

# DESIGNING



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# Transforming Denim Waste into Sustainable Innovation



Denim jeans have become an indispensable part of our modern-day wardrobe, with the majority of us owning at least one pair. But have you ever stopped to consider how these universal garments are made, their environmental impact, and what happens to them once they reach the end of their life cycle?



Denim fabric is traditionally made from cotton, although modern denim blends may include synthetic fibres like polyester or elastane for stretch which shed microplastics when washed or worn. One of the defining characteristics of denim is its indigo-blue colour. The yarns are dyed using a process where the yarn is repeatedly dipped into a vat of indigo dye.

Denim production is water-intensive, particularly during the dyeing process. Indigo dyeing requires large amounts of water, and conventional dyeing methods can result in water pollution due to the release of chemicals into waterways. Denim production also generates various forms of waste, including excess fabric scraps, wastewater, and chemical byproducts.

## Denimolite

Josh Myers is the mind behind Denimolite, a product that breathes new life into discarded denim, offering both aesthetically pleasing products and environmentally friendly designs. Denimolite is not just another recycled denim product; it's an upcycled denim composite that repurposes waste from second-hand clothing markets and the fashion industry into a new high-grade material. What sets Denimolite apart is its innovative use of plant-based bio-resin during production, utilising co-products from other industries, thereby avoiding competition with food production or agriculture.

## Addressing Textile Pollution

In response to the global textile pollution crisis, Denimolite offers waste disposal solutions for stretch denim, a notoriously difficult material to recycle due to its complex composition. Traditional recycling methods



*"I was inspired in part by Artist Jorge Penandés and his work 'structural skin' and my own personal experience reselling vintage clothing. I found out first hand just how much second hand clothing is completely unsellable, then through researching the wider issues with the fashion industry and second hand clothing markets opened my eyes to the global problem we are all facing when it comes to fashion waste. I was shocked to learn about the fabric land fill sites that are polluting Kanta Manto Ghana and Alto Hospicio Chile and decided to see what could be done with unusable fashion waste - through experimenting with textile offcuts and resins I created denimolite, an innovative material that's revolutionising fabric recycling."*



often involve labour and chemically intensive processes to separate man-made fibres from easily recyclable cotton. Denimolite's approach not only mitigates environmental harm but also provides a viable solution for the recycling of challenging denim materials.

## The Visionary Behind Denimolite

Josh Myers' journey from rural Cumbria to the busy streets of London and South Bank University is inspirational. During the Covid lockdown, Josh's experimentation with shredded denim mixed with resin, inspired by his father's background as a prosthetic engineer, yielded promising results. Countless hours of dedication and experimentation led to the creation of Denimolite, a versatile material that seamlessly blends aesthetics with sustainability.

## Material Testing and Innovation

Denimolite's remains committed to innovation by continuing meticulous material testing procedures. From side point loading tests to tensile and compression testing, Denimolite undergoes comprehensive assessments to ensure its resilience, structural integrity, and versatility. These tests reveal Denimolite's remarkable capabilities, showcasing its potential for various applications.

Josh Myers' journey is a testament to the power of persistence and passion in driving positive change. As consumers, we have the opportunity to support sustainable innovation by embracing products like

Denimolite that prioritise environmental stewardship without compromising on quality or aesthetics.

Denimolite represents a paradigm shift in the way we perceive and utilise denim waste. The incineration of denim waste releases harmful pollutants and greenhouse gases into the atmosphere, contributing to air pollution and climate change. Additionally, the burning of denim treated with flame retardants or other chemicals can release toxic fumes, posing risks to human health.

By adopting a circular approach to denim production and consumption, we can minimise waste, conserve resources, and mitigate the environmental impact of denim waste on our planet. Transforming discarded garments into valuable resources reduces environmental impact and creates a culture of sustainability and innovation. As we navigate the challenges of a rapidly changing world, initiatives like Denimolite remind us of the transformative power of creativity and determination in shaping a brighter, more sustainable future. ✕

## Links



Denimolite  
[www.denimolite.com](http://www.denimolite.com)

Find out more in Josh's own words by tuning in to the latest episode of "Designed for Life" featuring the founder of Denimolite. This podcast series is sponsored by the Edge Foundation.

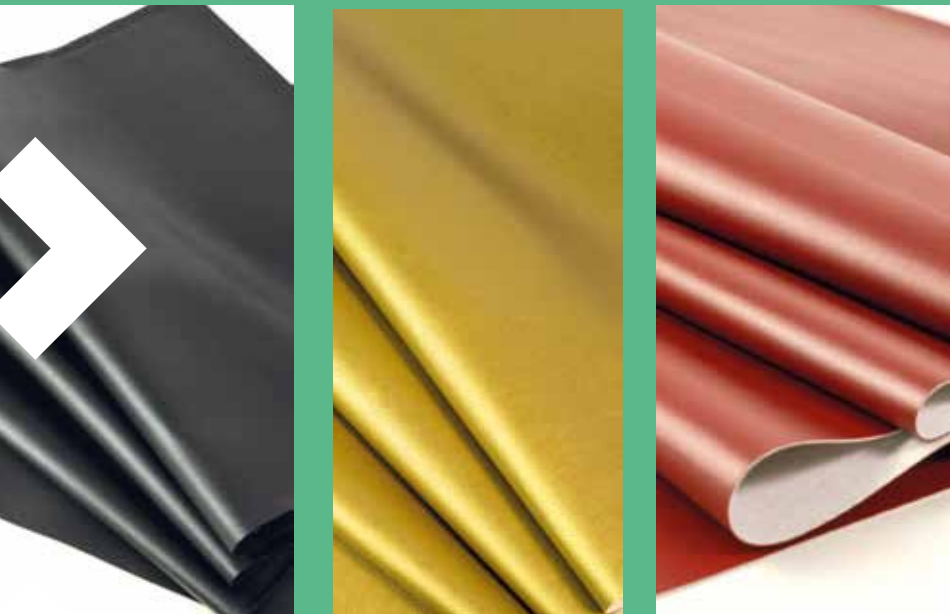
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# Rise of Sustainable Leather Alternatives

Sustainability is increasingly becoming an important part of the design process as designers feel a growing sense of ethical responsibility to create products and solutions that don't harm the planet or exploit communities.



We are seeing a focus on alternative materials across the fashion sector. One of the primary drivers of material innovation is the quest for sustainable alternatives. Designers and scientists are developing materials that are renewable, biodegradable, or recyclable, reducing the environmental impact of manufacturing and consumption.

Innovations we are seeing in manufacturing technologies such as 3D printing, nanotechnology, and biotechnology are also enabling the creation of new materials with unique properties and functionalities.

## Alternative Material

Some interesting alternatives include algae-based bioplastics. These bioplastics are biodegradable and can be used to create packaging, disposable cutlery, and even 3D printing filaments, reducing reliance on fossil fuel-based plastics.

Mycelium, the root structure of fungi, is also being used to create biodegradable and sustainable alternatives to traditional materials like foam packaging and leather. We will cover more on mushroom derived packaging in more detail in the next issue of Designing.

## Consumer Attitude

There has been a definite shift in consumer attitude towards fashion and the quest for a greener wardrobe as part of a broader shift towards more conscious consumption habits. This change in attitude also puts the spotlight on fashion companies to adapt their business models and incorporate more sustainable practices throughout their operations.

## DESSERTO® Cactus Leather

Adrián López Velarde and Marte Cázares found a pioneering technique for crafting vegan leather from cacti. Their creation, named DESSERTO®, has a remarkably realistic appearance. Cultivated on their plantation in Zacatecas, Mexico, the cacti's tough and textured skin lends itself to mimicking the feel of animal leather.



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They harvest mature sturdy nopal cactus leaves which are native to the sun-soaked landscapes of Mexico. The leaves are then cleaned, mashed and dried out in the sun.

What's left is a soft, durable fabric that looks and feels like leather, but it's much more sustainable. They don't use any harmful chemicals or PVC in the process.

The nopal cactus is a plant that thrives in dry regions with minimal water and resources. Unlike traditional leather production, which often involves intensive farming and significant environmental impact, cactus leather requires less water and land making it a more sustainable alternative.

DESSERTO®, cactus leather is biodegradable, which means it breaks down naturally over time and is free from PVC and phthalates. It's a great example of how creativity and thinking outside the box can lead to solutions that help the environment.

It has been used by renowned fashion designer Karl Lagerfeld in a collection of stylish bags and accessories. The leather demonstrates strength for Adidas boxing gloves and has also been used in the interior of Mercedes-Benz showcasing timeless glamour.

Cactus Leather exhibits properties similar to traditional leather, including durability and flexibility. It can be dyed in various colours and textures, offering designers and manufacturers a wide range of options for creating sustainable and stylish products.

It offers excellent tensile strength, abrasion resistance, and colour fastness, making it suitable for a wide range of applications, including fashion accessories, upholstery, and automotive interiors.

## Piñatex

As well as cactus leather there have been other advances including leather made from the cellulose fibres extracted from pineapple leaf leaves. Piñatex is the trade name Piñatex was developed by Carmen Hijosa and first presented at the PhD graduate exhibition at the Royal College of Art, London. Piñatex is a plant-based, non-woven material which offers a sustainable and vegan textile.

## Material alternatives in the design process

These examples are great demonstrations of sustainable material alternatives and ethical considerations in design and manufacturing. Design decisions and developments like these showcase the importance of environmental stewardship in the context of product development. ✕

## Links



DESSERTO®  
desserto.com.mx



WATCH: how cactus leather is made  
www.youtube.com/watch?v=oZyqLpT8aNM



WATCH: How to make a homemade bioplastic bag  
www.youtube.com/watch?v=Lh\_KwJcQT6k

