WCM Research & Innovation

ManuFuture's EUROPEAN JOINING PLATFORM
Industrial priorities on challenges in joining

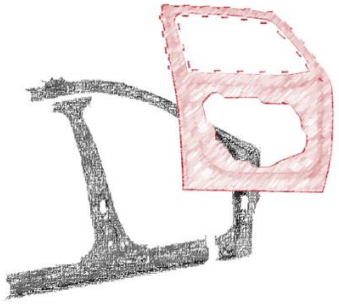
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Joining of crack susceptible and highly alloyed materials

- **Aluminum body in white and hang-on parts for high volume production:**
  - Lightweight structure with progressive steel substitution with lighter materials like aluminum, magnesium and plastic composites
  - Need to keep same volume production, joint performance and cost
    - Current intensive steel BiW and hang-on based on RLW
    - Current aluminium hang-on parts based on Laser Welding with filler material



RLW



Steel based



LW with filler



Aluminium based



RLW

Aluminum crack sensitivities
Edge distance influence



Aluminium based

Dissimilar material joining

- **Multimaterial joints**
  - Light alloy to steel (e.g. aluminum roof to steel sides …)
    - Different approaches (welding, brazing…) but which behavior vs thermal dilatation (EK process) ?
    - Fatigue behavior?
    - Corrosion resistance?
    - New MPW generation with compact system for mass production (hang-on or BiW) ?
  - Plastic reinforced to steel
    - Steel (or aluminum) laser texturing to prepare plastic adhesion, but again, which behavior vs thermal dilatation (normal BiW environment) ?

- **New materials introduction with enhanced and tailored properties, specific strength, multiple sheets**
  - High volume production joining solution with process control for tailored properties materials (e.g. boron steel with softened zone, multi-thickness/Multi-materials layers, …)