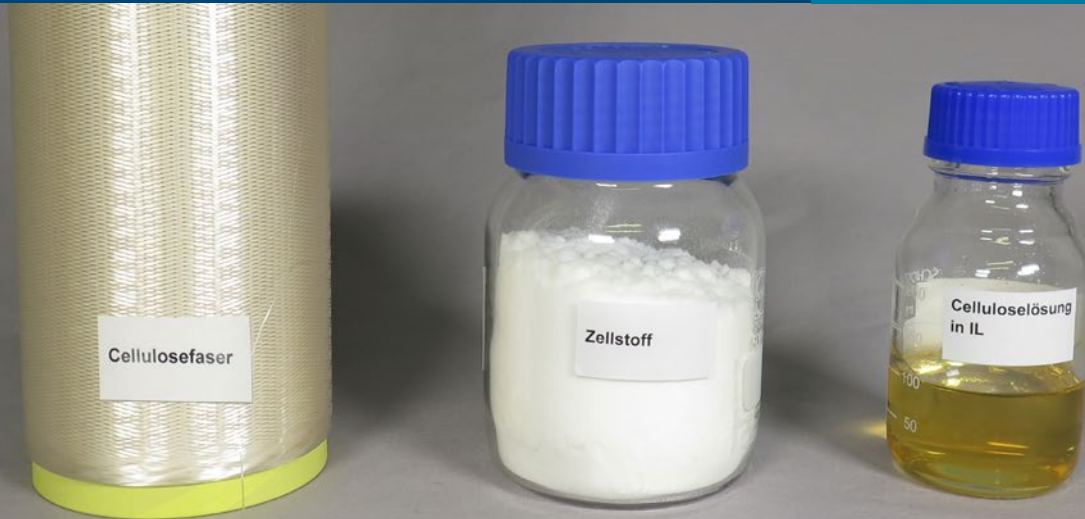




# Best practice example

for lightweighting in Germany

Cellulose composites



Source material for Purcell: cellulose fibres, pulp, cellulose IL solution

## Single-component composite material made of pure cellulose

### Fields of application



Automotives



Commercial vehicle  
manufacturing

In this example, lightweighting allowed for the following reductions compared to a conventional model made of fibreglass:



Recyclability approx. -98 %



CO<sub>2</sub> approx. -45 %

### Application

Purcell is a plastic made of reinforced cellulose fibres and a cellulose matrix. It is used in the transport sector and the automotive industry. Given its purity, Purcell is particularly easy to recycle, thus helping to prevent end-of-life waste.

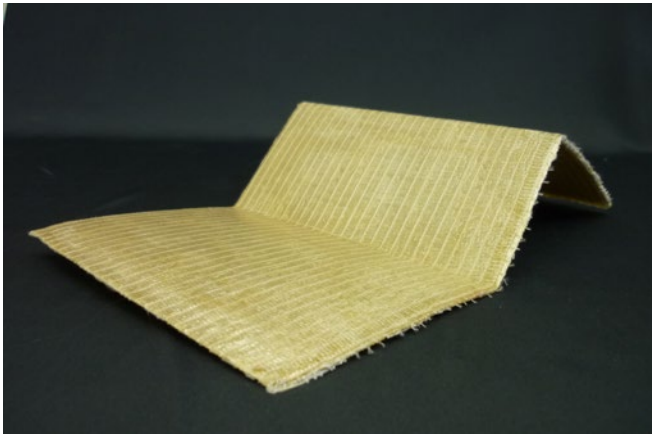
### Challenge

Fibre-reinforced plastics (FRPs) consist of reinforcing fibres and petroleum-based polymer matrices. The disadvantage of FRPs is that there is no technically feasible way of fully recycling the end-of-life waste they produce. Such waste can only be thermally recycled via pyrolysis of the polymer matrix. The remaining ashes, however, need to be disposed of.

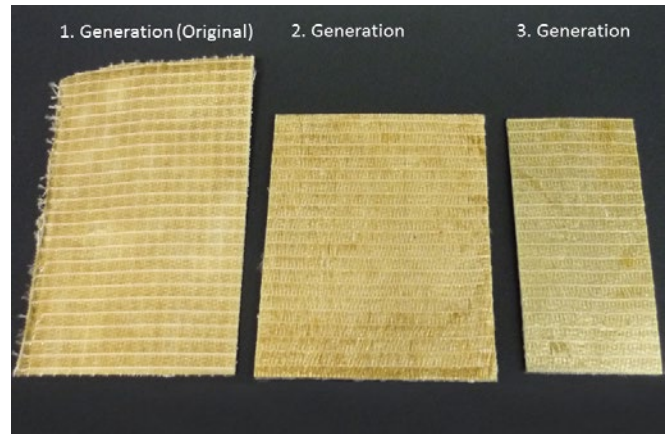
### Solution

Given its purity, the cellulose composite – unlike FRPs – can be recycled completely. Since cellulose is a renewable resource, Purcell is a sustainable composite material whose mechanical properties are, to a certain extent, superior to those of typical biocomposites.

## Best Practice Example | Cellulose composites



Source material: Z-section Purcell composite



Composite materials from recycling trials

### Other potential applications



Construction sector



Sports and leisure equipment



Other (lifestyle products)

It has recently been proven that the cellulose composite, after having been recycled a first time, can achieve mechanical properties similar to those of the original material. Moreover, they can be compared to the properties of GFRPs. The material, which is malleable when wet, also lends itself to creating different sections such as a Z-section. By means of an established analytical procedure, it is possible to upscale

composite material production while ensuring consistent quality. In particular, the static wash step is to be upgraded to a dynamic, continuous process. In view of the instability of the cellulose composite in response to moisture and UV, there is a need for further research to make this approach attractive for other fields of application as well, including sports and lifestyle products.

By means of surface treatments, it is also possible to enhance the aesthetic of the cellulose composite. Compliance with all requirements relevant for the sector is being ensured. Research activities are being conducted so as to further improve health and safety, environmental protection and recycling.



### The LIGHTWEIGHTING ATLAS

The LIGHTWEIGHTING ATLAS is an interactive web portal that pools information on those active in lightweighting and their skills across different industries and materials. The atlas is free to use and entries into the atlas are also free. You can find the LIGHTWEIGHTING ATLAS at [www.leichtbauatlas.de](http://www.leichtbauatlas.de)

#### The Lightweighting Initiative

Modern lightweighting is of pivotal importance for German industry and its competitiveness. Federal Ministry for Economic Affairs and Climate Action has established the Lightweighting Initiative to support lightweighting in Germany. The Lightweighting Initiative Coordination Office in Berlin, which is financed as part of the initiative, pools all activities relevant to lightweighting and supports German companies, especially SMEs, as they implement lightweighting.

#### Contacting the Lightweighting Initiative Coordination Office

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