

Test Methods for Composite Materials

DAY 1

Introduction to Composite Materials Testing

- ❖ Stress-Strain Relations for Anisotropic Materials
- ❖ Material Properties to be Measured

Laminate Orientation Codes

Typical Experimental Data

Proper Interpretation of Test Results

Available Test Methods

Governing Standards and Their Use

Test Specimen Preparation and Inspection

- ❖ Specimen Cutting Equipment, Tabbing Methods
- ❖ Tabbing Materials and Geometries, Adhesives
- ❖ Specimen Conditioning

Types of Testing Equipment Commonly Used

Strain Measuring Instrumentation

Static Tensile Testing

- ❖ Specimen Sizes and Configurations
- ❖ Standards and Their Variations
- ❖ Helpful Testing Tips

Static Compression Testing

- ❖ Types of Load Application and Corresponding Fixtures
- ❖ Typical Test Results and Potential Problems
- ❖ Selection of a Standard Test Method
- ❖ Specific Purpose Test Methods

DAY 2

Flexure Test Methods

- ❖ Three- vs. Four-Point Flexure, Quarter- vs. Third-Point Loading
- ❖ Support Span Length-to-Specimen Thickness Ratio
- ❖ Loading/Support Cylinder Diameters

Shear Test Methods

- ❖ In-Plane vs. Interlaminar Shear
- ❖ Evaluation of Available Test Methods
- ❖ Typical Test Results

Biaxial and Triaxial Loading – Verification of Failure Criteria

Fracture Toughness Testing

- ❖ Fracture Modes I, II, III, and Mixed Mode
- ❖ Commonly Used Test Methods

Fatigue , Impact, and Creep Testing

- ❖ Special Equipment and Data Acquisition

Testing of Single Fibers, the Matrix, and the Interface

- ❖ Specimen Preparation
- ❖ Loading Techniques
- ❖ Micromechanical Relations to Composite Properties

Physical Properties Testing of Composites

- ❖ Fiber and Void Volume Contents
- ❖ Thermal Expansion
- ❖ Moisture Expansion

All information is subject to change