



materials utopia

a virtual tour of materialscout's exhibition curated for the MCBW2020



There are no sustainable materials. It all depends on how one processes and uses materials to create products and spaces. This mini exhibition features materials and technologies that can help designers, product managers, engineers, to create more sustainable and circular products with the following material families:

- bio based
- bio composites
- post-consumer
- post-industry
- compostables

on the materials cards

click  for more info



bio based

Bio-based materials are typically created from agricultural scraps, for example: corn, sugarcane, wheat or food waste....

The term 'plant-based' refers to the source of the material itself, not how it will behave after it's been thrown away.

Here, a few examples of materials based on natural raw “ingredients” This is a small collection, there are many others out there - both under development or already on a commercial scale.

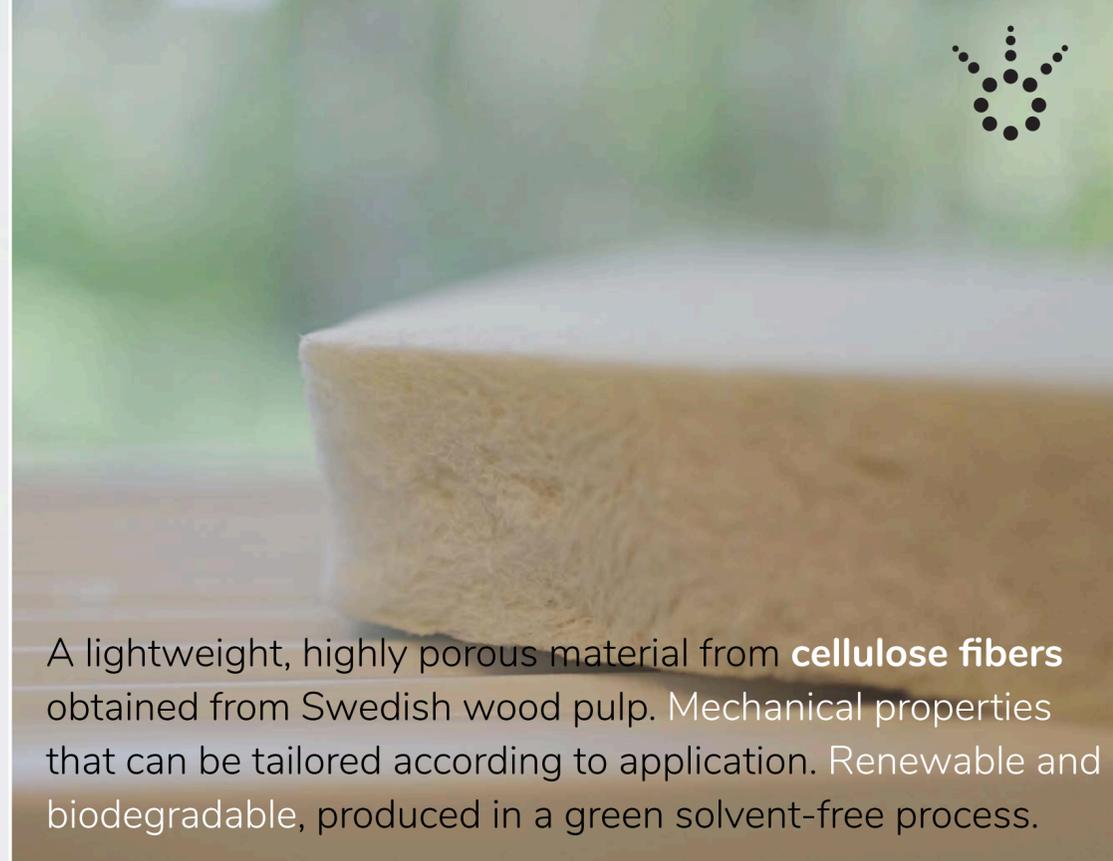
It's basically to open your appetite and show you alternatives to man-made materials.



An innovative natural textile made from **pineapple leaf fibre**. The leaves are the byproduct of existing agriculture, and their use creates an additional income stream for farming communities.



When the capillaries are injected with various bulking agents, **rattan** is transformed from a wood with limited use to a versatile, innovative material: Karuun



A lightweight, highly porous material from **cellulose fibers** obtained from Swedish wood pulp. Mechanical properties that can be tailored according to application. Renewable and biodegradable, produced in a green solvent-free process.



Water soluble and biodegradable thermoplastic pellets based on **milk protein**. Those pellets can be used as a raw material for thermoforming, films, or any kind of plastic applications.



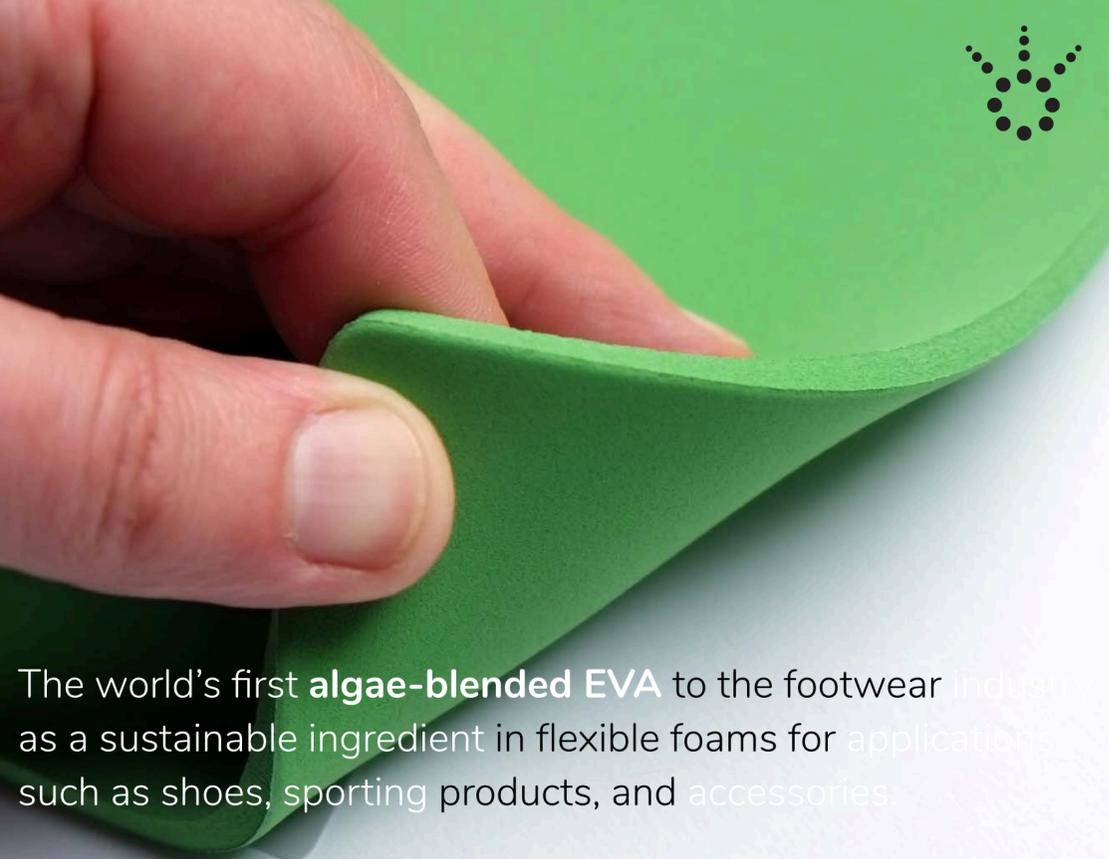
Producing highly fibrillated macro (MaFC) micro (MFC) and nano (NFC) cellulose fibres, these **engineered fibres** perform as biobased binders, composites and absorbents for various industries.



bio composites

Bio composite polymers are defined as materials for which at least a portion of the polymer consists of material produced from renewable raw materials. They are broadly defined as composite materials made from natural fiber or natural material and petroleum-derived non-biodegradable polymers or biodegradable polymers (starch, PLA, PHA). Recently, biocomposites became highly valuable materials due to their environmental advantage over fossil fuels based materials.





The world's first **algae-blended EVA** to the footwear industry as a sustainable ingredient in flexible foams for applications such as shoes, sporting products, and accessories.



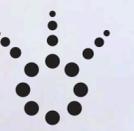
A blend of **wood fibers and polymers**: virgin, recycled or bio-based, offering the mouldability of plastic, yet the strength, workability and natural feel as well as sustainable benefits of wood. This can reduce CO₂ footprint by up to 80%.



Materials that are **reinforced with natural fibres** and have been designed for injection moulding



Made from 100% renewable raw materials and is biodegradable. It is **lignin**, which is second only to cellulose as the most abundant natural polymer. Mixed with natural fibres.



A **cellulose fibre reinforced plastic composite**, incorporating a renewable material content as high as up to 50%. The composite is specially designed for injection moulding applications, extrusion grades are also available.



The begrade family of compounds includes mainly **blends of fossil and bio-based biodegradable polymers**. The company increasingly replaces the plastic substrate by a biodegradable alternative.



post-consumer (PCR)

The recycled product of waste created by consumers.

Before the plastic waste is turned into resin, the plastic materials are gathered and sent through a proprietary process to produce plastic resin pellets.

The advantages of using PCR are: reduction of waste and lowering CO2 emissions, cost and quality of the resin can be equivalent to virgin.

The recycling process can be a mechanical one or a chemical one.

Mechanical Recycling - processing of waste plastics by physical means.

The waste is collected, sorted, separated, ground, washed and reprocessed before it can be mixed with virgin plastics of the same type for moulding new products.

Chemical Recycling - a process by which a polymer is chemically reduced to its original monomer form so that it can eventually be processed (re-polymerized) and remade into new plastic materials.

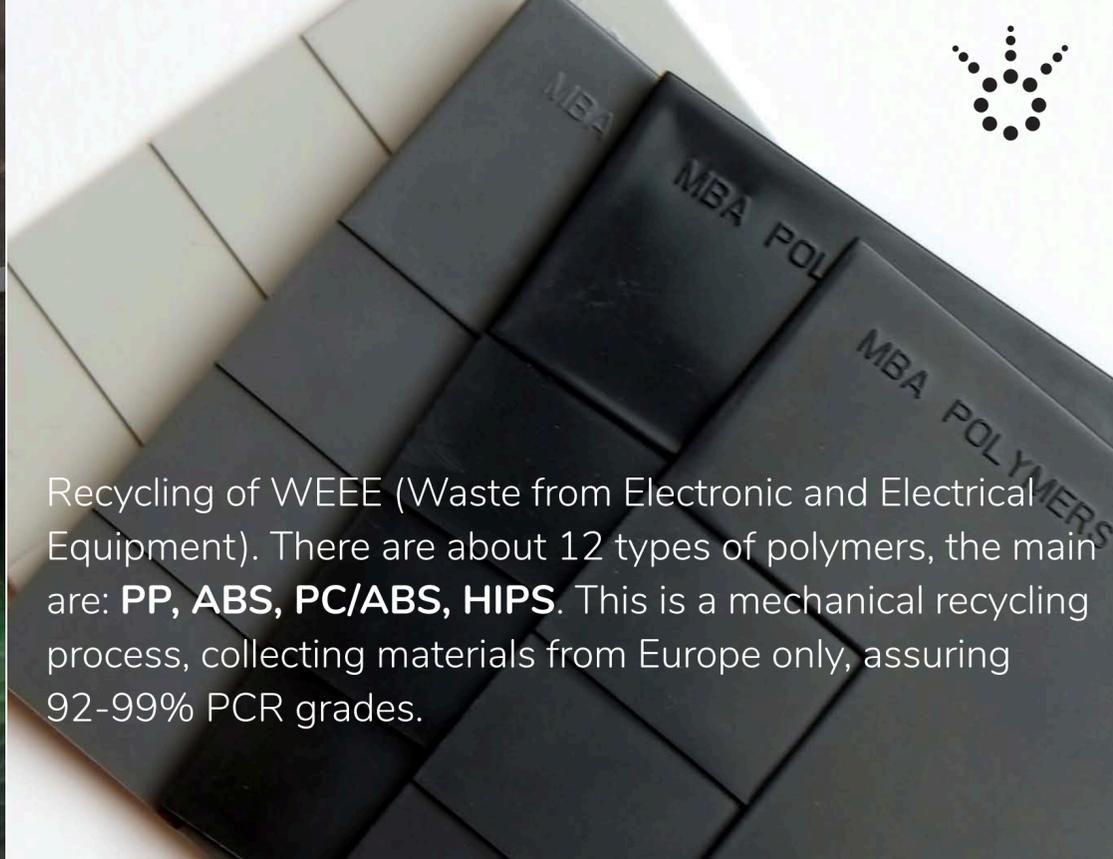
The quality remains identical to that of the virgin materials.



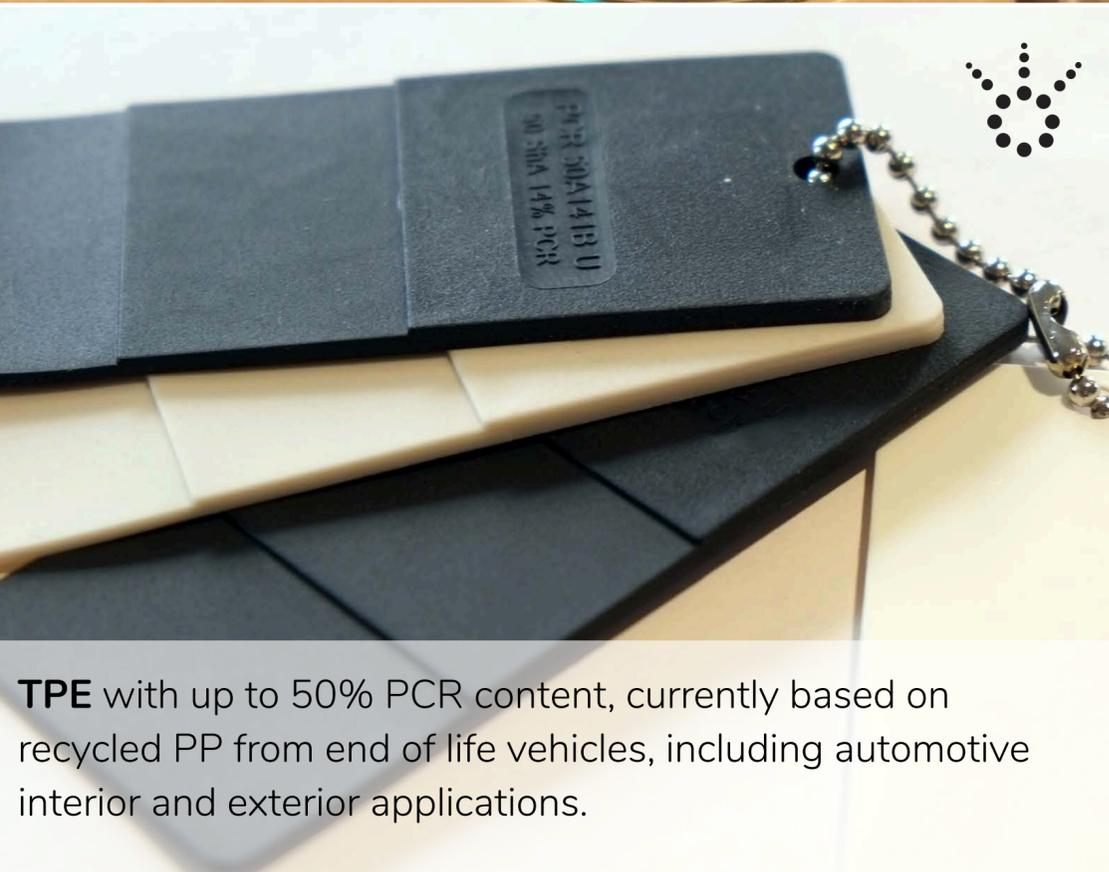
The world's first company **converting household waste** into a bio-based substitute for conventional plastic! A real solution to getting carbon negative.



Made of 100% recycled **glass** and is 100% recyclable, no colorants, no additives. Hand-selected raw material that is shaped into slabs then heated with a patented sintering process.



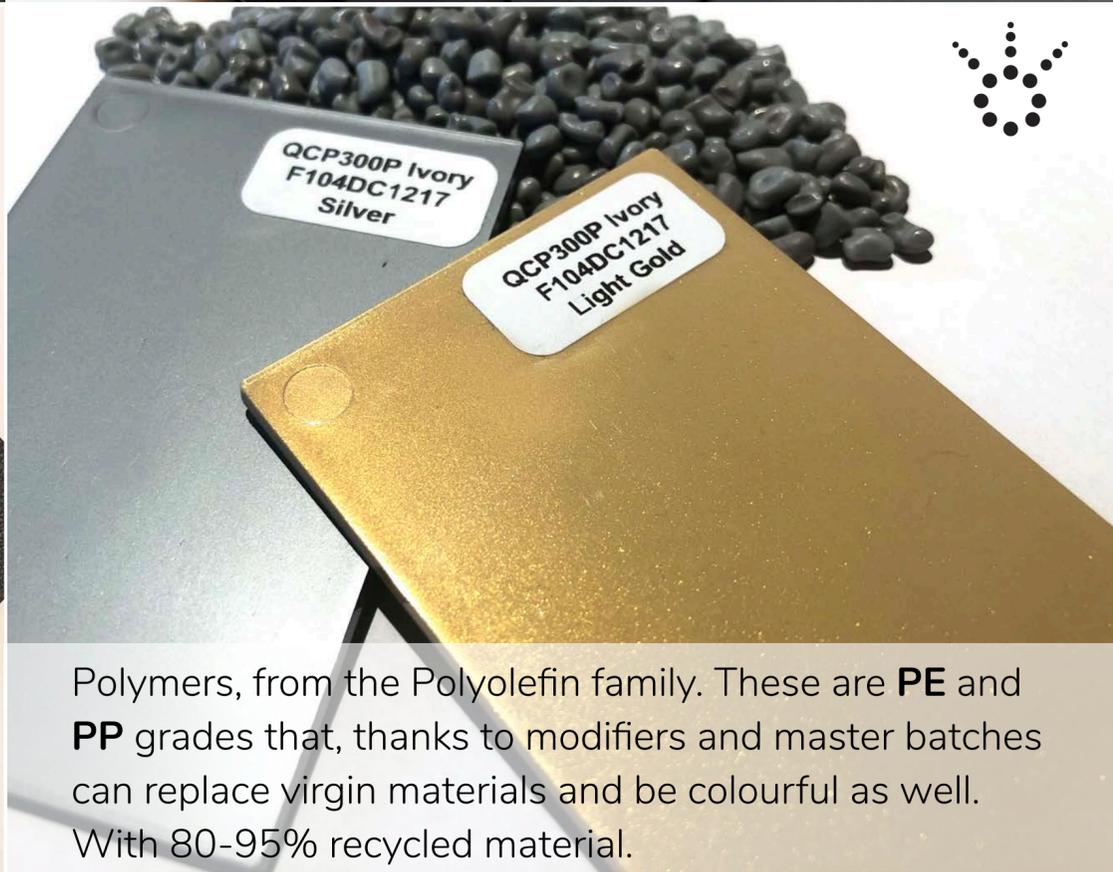
Recycling of WEEE (Waste from Electronic and Electrical Equipment). There are about 12 types of polymers, the main are: **PP, ABS, PC/ABS, HIPS**. This is a mechanical recycling process, collecting materials from Europe only, assuring 92-99% PCR grades.



TPE with up to 50% PCR content, currently based on recycled PP from end of life vehicles, including automotive interior and exterior applications.



A mechanical post consumer recycling (PCR) **ABS** grade, with a PCR content of at least 50% in a standard black color. Intended for a wide range of applications and visible parts.



Polymers, from the Polyolefin family. These are **PE** and **PP** grades that, thanks to modifiers and master batches can replace virgin materials and be colourful as well. With 80-95% recycled material.

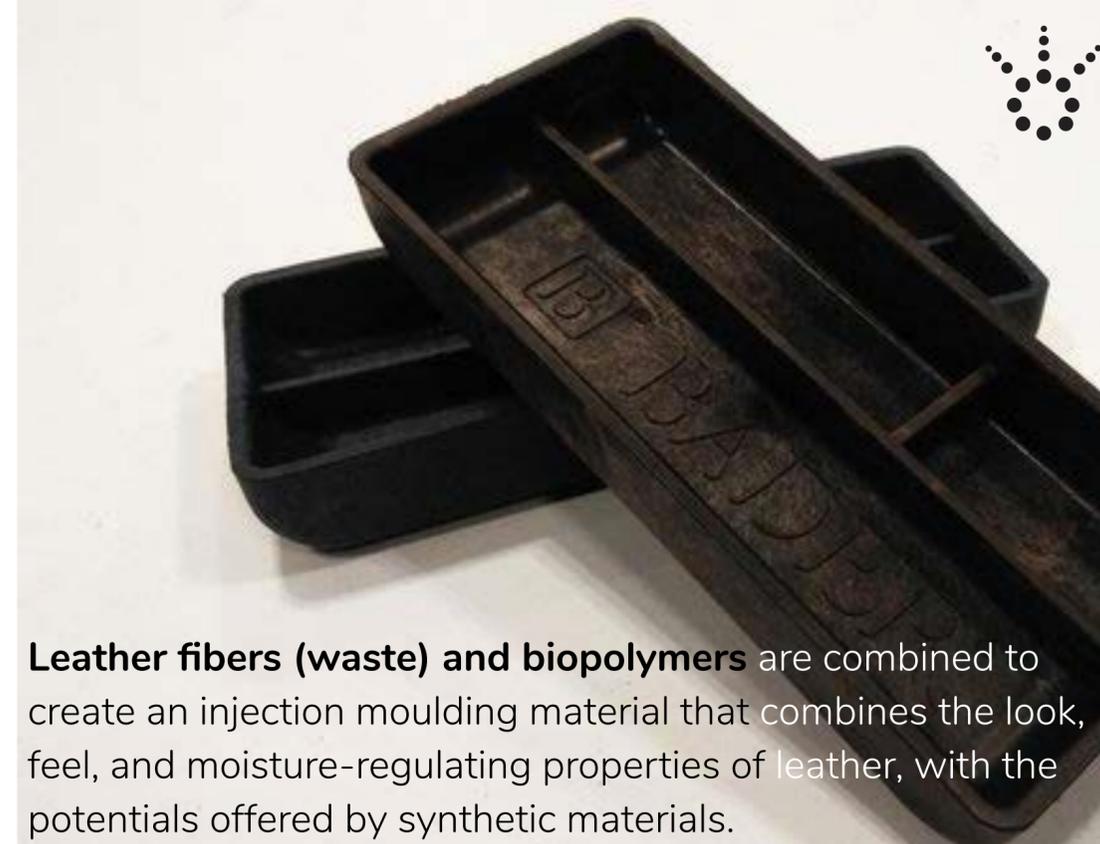


post-industry (PIR)

Such materials have a composition that contains some percentage of manufacturing waste material that has been reclaimed from a process generating the same or a similar product. For example: Rejected injection moulded plastic parts are then regrinded and put back into the converting cycle.



Recycled Hospital Textile was a one-off project with a Swedish healthcare organisation. The material is not commercially available, but Trifilon is open to collaborations/partnerships with public institutions that are looking to use their materials in a circular cycle.



Leather fibers (waste) and biopolymers are combined to create an injection moulding material that combines the look, feel, and moisture-regulating properties of leather, with the potentials offered by synthetic materials.



Up-cycled insulation, created in three steps; **recovered camel hair fabrics are gathered** and sorted, then they are transformed through a mechanic process into very fine fibres, lastly, the fibres are blended with recycled polyester.



This is a **100% PIR ASA** material, production waste of the medical industry. These re-compound, recycled plastic granulates are of the same quality as virgin material.



A high-density material made from **end-of-life textiles and cut offs**. The core is made from white cotton from industrial laundries. 70% textile, 30% bicomponent binder.



Compounds, made from **recycled carbon fiber sheets**, have excellent mechanical properties, suitable for injection moulding. These are **PP or PA grades with 10, 30 or 40% carbon content**.

compostable

Compostable materials are biodegradable ones, with the benefit of adding nutrients to the soil. Compostable materials typically require controlled industrial composting conditions. It is arguable if they provide any nutrients to the soil. Another disadvantage of using compostable materials is that the resources and raw materials are lost.

Residential Compost

>90% physical degradation within 6 months and >90% chemical degradation within a year under circumstances below 35°C.

Industrial Compost

>90% physical degradation within 3 months and >90% chemical degradation within 6 months under circumstances between 50 and 60 °C.

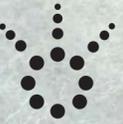
*the photo on the left is empty of materials - not because they de-composed, but because we forgot to document them in a group photo.



A family of **hemp fiber reinforced biocomposites** whose resins are starch-based PLA, made from responsibly-grown sugarcane and beetroot among other plants. All main ingredients come from agricultural products. **They're also compostable.** Suitable for injection moulding.



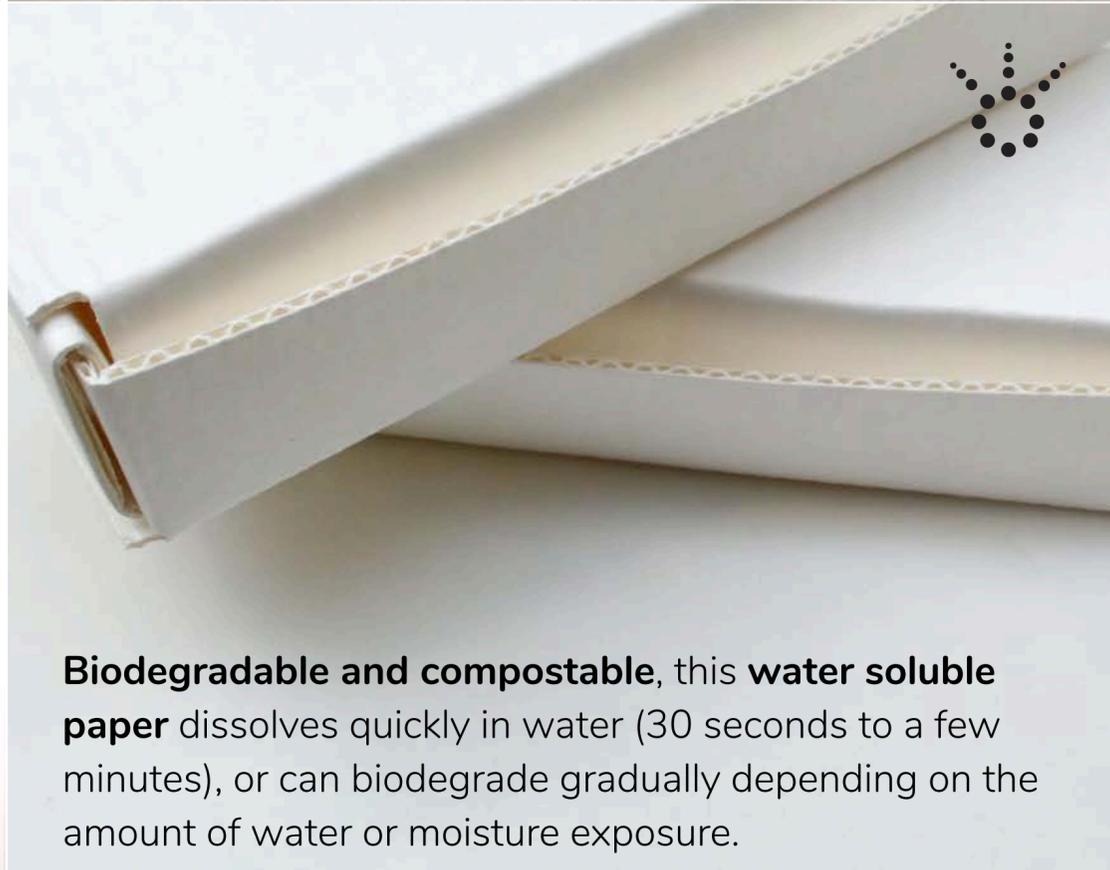
Injection mouldable **packaging solutions** for consumer electronics, medical, cosmetics and dry foods, made out of locally sourced renewable raw materials; **Industrial starch + natural fibres + water + premix**, it is home compostable.



New! Not yet online but commercially available, rapidly **compostable & biodegradable cellulose (Lyocell fibers)** thermal insulation wadding, bacteriostatic, with quick-drying properties, moisture management. Ideal for sportswear.



Consists of **coconut fibre and a natural binder**, this material can be pressed into many different shapes for tailor made packaging solutions. It is **bio-degradable and compostable.**



Biodegradable and compostable, this **water soluble paper** dissolves quickly in water (30 seconds to a few minutes), or can biodegrade gradually depending on the amount of water or moisture exposure.



Containing 0% crude oil based materials, using **only agricultural waste and additives**, this platform enables implementation of the circular economy by using your own waste streams as a source.

materialscout

materialscout helps market leading companies to enhance their product's value through creative, competitive and sustainable implementation of materials and technologies.

We help brands develop materials strategies that embrace methods of circular economy.

* Materials Strategies with a sustainable and circular approach.

* Materials Research - finding alternative materials solutions, targeting cost efficiency, emotional attachment, industry innovations, market trends and sustainability.

* Materials-Led Design - accompanying the creation of products and spaces.

* Materials Libraries - tailor made for companies and academies.

* Material Workshops, Talks, Exhibitions, Articles

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