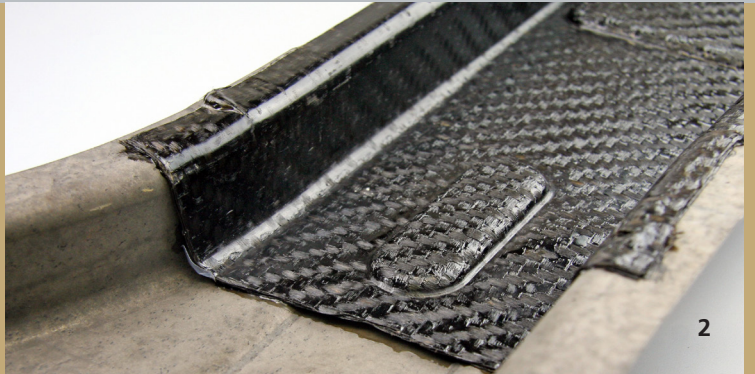




1



2

1 Formed FRP patch

2 Patched part

LOCAL REINFORCEMENT OF METAL STRUCTURES BY FRP PATCHES

Objective

Today's car body manufacturing is characterized by metal-intensive construction methods for sheet metal and profiles. A pure material substitution by fiber-reinforced plastics has so far hardly been feasible economically.

The pursuit of hybrid structural approaches according to the principle "the right material in the right place" represents a promising approach for the realization of affordable lightweight structures with high performance potential. Hybrid structures made of metals and fiber-plastic composites (FRP) are economically competitive if the high-priced FRP is only used locally to reinforce highly stressed areas.

This type of material hybridization has already been known for several years under the term "patching".

Innovation

Essential criteria for the successful use of FRP patches are requirement-compliant, reproducible joints in combination with an economical joining technology as well as knowledge of material properties and failure behavior. These topics have been comprehensively worked on at Fraunhofer IWU.

Features of patch technology

- Component-dependent sheet thickness reduction of 30 to 50%
- Local stiffening by PA6/GFRP patches
- Potential for mass reduction between 25 and 30%
- Improvement in the eigenmodes of torsion and bending
- Thermal direct joining or gluing process possible

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