High Rate Test Methods for Fiber-Matrix Interface

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How We Fit

Materials-by-Design Process

Mechanism-based Approach

Key Goals

- S2 Glass Fiber
- DER353 epoxy resin with silane sizing

Key Accomplishments

Characterization of fiber-matrix interface properties over six decades of loading rates

Major Results

- Characterization of fiber-matrix interface properties over six decades of loading rates
- Novel Kolsky bar technique for interface characterization at high rate of loading

Technical Approach

Finite Element Analysis for specimen design

Key Goals

- S2 Glass Fiber
- DER353 epoxy resin with silane sizing

Future Directions in 2017

- Visualization of damage in interphase (Argonne National Lab)
- Characterization of resin system developed at Drexel University

Impact

- Improved understanding of energy absorbing mechanisms will have broad applications in composites
- Critical element of materials-by-design framework for composite materials under high rate loading
- Will lead to improved protection materials while decreasing the cost and time for development of new lightweight energy absorbing composite materials