Making e-transporters lighter: Innovative body with modular battery tray system

About this project

ULAS E-VAN

Making e-transporters lighter: Innovative body with modular battery tray system

Markets:

Material: Aluminium, Other plastics

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

Technology Transfer Program Leichtbau

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Context

Small delivery vehicles with a gross vehicle weight of up to 3.5 tonnes are used across all industries for the transport of goods and materials. Until now, vans in this class have mainly been powered by combustion engines. In order to successfully decarbonise the transport sector, more and more battery-powered vans are needed.

However, if the vans are equipped with an electric drive, the high battery weight increases the unladen weight. As a result, the possible payload of the vehicles decreases. Innovative lightweight construction approaches can be used to reduce the weight of battery-powered delivery vehicles, increase the possible payload and range and reduce costs.

Purpose

In the Ulas E-Van project, researchers from industry and research are working on solutions to significantly reduce the weight of battery-powered vans through lightweight construction and thus increase their range. They are also aiming to reduce the battery size, secondary weight and therefore battery costs while maintaining the same range. To this end, the consortium is developing a new type of body structure and a modular and scalable battery carrier system for small electric commercial vehicles.

Procedure

The researchers are focussing in particular on modern CAE (Computer Aided Engineering) methods, i.e. computer-aided development and production approaches. For the superstructure, the aim is to transfer the proven frame-stringer design used in aircraft construction to commercial vehicle construction with higher production figures. The researchers are using simulation-driven component development (simulation-driven design) for this purpose. The frames are to be designed in one piece and bionically optimised with the help of simulations.

For the outer skin, prefabricated large-area, structural plastic parts that are connected to the load-bearing structure will be developed. To this end, the project team is utilising 3D printing processes for the production of large structural components and larger quantities. In the underbody, the researchers are integrating a load-bearing, ultra-light, scalable and modular battery carrier system that supports the body structure in terms of rigidity, fatigue strength and crash safety.

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Funding duration:

Funding sign: 03LB3086 **Funding amount:** EUR 3.2 million

Further websites foerderportal.bund.de/foekat/jsp/SucheAction.do?actionMode=view&fkz=03LB3086A - ULAS-E-VAN in the federal funding catalogue

Project coordination

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English (EN){{ Projektpartner }}

Lightweighting classification

	Realisation
Offer	
Products Parts and components	✓
Services & consulting	
Field of technology	
Design & layout Hybrid structures	✓
Functional integration	
Measuring and testing technology	
Modelling and simulation Crash behaviour, Loads & stress	✓
Plant construction & automation	
Recycling technologies Recycling	✓

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Lightweighting classification

	Realisation
Manufacturing process	
Additive manufacturing	
Coating (surface engineering)	
Fibre composite technology	
Forming	
Joining Welding	✓
Material property alteration	
Primary forming Casting	✓
Processing and separating	
Textile technology	
Material	
Biogenic materials	
Cellular materials (foam materials)	
Composites	
Fibres	
Functional materials	
Metals Aluminium	✓
Plastics Others	✓
Structural ceramics	
(Technical) textiles	