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Research Area 3: Advanced Materials Joining

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3. Advanced Multi-Materials Joining

Lightweight materials have unique set of properties and provide the ultimate solution to superior fuel efficiency. However, the biggest challenge is how to join them with traditional dissimilar materials such as steel, aluminum, and magnesium.

This research activity mainly focuses on tailorable self-sensing “active” adhesives and hybrid joining systems for use in the joining of similar and dissimilar materials in vehicle application. Related topics such as material selection, interface interaction, interaction of active materials with electromagnetic field, self-sensing joints, and influence of environmental and mechanical loadings on the performance of the resulting joints will be studied to develop experimentally validated numerical models. The multi-material joining includes, but not limited, fiber reinforced composites, polymers, foams, and metallic material such as Aluminum and Steel.

