

AdRIA

LOEWE-Centre AdRIA Forming of functionally printed sheets

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Abstract

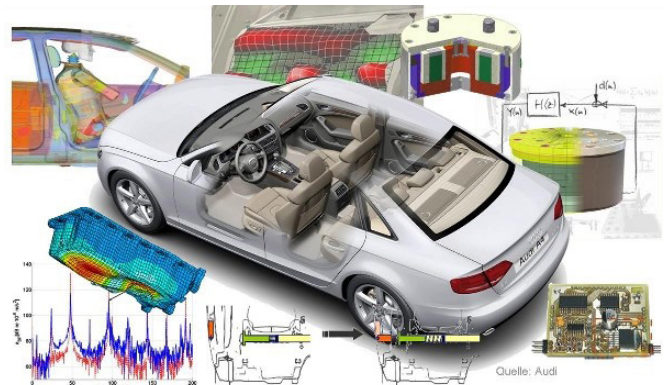
In the LOEWE Centre AdRIA, the complementary individual competences of the Fraunhofer LBF, the Technical University of Darmstadt and the University of Applied Sciences Darmstadt were brought together and further developed. The joint performance spectra in the key technology of adaptronics were bundled in such a way that they can be further developed in the sense of a holistic system competence and offered to the market in the long term. The PtU developed processes with which sensors and also electrical conductor paths based on conductive polymers can be printed on sheet metal structures and then formed.

Project description

Adaptronics describes an interdisciplinary technology with which autonomous structural systems can be realised that adapt independently to changing boundary conditions. These so-called adaptive structures require structurally integrated actuator and sensor systems based on multifunctional materials as well as a likewise structurally integrated, real-time capable and energy-autonomous control technology. All mechanical engineering constructions in which the vibration behaviour, the sound radiation, the contour and geometry properties up to the damage tolerance are to be actively influenced can be used as application scenarios.

Results

The integration of electrical and electronic components in structural components by forming has been developed as an economical method for the production of multifunctional components. Among other things, printing processes are used to print sensors and electrical conductors on the basis of conductive polymers. The forming processes of active-media-based deep drawing as well as flow splitting and roll forming are used to form metal sheets that are equipped with electrical and electronic components. High potential results from the integration of functional materials to give components additional sensory or actuator capabilities (see Figure 1). During the forming production of structural components, functional materials are integrated by applying the processrotary swaging.



[1] Adaptive vehicle

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Project partner

