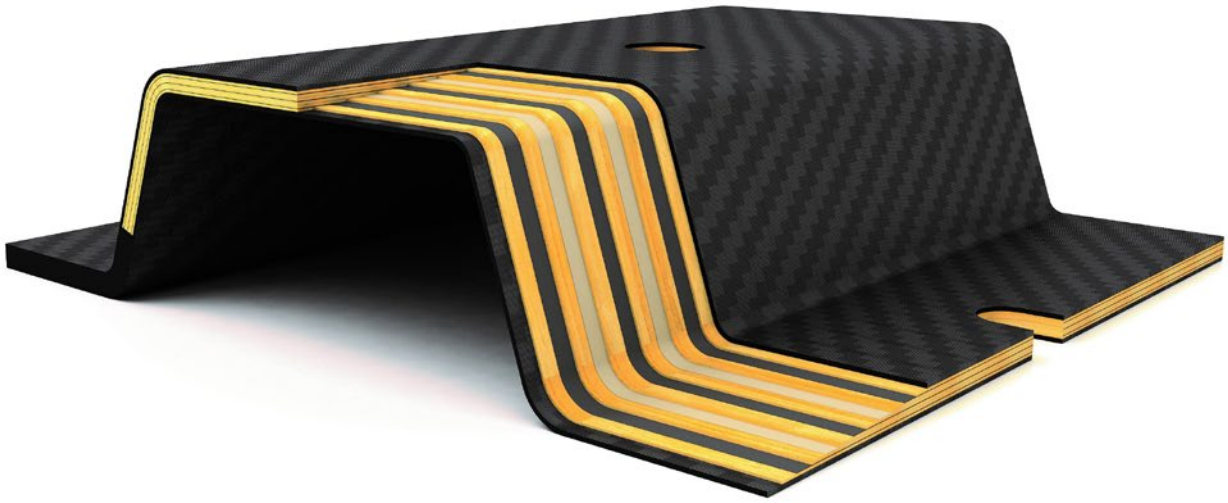
Federal Ministry
for Economic Affairs
and Climate Action

Best practice example

for lightweighting in Germany

Wood-based CFC moulded parts



Example of a wood-based CFC moulded part

Wood-based CFC moulded parts

Fields of application

Automotives

Commercial vehicle manufacturing

Railway vehicle manufacturing

In this example, lightweighting allowed for the following reductions compared to a conventional aluminium-based model:

Weight approx. -50 %

Energy approx. -30 %

Application

Wood-based CFC moulded parts are used for large-surface or supporting elements in vehicle manufacturing, e.g. in cars, light commercial vehicles and railway vehicles. The wood-based CFC composite enables the production of large-surface structuring components which themselves represent a very interesting economic and technological approach in terms of mixing materials.

Challenge

The challenge is to integrate renewable resources into supporting lightweight elements and to achieve optimised weight with a view to reducing energy consumption.

Solution

Using composite materials from thin veneer with carbon fibres combines the advantages of both materials.

Another example of a wood-based CFC moulded part

Rear view of a wood-based CFC moulded part

Other potential applications

Shipbuilding (boats/yachts)

Aircraft construction (light aircraft/drones)

Wind turbines

Wood-based CFC moulded parts allow for vast reductions compared to conventional models, including weight reductions of approx. 85% compared to steel – and approx. 60% compared to aluminium – and the resultant reductions in energy consumption. Moreover, a composite made of beech wood (≥ 50%) and CFC provides high vibration damping. Beech-based materials have special technical and mechanical properties, including abrasion and wear resistance, dimensional stability and breaking load. Beech is one of the toughest and strongest types of wood. While it only weighs a tenth compared to an equally sized component made of construction steel, it has a third of its firmness.

Moreover, timber products are long-term carbon storage units. A cubic metre of wood absorbs almost a tonne of CO_2.

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

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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