

Industry Feedback: Session III

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A. Durability of Adhesively Bonded Aerospace Structure

- Understand *relative* load levels associated with four types of crack growth (or residual strain); static, fatigue, creep, ratcheting.
 - What is the load levels of the various durability load types that will cause equivalent damage to the baseline static load? (i.e. what type of durability loading is most critical?)
 - Do the results suggest a revised testing protocol for new adhesive bonding systems?
- Understand the significant reduction associated with R=-1; was it a crack tip plasticity effect or buckling?
 - Do the results suggest we need to be concerned about overloads or high cycle truncation for materials that exhibit higher plasticity relative to semi-brittle thermoset composites?

B. Evaluation of Notch Sensitivity of Composite Sandwich Structures

- Facesheet thickness and failure mode effects will challenge measurement of consistent fracture toughness values that will meet similitude conditions. Is there additional modeling that may allow us to expand limited test data to cover variation in facesheet thickness, core thickness, core density, mode of failure, etc.
- What is the influence of the mode of failure on measured toughness? (e.g. core fracture, core pullout, cohesive failure in the adhesive, cohesive failure in the facesheet).
- Perform validation of measured properties by correlating analytic predictions with test results.

C. Effects of Moisture Diffusion in Sandwich Composites

- Explain the physics of moisture influence on failure?