HybTech

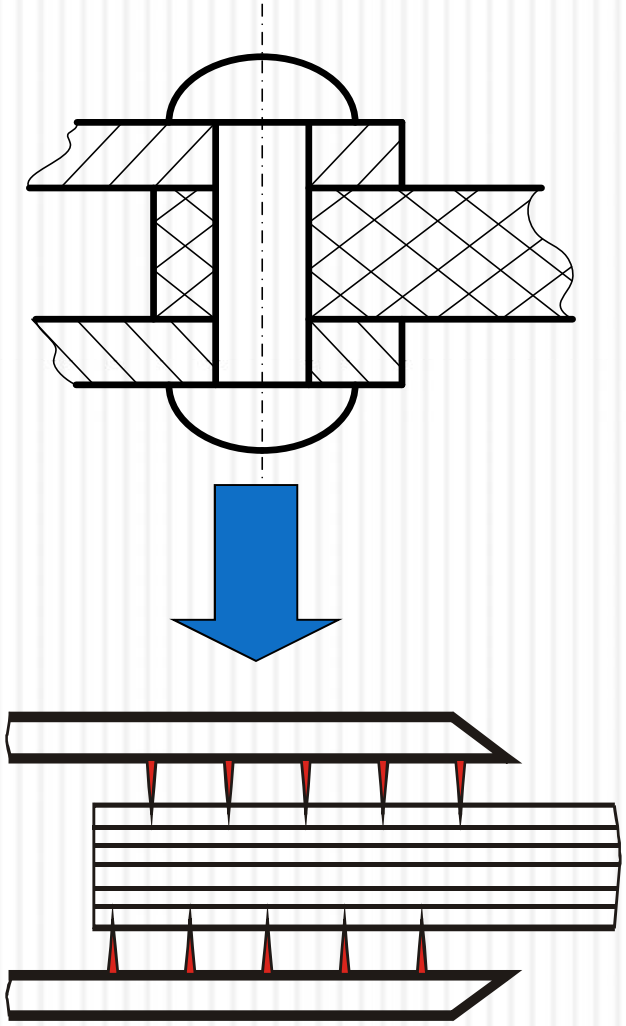
Industrial Composite-to-Metal Hybrid Joining Technology

FoF 12 – 2015: Industrial technologies for advanced joining and assembly processes of multi-materials

Project aim & basic idea

- **Project focus**: multi-material metal-to-composite primary/secondary structures
- **Project motivation**: to overcome the limitations of traditional mechanical and adhesive joints
- **Project aim**: to develop novel Hybrid Joining technology and bring it to the industrial level
- **Expected impact**: improvement of multi-material structures performances, functionality & cost efficiency
- **Technology markets:** multi-sectoral applicability (aviation, automotive, chemical, energy, etc.)

HybTech: Radical solution for multi-material structures

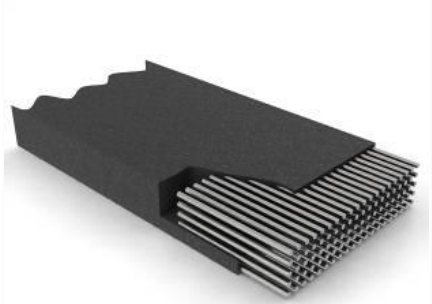
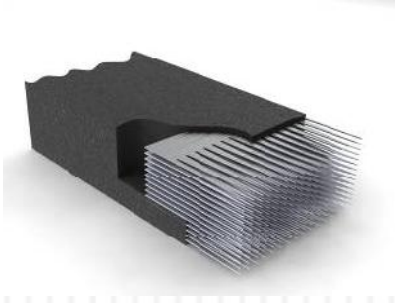
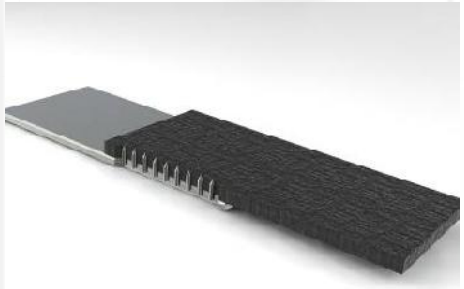
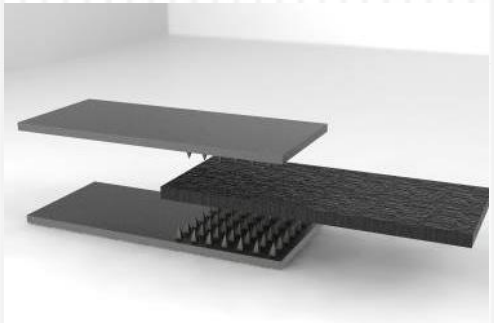
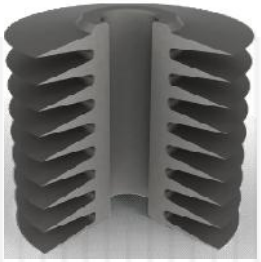


Hybrid joint benefits:

- Fibres integrity
- High load-carrying capacity
- Increased strength-to-weight ratio
- Less labour efforts for assembling

Basic types of hybrid joints

- Longitudinal
- Transversal
- Semi-loop


Applicable for thermoset & thermoplastic composites

Project innovation challenges

- Hybrid joints design / FEM-simulation / optimization
- Cost/time-efficient industrial process(-es) development
- Appropriate NDI methods/equipment development
- Proof-of-concept prototype manufacturing and testing
- Hybrid joining technology validation
- Technology efficiency assessment in relevant environment

Targeted TRL 5-7

Project concept / methodology

“Case Study”- based approach

- CASE STUDY 1 - Aeronautical application
- CASE STUDY 2 - Automotive application
- CASE STUDY 3 - Consumer goods application

CASE STUDIES will be selected by
respective END USERS
at the proposal preparation stage

Outcome & Impact

Proven production process for efficient multi-material metal-composite components design with:

- 20% less of material consumption and structural weight
- 30% higher load-carrying capacity of integral structure
- 30% less production time
- 40% lower production costs
- High level of process automation

Partners invited

- Coordinator
- Aeronautic Tier 1
- Automotive Tier 1
- Consumer goods manufacturer
- Composite structures designer/manufacturer
- Composite production equipment manufacturer
- Metal parts designer/manufacturer
- NDI expert

KhAI: 30-years experience in hybrid joints

- Design
- Optimization
- Manufacturing
- Testing
- Standardization

National Aerospace University "KhAI", Ukraine

National Aerospace University “KhAI”

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