Germany

Topic:
Innovation Transformation

Achievement:
Cross- Sectoral Pioneers Sustainable Practices Greening Practices Innovative Practices

Sector:
All CCS and Cross-sectoral Design & Fashion

Revoltech is Turning Hemp Waste into Leather's Replacement

Revoltech transforms agricultural waste into revolutionary leather alternatives, developing fully bio-based, biodegradable materials made from hemp and algae that promise a sustainable solution for fashion, automotive, and design industries.

Challenge

Traditional leather production is environmentally intensive and tied to animal agriculture, while most alternatives rely on synthetic plastics like PVC or polyurethane, limiting biodegradability. The challenge was to develop a truly sustainable, scalable material that avoids greenwashing, reduces carbon impact, and meets industrial performance standards across sectors such as fashion and automotive.

Solution

Revoltech developed fully bio-based, biodegradable leather alternatives from hemp waste (LOVR) and algae (MATTR). By using plant fibres as structural components without synthetic matrices, the company created circular materials with a low or negative carbon footprint, now applied in products and scaled through partnerships with industries like automotive and design.

Impact

Revoltech demonstrates that waste-based, fully circular materials can meet industrial demands while significantly reducing environmental impact. Its innovations influence both fashion and automotive sectors, encouraging a shift away from synthetic “green” alternatives. By proving scalability and performance, the company contributes to redefining material standards and advancing genuinely sustainable production models.

Milestones & Learnings

Founded in 2020 as a spin-off of Technical University of Darmstadt
Identified hemp agricultural waste as a key untapped resource
Developed LOVR, a hemp-based leather alternative free from plastics
Introduced MATTR, an algae-based material (pilot stage)
Achieved carbon-negative input through hemp cultivation properties
Early adoption by brands (e.g. watch and camera accessories)
Recognition through major awards (German Sustainability, Ecodesign, Design Awards 2025)

Key Takeaways

- Genuinely circular bio-based materials require the complete elimination of synthetic matrices — not just the addition of natural fibres to a plastic base.
- Agricultural waste streams, such as hemp fibre residues, can become high-performance structural materials with a net negative carbon footprint.
- The automotive industry has emerged as an early and influential adopter of leather alternatives, creating scale and validation that benefits the fashion sector.
- Designers and brands bear responsibility for interrogating sustainability claims: asking detailed questions about input materials, carbon footprints and end-of-life scenarios is now a professional obligation.
- Developing new circular materials takes years — fashion’s seasonal pace must adapt to material innovation’s longer timeline.

Learn more about Revoltech on their official website.