

PU 106: Introduction to Composites

Introduction to Composites

- What is a Composite and Where Do Composites Fit?
- History of Composites
- General Classification of Composites (Continuous vs. Discontinuous Fibers)
- General Composite Applications
- Advantages / Disadvantages of Composites
- Strategy When Using Composites
- Main markets

Resin Technology

- Introduction to Resins
- Thermoset vs. Thermoplastic
- Overview of Thermoplastics
- Overview of Thermosets
- Detailed Thermosets Information
 - Polyesters
 - Vinyl Esters
 - Epoxies (base + hardener discussion)
 - Polyurethanes
 - Phenolics
 - Others
- Resin Selection Guidance
- Example Formulations

Filler/Fiber Technology

- Introduction to Fillers/Fibers
- Continuous Fibers vs. Discontinuous Fibers
- Fiber Type Comparison
- Textile Forms and Architecture
- Fiber/Matrix Interface
- Fiber Sizing

Manufacturing Processes

- Cycle Times
- Impregnate and Form (PU/resins)
- Place and Form – Thermoset Compression Molding

Manufacturing Equipment

- Dosing Units
- Mixing Heads
- Presses, Performers, and Molds

Recycling and Circular Economy

- EU Regulation
- Recycling Carbon Fiber