

## **HBM AWARD**

Prize awarded to

**Dr.-Ing. Torsten Troßmann**

For his work on the Technische Universität Darmstadt, Germany  
Fachgebiet und Institut für Werkstoffkunde

### **“Behavior of magnesium alloys in case of superimposed mechanical and corrosive load components”**

This work examines the degradation behavior of magnesium alloys under superimposed mechanical and corrosive loads.

Components made from the light metal aluminum are state of the art for many applications, different challenges have to be met when magnesium with an even higher specific strength is selected as an engineering material. These challenges arise on the one hand side due to the distinct influence of the manufacturing process on the material condition and fatigue strength and on the other side on the possible threat of corrosion of the extremely base and therefore degradable material. To approximate the long-term material behavior of simultaneously environmentally and mechanically loaded components of magnesium, the interacting damaging processes have to be described. Torsten Troßmann first had to develop new research methods to isolate the specific impacts of corrosion and mechanical load components on the crucial steps of corrosion fatigue. On basis of a hypothesis of the superimposed degradation process, he developed a guideline to judge the relevance of experimental data and to project an appropriate experimental simulation for different corrosive loading conditions, including the near-service atmospheric corrosion.

On the frame work of his developments, two research projects where triggered to evaluate the impact of corrosion and material condition on the fatigue behavior of cast magnesium alloys , two other projects investigating the behavior of welded magnesium sheets also benefited. A further research project based on his work, evaluating the stress corrosion behavior of tension loaded magnesium alloys under environmental conditions of practical interest, is currently in progress.

**Hottinger Baldwin Messtechnik GmbH**

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