

Knowledge & Process Tools for Manufacturing of Affordable Composites – Ground Vehicles Systems and Common Technologies

PROBLEM / OBJECTIVE

The Army is rapidly transforming into a lighter, more lethal “system of systems” and as such will require a new generation of materials (and combination of materials) to meet these unprecedented requirements. Polymer-based composite materials are key to enabling new levels of performance.

The objective of this effort was to develop both generic and specific process technologies that would address critical issues associated with the scale-up and successful implementation fabrication methods in an actual manufacturing environment.

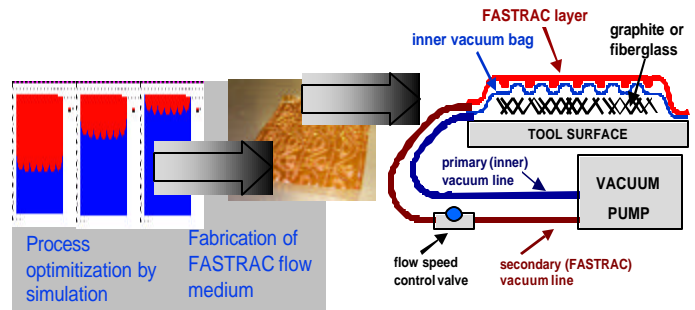
ACCOMPLISHMENTS / PAYOFF

Process Improvement:

FASTRAC (Fast Remotely Actuated Channeling) is a technology invented and patented by ARL that enables a mass-production of composite structures with a reduction in both waste and labor compared to conventional Vacuum Assisted Resin Transfer Molding (VARTM) composite technology. COMPOSE software provides a powerful, user-friendly virtual environment to rapidly optimize resin impregnation of both thin and thick composite structures.

Implementation and Technology Transfer:

FASTRAC was demonstrated in an actual manufacturing operation in conjunction with United Defense LP (San Jose, CA.) and AASC Inc., of Stockton, CA. The demonstration was part of an integrated effort to produce structural armor modules using an array of ManTech sponsored technologies, including near-net performing, sensor-based computer controlled resin infusion, and near-net ceramic tile array placement. This project successfully demonstrated the ability to develop, implement, and operate a composite manufacturing cell with minimum labor and a high level of control over the process and the quality of the resulting product. This project has achieved a broad range of recognition, as well as awards for both the hardware and software developed under this program.



Expected Benefits:

This technology has already demonstrated a 30-40% reduction in both labor and waste. The manufacturing cell technology has been identified as a critical element for scaling up Future Combat System (FCS) composite material production. Sikorsky actively uses the COMPOSE process simulation environment developed under this program.

TIME LINE / MILESTONE

Start Date	January 1999
End Date	January 2004

FUNDING

Army ManTech	\$10.1M
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PARTICIPANTS

Sikorsky
 United Defense
 University of Delaware
 Solectria Inc.
 CoorsTek Inc.
 AASC Inc.
 Boeing
 Government: ARL, AMRDEC, TARDEC, ARDEC