

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

## About this project



## ECO2-LInE

### Developing natural fibre-reinforced plastic components: with innovative 3D printing

Markets:



Material:

Bioplastics

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

## About this project

This project is funded by the Technology Transfer Programme Leichtbau (TTP LB) of the Federal Ministry of Economics and Climate Action.

[Technology Transfer Program Leichtbau](#)

## Context

Land vehicles consist of large and heavy components that are difficult to recycle. To make them lighter and more sustainable, lightweight, natural fibre-reinforced plastic components could replace the metal structures used today. These renewable raw materials are not only sustainable, but also have a lower density, better acoustic and mechanical damping and are biodegradable. Above all, their production consumes less energy and therefore emits significantly less CO<sub>2</sub>. Natural fibre-reinforced plastics are therefore particularly attractive for lightweight construction in mobile applications.

## Purpose

The project team wants to develop the new lightweight components for a wide range of industries and applications: special vehicle seats - for example a lightweight seat for use in electric vehicles and special vehicles - tractor crossovers or attachments for pick-ups. The researchers are pursuing a holistic approach. They not only want to make the components lighter with environmentally friendly materials, but also consider the entire life cycle: how can the utilisation cycle of the components, from material selection and production to use and recycling, become more sustainable?

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

## About this project

### Procedure

The researchers use the high-speed additive process SEAM (Screw Extrusion Additive Manufacturing). This innovative 3D printing process is eight times faster than conventional 3D printing. Thanks to the free shaping, even complex parts can be created. In addition, several conventionally manufactured individual components can be replaced by one additively manufactured part. The advantages: Digitalisation ensures shorter process chains and therefore faster production, the use of materials is as low as possible and manufacturers can produce many different individual pieces cost-effectively.

The team also uses natural fibre-reinforced plastics. The challenge with natural fibres is their ability to absorb moisture. The researchers want to solve this by means of an innovative pre-treatment of the fibres. The aim is not only to make the fibres water-repellent (hydrophobic) on the surface, but also on the inside to prevent them from penetrating the naturally occurring cavities and gaps.

The researchers are also carrying out ecological assessments of the individual fields of application over the entire life cycle. This enables them to demonstrate and further optimise CO<sub>2</sub> and resource savings right from the start. The partners are also laying the foundations for the transfer to industrial production, for example by further developing and testing the SEAM process through specific applications with industrial partners.

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

## About this project



**Funding duration:**

**Project partner:**



**Funding sign:**

03LB2017

**Funding amount:**

EUR 1.8 million

**Further websites**

[foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB2017A](https://foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB2017A) - ECO2-LInE in the federal funding catalogue

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

## Project coordination

### Contact:

Mr Martin Schnierle

+49 0821-299 93-542

[martin.schnierle@schnierle.de](mailto:martin.schnierle@schnierle.de)

### Organisation:

Hermann Schnierle GmbH

Dieselstrasse 43  
86368 Gersthofen  
Bavaria  
Germany

[www.schnierle.de](http://www.schnierle.de)



## Lightweighting classification

### Realisation

#### Offer

#### Products

Parts and components, Systems and end products



*Services & consulting*

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

Lightweighting classification	
	Realisation
<b>Field of technology</b>	
<b>Design &amp; layout</b> Lightweight manufacturing	✓
<i>Functional integration</i>	
<b>Measuring and testing technology</b> System analysis	✓
<b>Modelling and simulation</b> Optimisation, Processes	✓
<i>Plant construction &amp; automation</i>	
<i>Recycling technologies</i>	
<b>Manufacturing process</b>	
<b>Additive manufacturing</b> 3D printing	✓
<i>Coating (surface engineering)</i>	
<i>Fibre composite technology</i>	
<i>Forming</i>	
<b>Joining</b> Adhesive bonding	✓
<i>Material property alteration</i>	
<i>Primary forming</i>	
<i>Processing and separating</i>	
<i>Textile technology</i>	

# Developing natural fibre-reinforced plastic components: with innovative 3D printing

Lightweighting classification	
	Realisation
<b>Material</b>	
<b>Biogenic materials</b>	✓
Bioplastics	
<i>Cellular materials (foam materials)</i>	
<i>Composites</i>	
<i>Fibres</i>	
<i>Functional materials</i>	
<i>Metals</i>	
<i>Plastics</i>	
<i>Structural ceramics</i>	
<i>(Technical) textiles</i>	