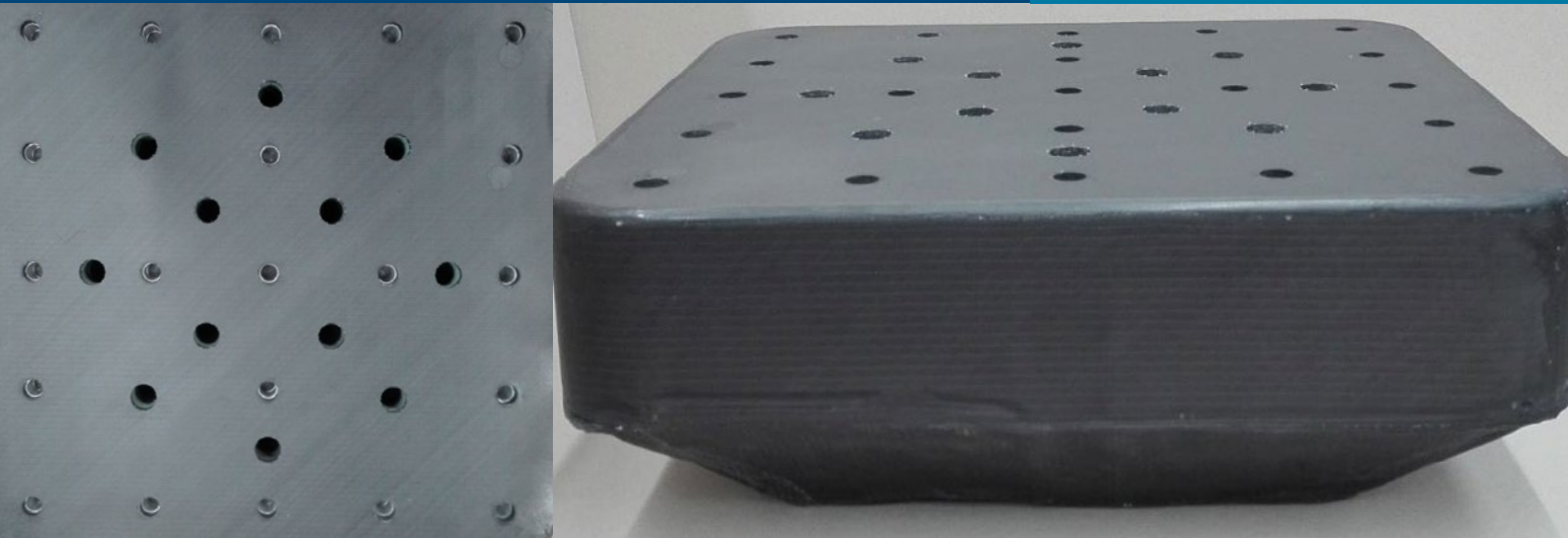




Best practice example

for lightweighting in Germany

Sandwich



Prototype for a vibration test

Sandwich composites made of FRP and plastic foam

Fields of application



Automotives



Machinery and plant
construction



Aircraft construction

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



Weight approx. -30 %



Energy approx. -80 %

Application

Substituting conventional metallic construction materials with hybrid materials that lend themselves to lightweighting allows lightweight construction designs to be developed for movable components of machinery and plant. This helps reduce the overall weight of vehicles, aircraft and vessels.

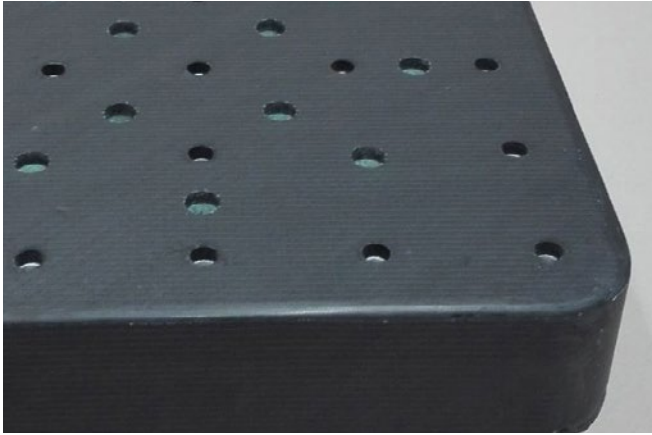
Challenge

A clamping table made of magnesium and used as part of an electrodynamic vibration test system served as a reference component for demonstration purposes. The objective was to reduce the required weight by applying hybrid sandwich construction and load-adjusted fibre-orientation.

Solution

A manufacturing process was designed to test and numerically replicate the static and dynamic behaviour of such sandwich composite materials. This resulted in new engineering insights useful in the development and construction of structural components with complex shapes. Also, load-dependent and energy-efficient machine controls were developed.

Best Practice Example | Sandwich



Prototype



vibration test system

Other potential applications



Commercial vehicle manufacturing



Rolling stock construction



Shipbuilding



Spacecraft vehicle manufacturing



Other vehicle manufacturing

This manufacturing process makes it possible for novel and lightweight machinery components to be produced at a more cost-efficient price.

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.

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