



World of Product Engineering



SPEAKER

European Technology Transfer Conference 2008: Security

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VITA

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Luft- und Raumfahrt an der TU München

Beruflicher Werdegang:

Assistent und Promotion an der **Technische Universität München**
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Seit Dez. 2002: Geschäftsführer der **HPS GmbH**
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ABSTRACT

“Developments for Space Applications: High Temperature Insulations, Electro-magnetic Shielding in CFRP and RFID-Technology”

In the frame of ESA's technology development program HPS has won around 20 contracts since 2000. Main goal was and is to prepare technology for future demands. Examples, relevant for the topics “shielding” and “safety”, and may be with potential for a technology transfer to earth, will be presented on the conference:

- I) For vehicles diving back into Earth's atmosphere, a lightweight multi-layer insulation has been developed in order to shield the load carrying aluminum structure against the 1.600°C occurring directly below the outer ceramic shingle. Also a 10-min.-protecting material, in case of a failure of these shingles, has been developed. The behavior of special ablative material has been investigated for dusty environments of Mars with heat fluxes up to 450 kW/m².
- II) Electromagnetic shielding can well be obtained by metallic structures. But in case of lightweight requirements, structures should be manufacturing out of e.g. Carbon Composites (CFRP). The shielding characteristics of many variants of CFRP, including CFRP doped with Carbon Nanotubes (CNT), has been investigated in detail. The final product was an electronic box out of CFRP on which a mass saving of 25% with similar EM-shielding capabilities compared to an aluminum housing has been achieved.
- III) More in the direction of “safety” goes the performed activities on RFID-technology: data transmission via passive chips. Examples for space applications range from logistics for the space station, over health monitoring or environmental testing of space structures, up to quality assurance measures during assembly.