Analytical Software Validation for Composite Technology

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Composites

- 2+ constituent materials combined macroscopically
- Constituents remain distinct in the final material
- Inherit many of the better traits of each material
- Lamina vs. Laminate
Testing Material Properties

**Coupon Production**
- V-Notch Shear
- Compression
- Tension

**Strain Gaging**
- Gage Selection
- Applying Gages
- Tracking Strain

**Stress Testing**
- Testing Setup
- Data Collection
- Property Calculations
Testing Setup

Tension

Compression

V-Notch Shear
Constituent Testing

- Single-Fiber (IM7 Fiber)
- Neat Resin (HEXCEL-8552)
DIGIMAT – Property Predictions

- Many different tools available

- Digimat – Virtual Allowable (VA)
  - User inputs testing criteria
  - Digimat runs virtual tests and returns properties
Criteria Input

- Materials
- Layup
- Tests
- Environment
Criteria Input (Cont)

- Variability
- Creating a database
Data Collection

- Timelapse of stress
- Strength by coupon
- Stress vs. Strain Analysis
Benefits of Using Digimat

• Design the perfect composite

• Reduce testing requirements

• Faster and cheaper
Special Thanks
Questions