Fraunhofer IWU

FRAUNHOFER INSTITUTE FOR MACHINE TOOLS AND FORMING TECHNOLOGY IWU

DEVELOPMENT OF A TECHNOLOGY FOR THE PRODUCTION OF REINFORCED ALUMINUM FOAM ABSORBERS

Susi Rybandt, Dr.-Ing. Jörg Hohlfeld, Dr.-Ing. Thomas Hipke
Fraunhofer Institute for Machine Tools and Forming Technology IWU Chemnitz

JOINT RESEARCH PROJECT

Energy absorption with HYbrid composites of DRapable materials and Aluminum foam (HYDRA)

MOTIVATION AND OBJECTIVES

Energy absorption by using hybrid composites for protecting buildings

- weight reduction with hybrid composites (lightweight solutions)
- high energy absorption
- design of protective devices with equal or improved properties (esp. energy absorption capability) compared to existing systems

Results

- development of 2D and 3D reinforcement structures made of various materials (woven fabrics, knitted or crocheted fabrics)
- development of hybrid sandwich structures (semi-finished products)
- development of energy absorption devices by using innovative hybrid materials (curtain-wall facades, supporting element protections, mobile blast protections)
- implementation of three demonstrators with various 3D spacer structures as reinforcement layer

PARTNERS

- Drahtweberei Pausa GmbH
- Sächsisches Textilforschungsinstitut e. V.
- SMK Ingenieure GmbH & Co. KG

RESULTS

Figure 1: Mobile blast protection

Figure 2: Curtain-wall facade

Figure 3: Protection of supporting elements

Federal Ministry for Economic Affairs and Energy

Founded by Federal Ministry for Economic Affairs and Energy between 09/2013 and 08/2016