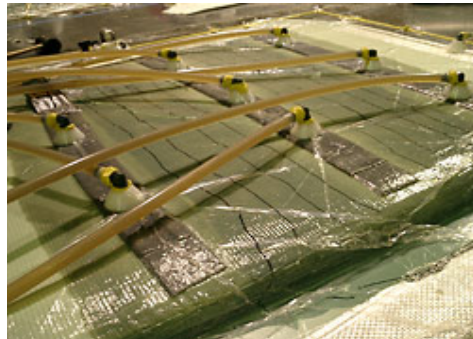


CNST Awards Project to Improve Resin Infusion Process for Large Composite Ship Structures

The Center for Naval Shipbuilding Technology (CNST), through its partnership with the Office of Naval Research and Navy ManTech recently awarded an \$870K project to Northrop Grumman Ship Systems (NGSS) to develop a predictable and repeatable resin infusion process for fabricating carbon/vinyl ester composite structures.

NGSS designs, constructs, and outfits vessels for the U.S. Navy that include a number of components constructed of composite materials. While these structures improve performance of the Navy's steel-hulled ships, the infusion process for first-time production articles is largely variable and results in excess material/labor costs and schedule interruptions. This issue will be critically important during construction of the ZUMWALT-Class destroyer (DDG-1000) whose entire deckhouse will be made from composite materials. Advances in computer technology have led to commercially available software packages (e.g., Liquid Injection Molding Software) that can assist engineers and planners in developing instructions for the set-up and infusion process that will generate high quality parts with little or no rework or wasted material.

This twelve-month, "first-time quality" initiative will employ a "design of experiments" methodology and leverage resources from Navy ManTech's Composites Manufacturing Technology Center, the NGSS Composites Center of Excellence, and the University of Delaware-Center for Composite Materials industry consortium. Upon successful implementation, these smart manufacturing methods will provide engineers greater control over resin distribution, tooling and handling, and injection port location. Material savings alone are estimated at \$1.7M per hull; significant labor costs avoidances for set-up, quality assurance, and rework will also be realized. The resin flow modeling technology will be implemented at NGSS Gulfport Operations facility.



Left and Center: Examples of composite structures during the resin infusion process.

About CNST

CNST is a Navy ManTech Center of Excellence, chartered by the Office of Naval Research (ONR) to identify, develop and deploy, in U.S. shipyards, advanced manufacturing technologies that will reduce the cost and time to build and repair Navy ships. For additional information on this and other CNST projects, please visit www.cnst.us.