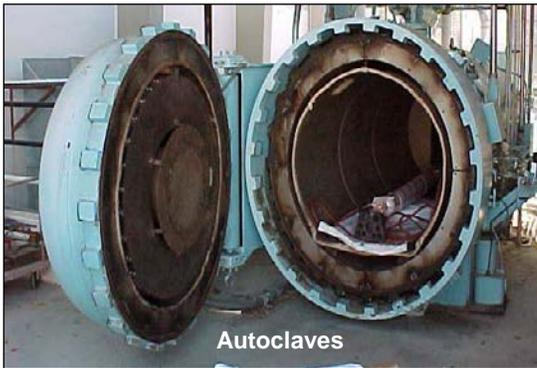
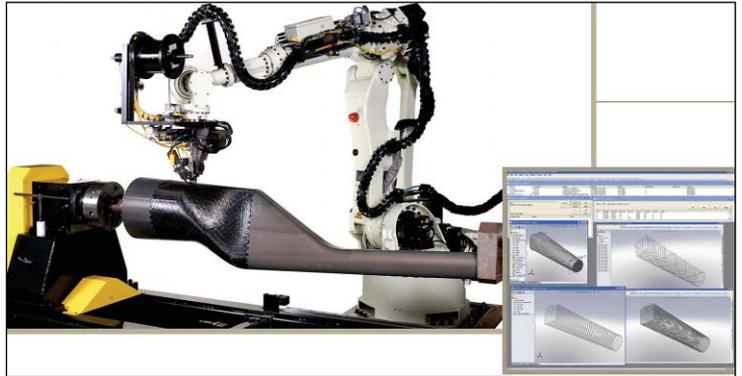


Mission. Deliver high-quality, cost-effective composite solutions supporting military contingency operations worldwide.

Unique Features. Premier U.S. Navy integrated composite design and fabrication center delivering non-metallic products to the DoD / joint service clients.

- The Composites Laboratory has state-of-the-art manufacturing facilities equivalent to those in the aerospace and defense industries
- Wealth of prototyping and manufacturing experience



Cost / Time Savings. The Composite Shop specializes in quick-turnaround prototype development for composite and plastic parts. Tasking includes designs, tooling, and fabrication development.

RDT&E. The shop provides full spectrum capability covering the entire fiber family (continuous, chopped, fabric) as well as the entire resin family (thermosets [epoxies and polyamids] to thermoplastics). The laboratory provides an essential capability program support in material and process selection, validation, and characterization. Materials supported include polymer matrix composites, metal-matrix composites, rubber-based insulators, phenolic ablatives, and adhesives.

Types of Service

- **Fabrication.** Produce parts with aerospace industry standard methods and materials. Experience in filament wound structures such as rocket motor cases and bombs. Experience in latest layup techniques for sandwich panels, radomes, UAVs, rocket motor insulators, and antennas. Compression molding of parts such as rocket nozzles, sheet molded inlets, missile handling covers, and rocket motor insulators.
- **Parts Development.** Composite fiber-reinforced parts include bulkheads, complete airframes and nozzles, liners and insulators, and rocket-motor cases.
- **Design.** Unique design, analysis, and fabrication are integrated for quick-turnaround projects and one-of-a-kind solutions.
- **Technical Expertise.** Staff of engineers and technicians with decades of experience in composites manufacturing, adhesive bonding, and rocket motor insulation. Provide programmatic support for development and manufacturing of composite solutions.
- **Education.** Conduct lectures on composites materials, design, manufacturing, and inspection.

Size / Scope. 14,000 SF. Located at China Lake. **Year Opened:** 1989.



Equipment

- **Two Filament Winders**
 - High-speed payout of precisely located continuous fiber reinforcements
 - Fabricates solid rocket-motor cases and complete airframes for tactical missiles up to 48 inches in diameter and 16 feet long
- **Fiber Placement Machine**
 - Fabrication equipment using a numerically controlled head to precisely place rows of material onto a tool
 - 4-foot diameter x 10-foot long and 5,000-pound tool capability
- **Two Autoclaves**
 - Computer-controlled pressure ovens that cure composite structures
 - Capacity: 25 feet long x 5 feet diameter and 10 feet long x 3 feet diameter
 - 250 to 350 pounds per square inch (psi) and 650 to 750°F
- **Four Curing Ovens**
 - Cures composite components or structures under heat and vacuum, 300 to 600°F
- **Three Heated Platen Presses**
 - 350-ton capacity, up to 600°F
 - Enables compression molding of structures such as rocket nozzles
- **Class 100,000 Clean Room**
 - Aerospace standard clean room for contaminant-free operations such as adhesive bonding
- **Computer Controlled Cutting Table**
 - Reduces cycle time by generating part preforms prior to fabrication
- **Ultrasonic Nondestructive Inspection (UT NDI)**
 - Equipment identifies defects using reflected ultrasound waves
- **Coordinate Measuring Machine (CMM)**
 - Computerized arm that knows its spatial location. Excellent for reverse engineering and quality control.
- **Vacuum-Assisted Resin Transfer Molding (VARTM)**
 - Catalyzed thermosetting resin is pulled into a matched mold that has been charged with a fiber reinforced preform

