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Fiat Panda body-in-white with integrated roof stiffener

Multi-material demonstrator part

Microsection of the joint – Form fit between laser-textured metal and TP-FRPC

Motivation:
An innovative material mix is the future having the right material at the right spot to realize efficient lightweight design solutions

Approach:
Weight reduction through hybrid structures made of fiber reinforced thermoplastic composite (TP-FRPC) and metal, without additives

Challenge:
Joining metal with TP-FRPC suitable for mass production

FlexHyJoin solution:
Complementary laser and induction joining technologies combined with laser surface texturing and non-destructive testing in a fully automated prototype production cell

Infrared images of non-destructive testing with Lock-in Thermography

Defect-free joining area

Artificial defect in joining area in form of a void

Thermoforming of FRPC part
Punching of metal parts

Induction joining
Laser surface texturing
Non-destructive testing
Laser joining
Integration of joined components in main assembly