Course M-5
Resin Infusion Technologies

Course Summary

This course is designed for the engineer, technician, laminator, fabricator, or anyone else wanting to learn about the fundamental principles and more complex concepts involved in resin infusion technology.

Introduction

Previous experience with composite materials, layup, and vacuum bag processing is required. For those who do not have a thorough background with advanced composite layup and processing, we recommend our *M1/R-1 Composite Structures: Fabrication & Damage Repair-Phase 1* course as a prerequisite course prior to attending the resin infusion course.

The fundamental science that drives vacuum infusion processing (VIP) is explained and tested in the workshop. Materials, tooling and application techniques are evaluated and applied with hands-on exercises and demonstrations. Students will gain a theoretical understanding and practical hands-on experience necessary to employ vacuum resin infusion in their own applications.

This course will examine the pros and cons of infusion processing and define the usefulness and limitations related to the VIP process. The class includes a basic overview of the necessary facilities and equipment required to set up and perform VIP in a production setting.

Topics

Key Lecture Topics:

- Overview of infusion techniques.
- Fiber forms and material types used for infusion.
- Specialty cores and fabrics.
- Resins used for infusion.
- Temperature, viscosity and permeability; Darcy's Law.
- Flow fronts; principles and designs.
- Race-tracking and other inherent problems.
- Resin feeder and vacuum systems.
- Resin/fiber calculations.
- Facilities, tools and equipment.

Workshop Exercises:

- Fiber-pack/preform fabrication.
- Placing and securing fibers/fabrics in molds.
- Tool preparation and mold release application.
- Installation of resin and vacuum plumbing. Vacuum bagging for infusion.
- Infusion exercises involving various shapes.
- Solving infusion problems.
- Identifying leaks and dry areas.
- In-process repairs of dry areas.
- Curing infused panels and parts.

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Course Benefits

The student will learn the fundamental principles of resin infusion processing with emphasis on vacuum infusion technologies.

Prerequisites

M-1/R-1 Advanced Composite Structures: Fabrication and Damage Repair - Phase 1, or

Equivalent (5 year min) experience with advanced composite materials and processes.

(*Please contact Abaris for equivalency test criteria and evaluation.)

Teaching Method

Active classroom lecture and workshop exercises: 20% Theory and 80% Practical

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