence of new fibers contributing to CO2 capture : an inventory of the real ecological performance and sustainability of textile materials derived from biomass.

A talk moderated by **Victoire Satto**, *Co-founder of The Good Goods and host of the ON(WARD) FASHION podcast*, joined by expert guests:

Adrian Lopez Velarde,
Direction / Co-Founder of DESSERTO™

Stéphane Popescu,
Sustainable Fashion catalyst / Co-founder and CEO of COSE361



Conference recorded during Première Vision Paris, in February 2022

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1 SMART KEYS International sustainability labels to know

While it's gratifying to witness the steady growth of ethical fashions – in other words fashion concerned by its environmental impact and the well-being of the workers in its value chain – it's also growing increasingly difficult to tell the difference between a meaningful commitment and greenwashing. That's why sustainability labels and certifications validated by independent third-party organizations are so important today. There are a number of them, each attesting to various commitments in terms of a textile, a product, a factory or even a brand. Here are a few international environmental labels we believe are important to know.

What is a label?

A label is a protected, distinctive and collective trademark created by a public or semi-public body, an association or a professional organization. It is affixed to a product to guarantee its origin, specificities, level of quality or conformity to pre-established production standards, in order to distinguish it from competing products. It can be used by producers or brands that comply with the specifications drawn up by the body or agency holding the label.

Why obtain a sustainability label?

There are several advantages to obtaining a sustainability label: on the one hand, a label is a standardized and international communication tool that allows you to communicate your company's commitments to consumers in a tangible way backed by third-party validation. On the other hand, the labeling process, generally updated every two years, is based on an audit that provides recommendations for best practices with a view to continuously improving production methods. To date, no entity is required to certify its materials, finished products, brand or factories. It is a voluntary process that depends on your desire to demonstrate your commitments, your budget and your activity sector.

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Environmental labels to know

Please note: no label is exhaustive and criteria often intersect. This classification takes into account the leading environmental parameters.

Global Organic Textile Standard (GOTS)

GOTS is a global standard for textile fibers from organic supply chains. It sets forth environmental requirements and social criteria, and is based on independent certification of the entire supply chain. The standard covers the processing, manufacturing, packaging, labeling, trading and distribution of all textiles containing a minimum of 70% certified organic natural fibers. Currently, this label has the most demanding specifications. Two main auditors – Ecocert and Control Union – deliver the certification.

Œko-Tex

Œko-Tex is an international label that ensures the innocuousness of raw materials, processed textiles and finished products (clothing, accessories, household linens) for both people (workers and consumers) and the environment. Labeled articles are deemed free of harmful toxic substances. It was created by an independent German association, and is also called 'Confiance Textile' in France. There are seven different Œko-Tex certifications, which concern various sectors and levels of impact in the textile industry. The "Standard 100" label is the most common.

Bluesign

Bluesign is an international certification for textile manufacturers whose production process is considered safe for people and the environment. It takes into account environmental criteria, such as the reasoned management of water and the toxicity of dyes, and social criteria such as the safety of workers and consumers. Bluesign aims to connect everyone involved in the chain – chemical suppliers, textile manufacturers and brands – to promote a healthy, responsible and profitable textile industry.

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Organic Content Standard (OCS)

OCS is an international label initially developed to certify the organic nature of a cotton crop. It was later broadened to include other textiles. It guarantees strict traceability from the production of the raw material to the finished product and can be applied to any type of non-food product.

Global Recycle Standard

GRS is an international standard that assesses recycled content and restricts the chemical composition of a finished product, whilst also monitoring the social and environmental practices of the production chain involved in its transformation. GRS-labelled products contain a minimum of 50% recycled content.

Forest Stewardship Council (FSC)

FSC is an international non-profit organization that certifies forests, supply chains, retailers and finished wood and wood pulp products (hardwoods, eucalyptus, bamboo, etc.). These trees are from sustainably managed forests. In fashion, this can apply to so-called cellulosic or regenerated materials (such as viscose, rayon, lyocell/Tencel, modal) or cardboard packaging. There are 3 types of FSC labels:

- FSC 100%, the material comes entirely from FSC-certified forests.
- FSC Recycled, the material comes from recycled materials originating from FSC forests.
- FSC Mix, the material comes from FSC-certified forests and recycled materials.

Regenerative Organic Certified (ROC)

The Regenerative Organic Certified (ROC) certification was created in 2017 by a consortium of business leaders and farmers, one of whose founding members is the Patagonia brand. ROC covers fibers from regenerative agriculture. It is the most demanding organic standard, ensuring soil rehabilitation, animal protection, the improvement of farm workers' lives, fair working conditions and the opportunity to improve farm workers' socio-economic status.

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Ecocert

Ecocert is both an international certification and a certifying body for many labels (including GOTS, OCS, Ecocert Standard). The label covers textile raw materials, household products, cosmetics and certain food products.

Article realized in partnership with The Good Goods, the first French-speaking platform dedicated to eco-responsible fashion

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2 FOCUS
Responsible Wool Standard (RWS)


Incalpaca (PE)

What are the characteristics of RWS?

RWS, Responsible Wool Standard, est une norme volontaire internationale attestant de la bientraitance animale dans les élevages de moutons, et d'une chaine de valeur responsable et traçable jusqu'au produit.
Elle a pour objectif d'identifier et promouvoir les bonnes pratiques des éleveurs, au travers du respect de l'animal tout au long de sa vie, et de la gestion raisonnée des terres, en veillant à la santé des sols et à la biodiversité. Elle encadre également les critères sociaux.

Le bien-être animal animal se définit autour des piliers des **5 libertés animales** :

- absence de faim, soif ou malnutrition
- absence d'inconfort
- absence de douleurs, blessures ou maladies
- liberté d'exprimer les comportements propre à leur espèce
- absence de peur, détresse, ou stress thermique

La pratique du mulesing est interdite.

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3 PV PARIS CONFERENCE
Innovation Pitch: The key points to know about sustainable textile certifications

The aim of this presentation is **to help companies to better know what are the main sustainable certifications available for the textile & fashion sector**, what are their main claims and criteria, how to select a certification and how to become certified.

Conference presented by
Vincent DURET, *Textile Business Unit Manager, Ecocert Greenlife.*

Conference recorded during Première Vision Paris, in February 2022

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Discussion with **Franziska Dormann,**
Global Organic Textile Standard -GOTS- Representative (Germany/Austria/Switzerland).

Now you can see that different partners and stakeholders of the industry are really interested in getting certified and getting the supply chain transparent on ecological as well as on a social criteria level.

CON-CLUSION

Following this overview of the key issues surrounding fashion's impact on the planet, Première Vision will offer keys to committed sourcing in a forthcoming instalment detailing innovations and concrete solutions, sector-by-sector.

In the meantime, keep up with all the latest sustainable news and trends by going to the sustainability section of Première Vision's online magazine.
And don't miss our coming events, to discover our exhibitors' latest eco-responsible materials and innovative manufacturing methods in the Smart Creation space.

DENIM PREMIÈRE VISION
17 & 18 May 2022
Berlin

PREMIÈRE VISION PARIS
5, 6, 7 July 2022
Paris Nord Villepinte

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FASHION & SUSTAINABILITY #1

A look at the industry's major challenges with Première Vision

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PERFORMANCE CODES

As everyone working in the sector is now committed to a more sustainable, more responsible and more ethical fashion industry, innovations in the field of eco-responsibility are continuing to progress and responses are multiplying making the virtuous circle a reality. Labels can now draw on a large range of solutions, meaning that precise and sometimes complex understanding is needed. In this context, Première Vision is ideally positioned as a key player able to provide information on the invisible, eco-responsible qualities of products, via breakdowns, conferences and curated selections. The performance codes developed by Première Vision for eco-responsibility provide simple and didactic information about all sectors, thus enabling environmentally-friendly sourcing that is adapted to your needs and criteria.

Organic material

Products with a composition of more than 50% organic natural material (cotton, wool, linen and silk, mainly). Organic materials follow the rules governing organic agriculture and are produced without the use of synthetic chemical products.

Bio-sourced polymers

A synthetic material obtained from at least 30% bio-sourced renewable resources (e.g., glucose, castor oil, sugar cane, apple or grape residues) to which various additives are added. Biopolymers can be used as an alternative to polymers derived from non-renewable fossil resources.

Recycled material

Material consisting of at least 30% recycled material, whether natural or synthetic (mainly cotton, wool, linen, silk, polyester, polyamide). It is becoming more widespread not only in fabrics but also in the production of accessories through the use of recycled plastics, textiles, metals and leather.

Low chemical impact finishing

Treatments, dyes, prints and finish that enable a reduction in the use of chemical products and ensure their harmlessness for people and the environment. Finishes with a reduced chemical impact cover a wide spectrum of sectors such as denim, leather and printing techniques.

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Waterless

Treatments, dyes, finishes that enable a reduction in or complete elimination of water consumption. The "waterless" property can be applied to one or all of the stages in the lifecycle of a product, from the plant to the finishing. It can refer to the use of fibers requiring little water such as certain bast fibers, particularly linen, but also the system for reusing wastewater during the product manufacturing.

Metal-free

Specific to leather, this is a tanning and/or finishing process that does not use heavy metals, instead employing synthetic agents, the formulation of which is specific to each tannery. It is recognized for its multi-purpose properties, adding strength and softness to the leather. It also has the advantage of enabling bright, luminous colors to be obtained, which is not possible using plant-based tannins.

Traceability

Identification of the history of the material along its entire production chain, from the source through to the transformation to the finished product. This property makes it possible to communicate transparently about certified information regarding a product.

Vegetable tanning

This is tanning done entirely using vegetable tannins. It is the ultimate in eco-responsible tanning. It gives the leather specific mechanical and chemical properties but limits the choice of possible colors and is notably more UV sensitive.

Biodegradable or compostable

This is a material that is biodegradable or compostable at the end of its life under specific environments and conditions. It can refer to natural materials, as certain fibers such as cotton, wool and silk naturally boast these properties along with other cellulosics such as Lyocell. It can also concern synthetic fibers such as polyester which generally takes hundreds of years to break down in nature.

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- Episode 2: Matteo Mantellassi, CEO at MANTECO
- Episode 3: Flavio Berto, CEO at Berto
- Episode 4: Michael Lam, Marketing Director at Advance Denim
- Episode 5: Nicolò Zumaglini, CEO at Lanificio Subalpino
- Episode 6: Andreas Andrén, Founder and CEO of We aRe SpinDye®
- Episode 7: Monique Maissan, Founder and President of Waste2Wear®
- Episode 8: Deborah Berger, Deputy General Manager, Nativa Precious Fiber
- Episode 9: Marina Coutelan, Fashion Manager for The Smart Creation Project at Première Vision
- Episode 10: Jeanine Ballone, Managing Director at Fashion 4 Development Solutions
- Episode 11: Isaac Nichelson, CEO & Co-founder at Circular Systems™
- Episode 12: Guido Zilli, Head of communication and sustainability at Gruppo Dani
- Episode 13: Marie-Demagdt, Textile & Sustainability Director at the CELC (European Confederation of Linen and Hemp)
- Episode 14: Francesco Marini, Designer and Innovation Manager at Marini Industrie SpA
- Episode 15: Ruth Farrell, Global Marketing Director at Eastman Naia™

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- Episode 17: Kutay Saritosun, Director of Fashion Brands at Bluesign Technologies
- Episode 18: Kevin Germanier, Founder of the brand Germanier
- Episode 19: Olivier Raynaud, Owner and General manager of Raynaud Jeune
- Episode 20: Kenji Higashi, Head of Business Development & Sustainability at Spiber Inc.
- Episode 21: Marie-Emmanuelle Demoures, Head of Product at Balzac Paris
- Episode 22: Célia Poncelin, Chief Marketing Officer at Heuritech
- Episode 23: Jonathan Cohen, Founder and Creative Director of his eponymous brand
- Episode 24: Nicole Lambert, Fiber & Materials Specialist for Textile Exchange
- Episode 25: Sandya Lang, Sustainability Manager at Nudie Jeans
- Episode 26: Mark Hartnell, Director of Textiles at Seaqual™
- Episode 27: Benjamin Malatrait, CEO & co-founder of ICTYOS, Cuir Marin de France
- Episode 28: Tony Tonnaer, CEO and founder of Kings of Indigo
- Episode 29: Andrée-Anne Lemieux, Head of Sustainability at Institut Français de la Mode (IFM)- Kering Research Chair
- Episode 30: Louis Epaulard, CEO and co-founder of Léon Flam (leather goods)
- Episode 31: Franziska Dormann, Global Organic Textile Standard -GOTS- Representative (Germany/Austria/Switzerland)
- Episode 32: Pasha Whitmire, Material Development Lead at Patagonia
- Episode 33: Guillaume Darrousez, CEO of Petit Bateau
- Episode 34: Rune Orloff, Co-founder of POOL
- Episode 35: Daniel Gayle, Founder and director of the menswear brand DenzilPatrick
- Episode 36: Pascal Monfort, Fondateur du cabinet de conseil Rec *(French only)*

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- Episode 38: Munir Ahmed, Director & Owner of M&J Group and Genesis Fashion Ltd
- Episode 39: Liisa Kelo, Value Chain Development Manager at FSC (Forest Stewardship Council)
- Episode 40: Christine Goulay, Global Director at Pangaia
- Episode 41: Livia Firth, Co-founder and Creative Director of Eco-Age
- Episode 42: Silvie Chailloux, Présidente UFIMH (Union Française des Industries de la Mode habillement) & GFF (Groupement de la Fabrication Française) et fondatrice-co-dirigeante TEXTILE DU MAINE *(French only)*

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- Towards ever more eco-responsible packaging
- Ecological and ethical accessories
- Ecological and ethical accessories
- Traceability
- Biodegradability
- Fashion and chemistry... a dangerous liaison?
- What's behind the seeming "naturalness" of cellulosic materials?
- A look inside the hidden face of cotton
- Is polyester recycling a sustainable solution?
- International sustainability labels to know
- Recycling – can the fashion sector become self-sufficient in resources?

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And the Première Vision teams

PREMIÈREVISION

the art & heart of fashion

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