Fabrication and Cyclic Loading of Super-elastic Shape Memory Alloy Reinforced Polymer

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Vocabulary

• What is an FRP?
• What are Super-elastic SMA wires?
• What is a SMA-FRP?
• How does SMA-FRP differ from conventional FRP?
Objectives

• This study explores the tensile behavior of SMA-FRP specimens fabricated by a modified hand lay-up technique, and observes how different diameters of wire alter the performance of the specimen.
Fabricating Composites

- Two batches of specimen: 0.5 mm and 0.7 mm
- The fiber volume ratio was 10% for each specimen
Testing Setup
“Debonding”
Sources of error
Results

Phase I

Phase II

Phase III

Failure @ 10.3% strain

Permanent deformations

Accumulation of plastic deformations

@ 8.0% strain

Full recovery @ 6.8% strain

Stress (MPa)

Strain (%)
Questions?

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