
Elevator pitch

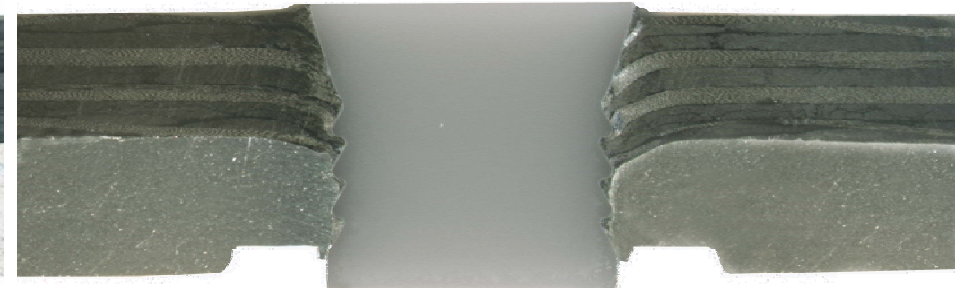
Joining fiber-metal-structures with ceramic-rivets

CORNET-meeting
29.11.2011 IWU Dresden

- Problem
- Preliminary work
- Goal of the project
- Looking for Partners



Steel-rivet

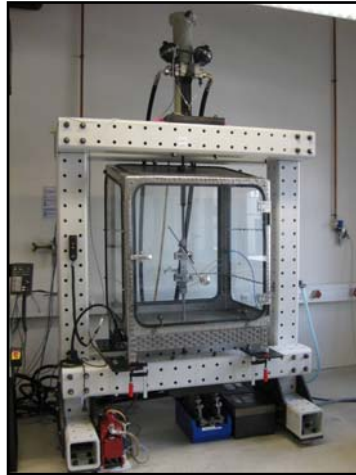


Ceramic-rivet

Problem

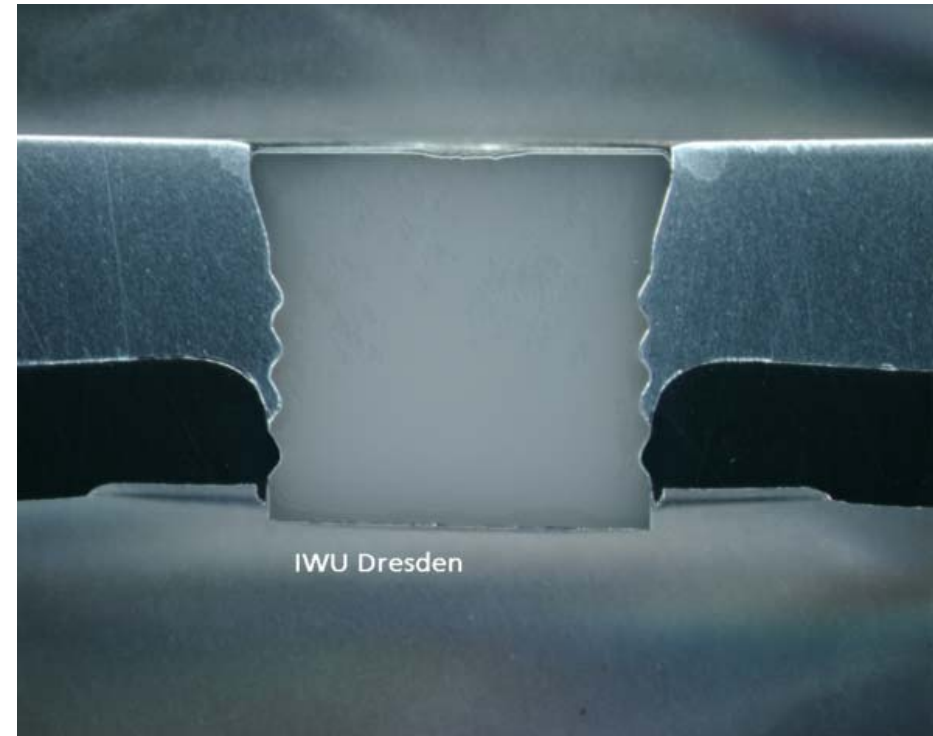
Ceramic-rivets in fiber-metal-structures

- **Joining carbon fiber and metal (aluminum or iron alloy) is a risk of galvanic corrosion**



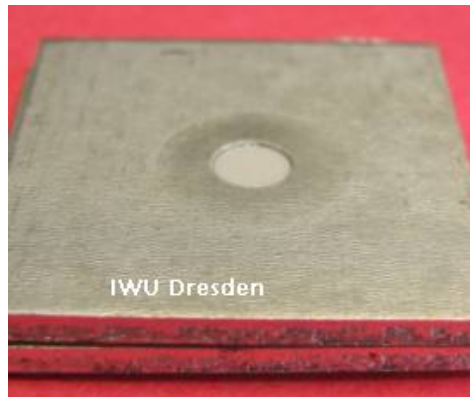
- **Axial preload of the rivet after setting leads to tensile stresses in the head area**

Example for multi range ceramic rivet

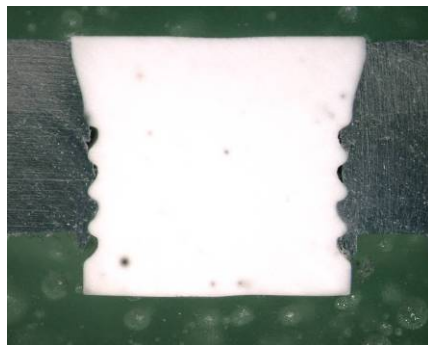


Preliminary work

Ceramic-rivets in fiber-metal-structures

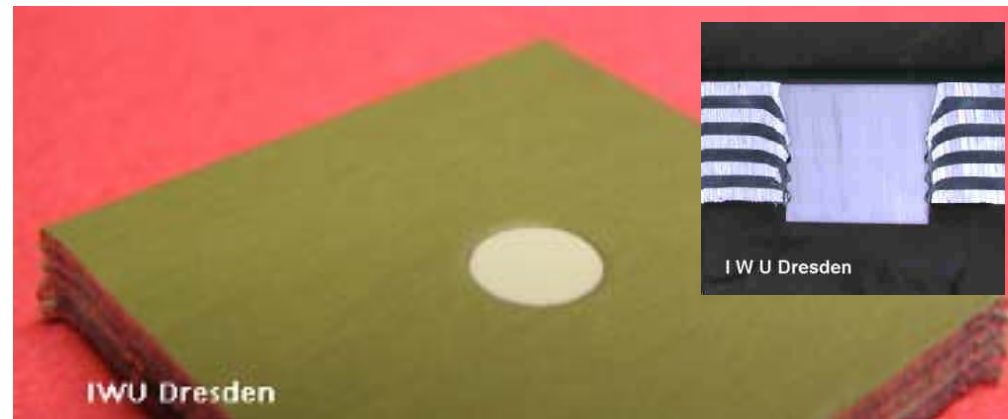


Mg/Mg



Alu/Alu

Realized material combinations



GLARE – Ceramic

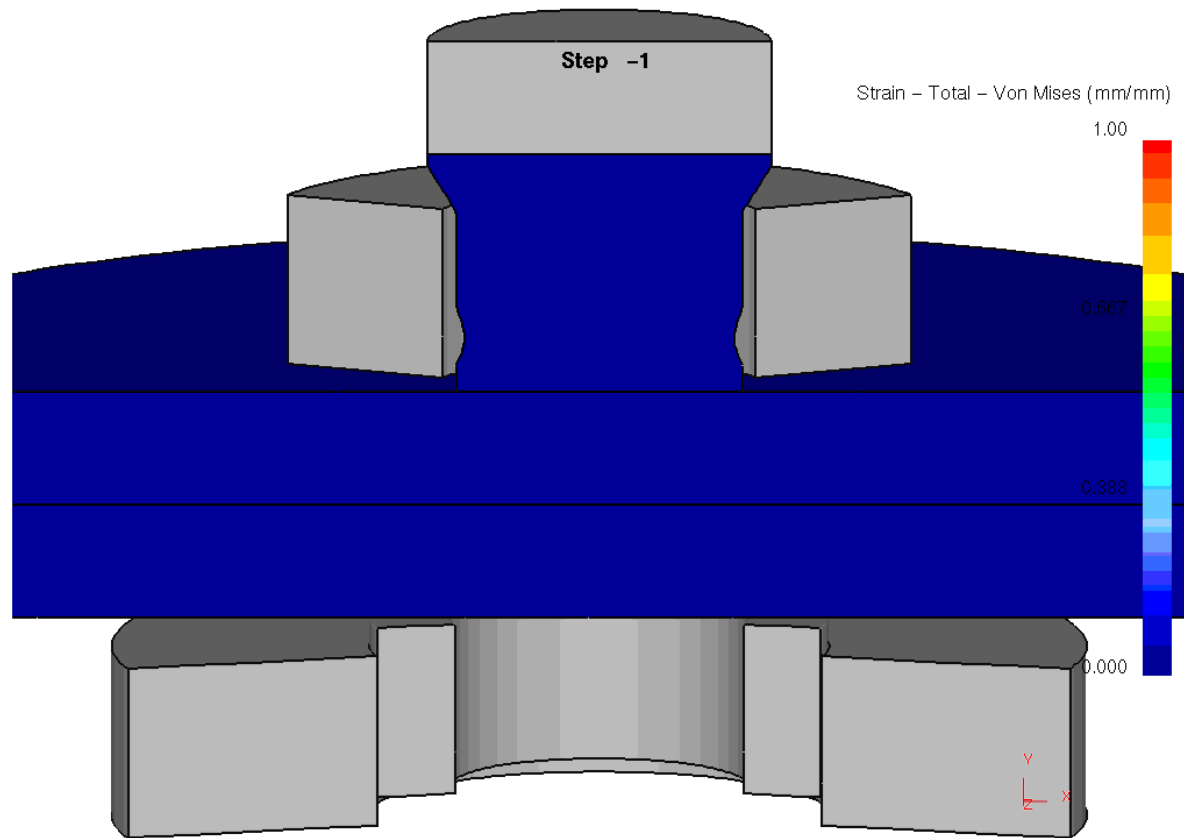
Development of new rivet geometries for selected material combinations

- ⇒ Test for selected material combinations new rivet geometries
- ⇒ Investigation of suitable ceramics with tensile-stress-performance
- ⇒ low-cost manufacturing processes (tool design and construction of injection molding process)
- ⇒ Evaluation of joint result with quasi-static and cyclic strength tests
- ⇒ Optimization of the rivet and the joint connection
- ⇒ Corrosion tests

Looking for partnership and support

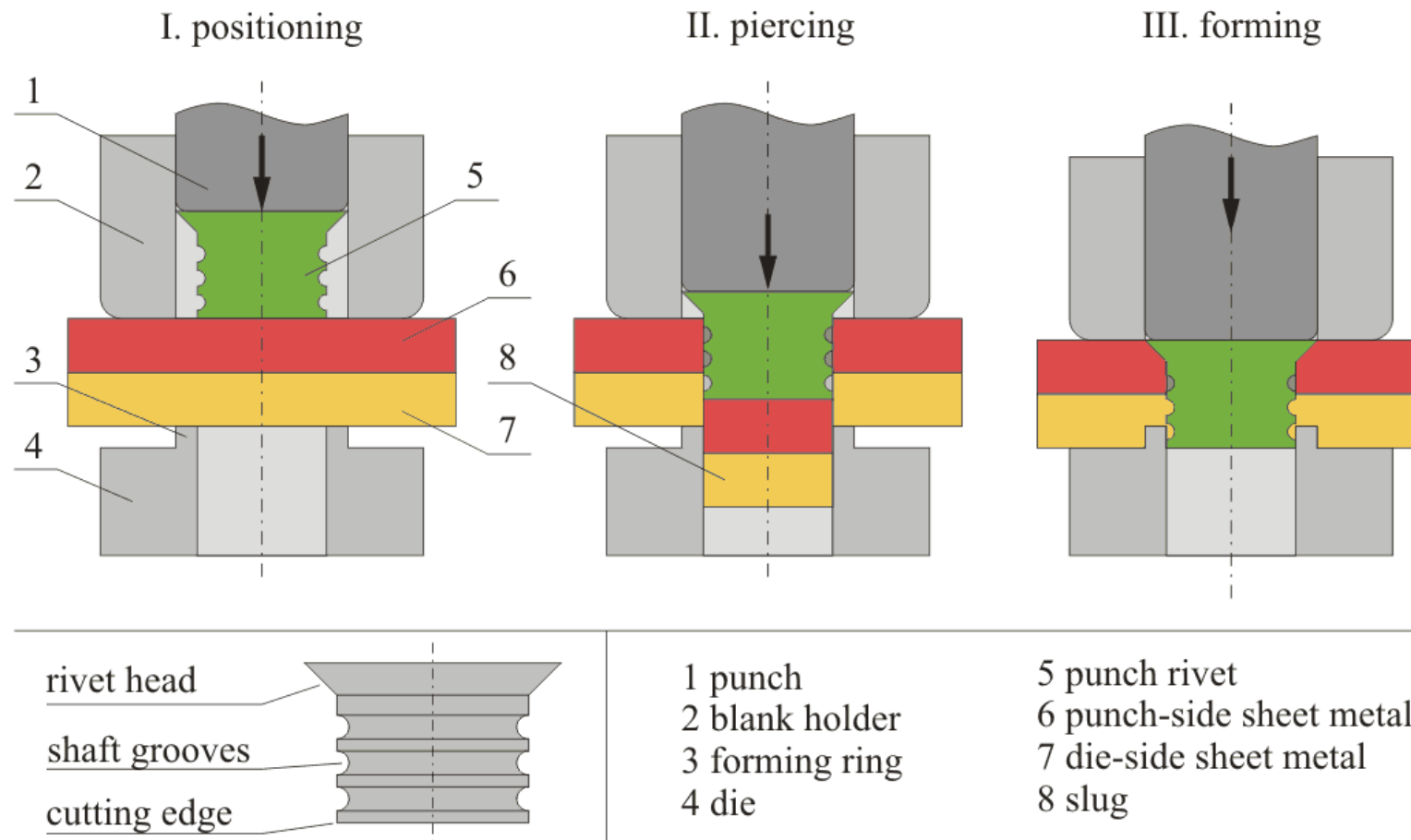
- ⇒ Examination of necessary applications - automobile and aviation
- ⇒ Provide material – specifically carbon fibre
- ⇒ Computation of carbon fibre structures
- ⇒ Development of new ceramics with low-cost manufacturing - injection molding process
- ⇒ Corrosion tests

Ceramic-rivets in fiber-metal-structures



Process animation – joining with self piercing solid rivets

Ceramic-rivets in fiber-metal-structures



Process steps – joining with self piercing solid rivets (schematic)