

Course M-3 Advanced Composite Manufacturing 3

Course Summary

This course is designed as follow-on to the M-2 (Manufacturing 2) course and is intended for those wanting to further their knowledge of composite manufacturing, whether in preparation for employment in the advanced composite manufacturing industry, or as engineers or technicians desiring a further understanding of the practical skills involved in producing quality composite structures.

Introduction

At the end of Manufacturing 3 the student will have an intermediate level knowledge of machining, trimming and drilling composite components using fixtures, surface preparation methods/secondary bonding of structures, component assembly methods and techniques, as well as a acquire a fundamental knowledge of the resin vacuum infusion manufacturing process.

Topics

Key Lecture Topics:

- Documentation of in-process and post-process operations.
- Rejection reports, cause and corrective actions.
- Machining, trimming, and drilling composite components.
- Surface preparation and adhesive bonding of composites Vs metals.
- Mechanical fastening methods and techniques.
- Composite structure assembly methods and procedures.
- Resin infusion processes: Vacuum Infusion Process (VIP), Resin Transfer Molding (RTM), Vacuum Assisted Resin Transfer Molding (VARTM), etc.
- Darcy's law/permeability discussion.
- Resin ingress vacuum egress plumbing design.

Workshop Exercises:

- Trim and drill components for assembly using Trim and Drill Fixtures (TDF).
- Surface preparation and bond-assembly of components.
- Installation of bonded nutplates and inserts.
- Prepare mold for infusion layup process.
- Layup preforms, arrange inlet and vacuum plumbing, vacuum bag, and infuse panel.
- Inspect all panels and assemblies and document findings.

Course Benefits

At the end of Manufacturing 3 the student will have an intermediate level knowledge of machining, trimming, drilling and bonding composite components for assembly. Students will complete an assembled structure.

Prerequisites

M-2 Advanced Composite Manufacturing 2

Teaching Method

Active classroom lecture and workshop exercises

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