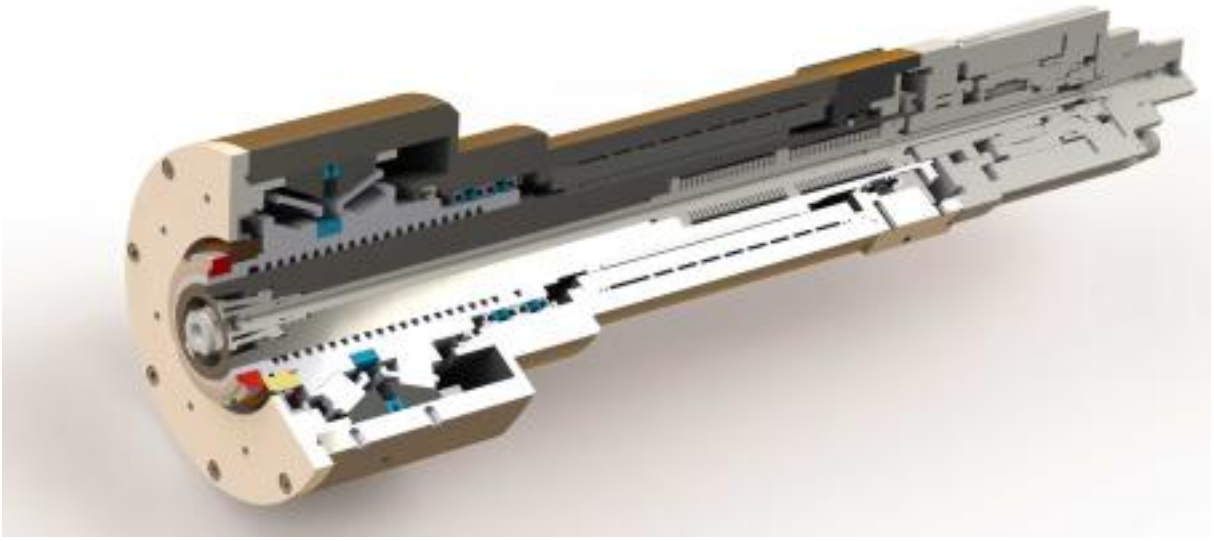
Reducing the CO2 footprint of cars: hybrid components made of aluminium and steel

About this project



CO2-HyChain

Reducing the CO2 footprint of cars: hybrid components made of aluminium and steel

Markets:

Material: Aluminium, Steel, Other metals

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

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Context

Road traffic in Germany causes around 160 million tonnes of CO2 every year and is therefore responsible for around 20 percent of the country's total CO2 emissions. One effective method of reducing the CO2 emissions caused by cars is to reduce vehicle weight through functional lightweight construction. Three technologies in particular are currently being used for this purpose: High-strength aluminium alloys, aluminium-steel mixed construction and Tailor Welded Blanks (TWB) - welded body parts made of steel sheets with different strengths and thicknesses.

Purpose

The researchers in the CO2-HyChain project aim to combine these technologies in order to further reduce vehicle weight. In particular, high-strength aluminium TWBs and hybrid aluminium-steel TWBs are to be used. By using aluminium and steel together, the participants want to combine the positive properties of the two materials - in particular the high strength of steel and the low weight of aluminium.

The project partners want to transfer the solutions researched on a laboratory scale to industrial production through technology transfer and further develop the entire value chain. The introduction of these technologies should reduce the CO2 footprint of passenger cars by up to 15 per cent.

Procedure

The researchers are developing new welding methods and heat treatment techniques to economically produce high-strength aluminium-steel joints with different sheet thicknesses. They also want to significantly improve the mechanical properties and durability of the weld seams, which will significantly expand the industrial applications of high-strength aluminium and hybrid aluminium-steel TWB.

In order to integrate these technologies into existing production processes and make production more economically and ecologically sustainable, the project partners are developing highly efficient production systems for the manufacture of large-format aluminium-steel TWB and tailor-welded coils (TWC) - coils made from metal strips of different materials or thicknesses. They develop control and regulation concepts to enable reliable process control and ensure sufficient quality of the TWB and TWC. They also focus on the development and implementation of new recycling concepts in order to further maximise resource efficiency.

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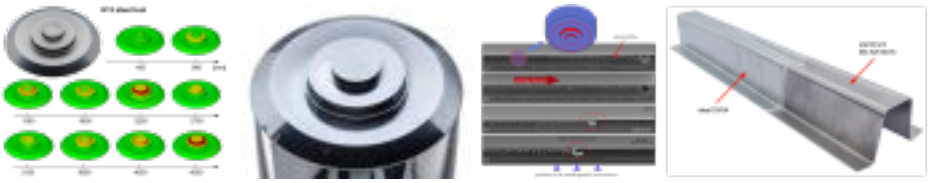

Funding duration:

Project partner:

Funding sign: 03LB4003

Funding amount: EUR 3.5 million

Further websites foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB4003A - CO2-HyChain in the federal funding catalogue

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Project coordination

Contact:

Mr Martin werz

+49 0711 685 62597

martin.werz@mpa.uni-stuttgart.de

Organisation:

University of Stuttgart MPA Materials Testing Institute

Pfaffenwaldring 32
70569 Stuttgart
Baden-Württemberg
Germany

www.mpa.uni-stuttgart.de/

Lightweighting classification

	Realisation
Offer	
Products Semi-finished parts, Machines and plants, Software & databases	✓
Services & consulting	

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Lightweighting classification

	Realisation
Field of technology	
Design & layout Hybrid structures	✓
Functional integration Material functionalisation	✓
Measuring and testing technology	
Modelling and simulation Processes	✓
Plant construction & automation Plant construction	✓
Recycling technologies Recycling	✓
Manufacturing process	
Additive manufacturing	
Coating (surface engineering)	
Fibre composite technology	
Forming Thermal converting, Deep-drawing	✓
Joining Welding	✓
Material property alteration	
Primary forming	
Processing and separating	
Textile technology	

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Lightweighting classification

	Realisation
Material	
Biogenic materials	
Cellular materials (foam materials)	
Composites	
Fibres	
Functional materials	
Metals Aluminium, Steel, Others	✓
Plastics	
Structural ceramics	
(Technical) textiles	