

LOEWE-Zentrum AdRIA forming of functionally printed sheets

In the LOEWE Centre AdRIA, the complementary individual competences of Fraunhofer LBF, Darmstadt University of Technology and Darmstadt University of Applied Sciences were combined 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 holistic system competence and offered to the market on a sustainable basis.

The PtU has developed processes with which sensors and also electrical conductors can be integrated on the basis of conductive and nonconductive materials 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 realized that adapt themselves independently to changing boundary conditions. These so-called adaptive structures require structure-integrated actuator and sensor systems based on multifunctional materials as well as a real-time capable and energy-autonomous control technology that is also structure-integrated. All mechanical engineering designs in which the vibration behaviour, sound radiation, contour and geometric properties up to damage tolerance can be actively influenced can be used as application scenarios.



Picture 1: LOEWE-Center

Results

The integration of electrical and electronic components into structural parts by forming was developed as an economical method for the production of multifunctional components.

Among other things, printing processes are used for this purpose, with which sensors and electrical conductor paths are printed on the basis of conductive polymers. The forming processes of active-media-based deep-drawing as well as gap and roll forming are used to reshape sheets equipped with electrical and electronic components. High potential results from the integration of functional materials to give components additional sensoric or actuatoric capabilities. During the forming process for the production of structural components, functional materials are integrated by applying the processes of flow-forming and rotary swaging.

Acknowledgement

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Projektdata

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| Runtime | Feb. 2008 – Mar. 2013 |
| Worker | M.Sc. Mesut |
| Dept. | Process chain |

Sponsor



Projectpartner

