

COMPOSITE TECH BRIEF

SMART MOLDING

UD-CCM's SMARTMolding takes the control out of the operator's hands. The system, based on software and hardware components, guides an operator through the material lay-up, infusion and cure process for Vacuum-Assisted Resin Transfer Molding (VARTM). This allows intelligent process control (IPC), repeat manufacturing and full quality assurance/quality control (QA/QC) of the process.

At the material lay-up station, the

technician is prompted to put barcoded materials into the mold in the correct order. Information, such as operator, cycle time for each handling step, and barcode information, is stored in a QC database.

BENEFITS OF SMART MOLDING

- ◆ Incoming material traceability is achieved
- ◆ Infusion automation enables repeat manufacturing
- ◆ The IPC is production-ready

The infusion station includes: valves for on/off flow control of infusion lines, variable vacuum control, tool-mounted sensors, flow rate monitoring and temperature control of heated tooling. The software enables operator login, automated leak check, automated resin mixing, and automated infusion of large-scale and thick-section composite parts. All process variables and sensor information are stored in the QC database.

A production queue, connected plant-wide through an Intranet, enables the supervisor to add/delete parts into the process and monitor their progress. The IPC system allows plant-wide operation of multiple stations at several locations.



COMPOSITE TECH BRIEF

BETA-SITE TECHNOLOGY TRANSITION

SMARTMolding has been demonstrated in the industrial beta sites shown here. SMARTMolding was developed as part of UD-CCM's Office of Naval Research (ONR) program in conjunction with a DURIP equipment grant.



Using UD-CCM's SMARTMolding technology, United Defense LP was able to completely automate the infusion process for the production of integral armor for the U.S. Army's Crusader (left) and the new Future Combat System-Wheeled Vehicle (FCS-W).



TECHNICAL CONTACT:

Dr. Dirk Heider

phone: 302.831.8898

fax: 302.831.8525

heider@ccm.udel.edu

