

***Fabulose*: Fabricating vegan and circular leather alternatives from bio-tech derived cellulose**

Fabulose is an EU funded project coordinated by the German Institutes of Textile and Fiber Research (DITF). Its consortium consists of leading research institutes, biotech innovators, and industry stakeholders who aim to create high-performance, biobased and recyclable leather-like fabrics, using efficient biotech production routes for bacterial cellulose, cyanophycin and bacterial pigments

Current leather alternatives are either made from petrol-based plastics and non-recyclable, or they are (partly) biobased, but difficult to scale up and recycle. The project, supported by the Circular Bio-based Europe Joint Undertaking (CBE JU), is investigating how animal-based materials can be replaced by environmentally friendly alternatives in industries such as automotive, fashion, and upholstered furniture.

Fabulose uses advanced fermentation techniques, utilizes waste streams as feedstocks, and optimizes processes with the assistance of AI. This enables the environmentally-friendly and efficient production of bacterial cellulose, cyanophycin and pigments. These bio-based materials are combined in a coating formulation that replicates the durability and aesthetics of traditional leather. DITF's *HighPerCell®* technology allows for re-spinning of bacterial cellulose to filaments to create recycled textile backings that offer high tensile strength without toxic agents. Instead of processing individual batches, the technology also allows to implement a roll-to-roll production process, thereby simplifying future scale-up to cost-effective mass production.

In addition, market requirements have been collected to select optimal material characteristics, while *eco-design* and *Safe-by-design* principles

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help to assess potential risks and ensure alignment with the safety and sustainability objectives. A digital twin framework will include key process parameters for optimisation and monitoring of material performances.

Summary of the key project innovations:

- Using fermentation products to enable fast and cost-effective production of raw materials
- Grow micro-organisms on waste feedstocks and CO₂ to reduce production costs and environmental impact
- Re-spinning bacterial cellulose to filaments to create recyclable, consistent and high-quality fabrics
- Enabling production of cyanophycin to create durable coatings and finishing
- Implementing roll-to-roll production process to simplify future scale-up

The *Fabulose* project has a duration of 3,5 years and a budget of ca. 3,5 M euro.

The consortium includes 10 partners from 6 European countries, spanning the entire value chain, from research to real-world applications:

German Institutes of Textile and Fiber Research (DITF) (Germany), Next Technology Tecnotessile Societa Nazionale (Italy), University of Maribor (Slovenia), Sumatrix Biotech (Turkey), VTL GmbH (Austria), Novis GmbH (Germany), Melina Bucher (Germany), Benecke-Kaliko GmbH (Germany), Konrad Hornschuch GmbH (Germany), University of Aveiro (Portugal) and Steinbeis 2i GmbH (Germany).

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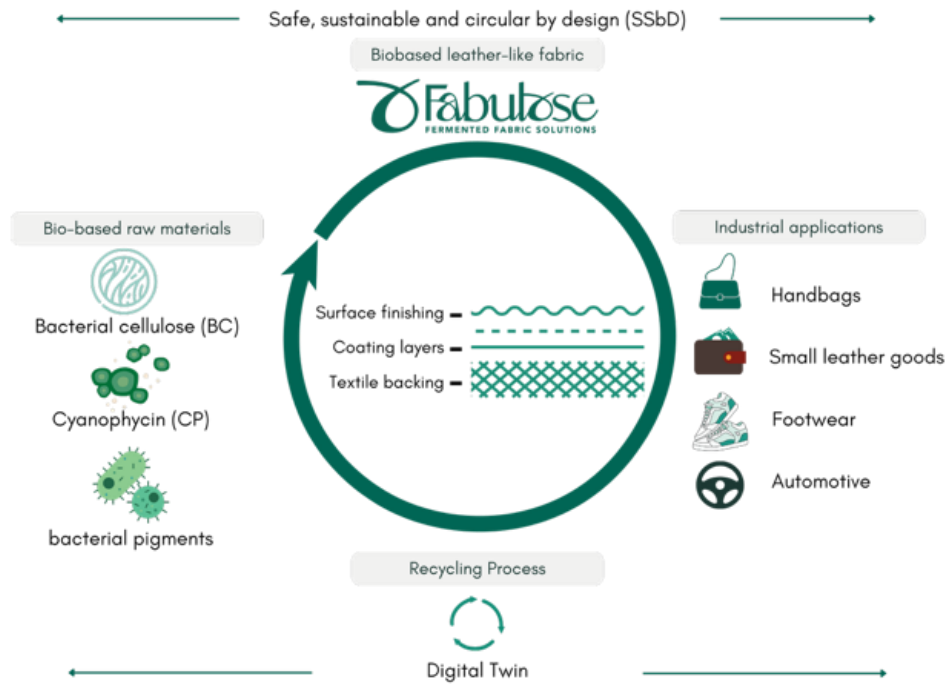
or: www.fabulose.eu/

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Infographic of *Fabulose*. Source: *Fabulose* project



Bacterial cellulose film produced by *Sumatrix*. Photo: Source: *Sumatrix Biotech* (CC BY-NC 4.0)