The IMA study on life cycle assessment (LCA) of magnesium

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Magnesium offers considerable potentials as lightweight material for various weight sensitive applications. In consequence of finding strategies for lowering the emissions from the transport sector, lightweight design is one of the solutions to increase the efficiency of vehicles, trains or aircrafts.

In order to assess the potential environmental benefits of magnesium, the International Magnesium Association (IMA) initiated a study on the life cycle assessment of magnesium. Environmental concerns of the production and use of magnesium are addressed as well as the end-of-life of magnesium components. A cradle-to-grave approach is to be chosen in order to include all relevant effects during the life cycle of the material. For the use phase, examples for passenger car and aircraft components have been selected to show benefits compared to aluminium.

This study aims to assess the life cycle of magnesium as lightweight material for weight sensitive applications. In our presentation, we will focus on the results of the assessment of an exemplary aircraft component.

Biographies

Simone Ehrenberger is a researcher at the department of "Vehicle Systems and Technology Assessment" at the DLR Institute for Vehicle Concepts. Her research focuses on life cycle assessment of vehicle components as well as the economic assessment of new train concepts and their operational potentials. She graduated from the University of Karlsruhe in 2006 and holds a diploma in geoecology. Before joining the Institute for Vehicle Concepts, she worked on various projects in the field of life cycle assessment at the Karlsruhe Institute of Technology as well as the research group for material flow and resource management at the Institute of Applied Sciences at Pforzheim University.

Prof. Dr. H. E. Friedrich studied engineering at the Technical University of Munich. After working in the engineering and consultancy sectors, he took up a senior management position in the aeronautical industry in 1986. He was responsible for new methods of construction and new materials, aircraft engines and optimising product development times. In 1996, Prof. Friedrich joined Volkswagen AG in Wolfsburg as head of vehicle research, where he was head of Group research for materials technology and vehicle concepts. He specialised in innovative materials and construction methods, and concept vehicles for future vehicle specifications. Since 2004 he is director of the Institute of Vehicle Concepts at the German Aerospace Center in Stuttgart and professor at the University of Stuttgart. The research fields are Alternative Power Trains and Energy Conversion as well as Light Weight Design and Hybrid Construction methods.