PROJECT OBJECTIVES

- Measure change in preform thickness due to cyclic compression using Smartmolding System.
- Vacuum debulking used to compact dry preform prior to infusion during VARTM process.
- Evaluate the effect the debulking cycle has on FVF for different fabrics and fabric architectures.
- What effect does higher FVF have on penetration resistance of the composite?
- Experiments were repeated with 54 and 96 oz. E-Glass, and 211 oz. S-Glass 3D weaves.

EXPERIMENT SETUP

- Preform Characteristics:
  - Fiber: 54 oz. E-Glass
  - # of Plies: 4
  - Size: 1' x 1' square
- Displacement measured with Linear Variable Displacement Transducer (LVDT), Smartmolding System, and LabVIEW software.
  - 5" Hg low vacuum level
  - 20 second low vacuum dwell time
  - 30" Hg high vacuum level
  - 30 second high vacuum dwell time
- Cycle runs until preform compaction reaches asymptotic steady-state

RESULTS

Relative Thickness Reduction vs. Fabric Weight for 4 Plies of Fabric

FUTURE EXPERIMENTS

- Resin infusion of preform after debulking cycle to see springback effects
- The effects that higher fiber volume fraction has on the mechanical properties; specifically penetration resistance of the composite to be examined.

ACKNOWLEDGEMENTS

S. Andersen and M. Scott for their guidance and support throughout the project.