High-Pressure Resin Transfer Molding (HP-RTM)

UD-CCM has the first open-access High-Pressure Resin Transfer Molding (HP-RTM) workcell in the United States. This processing system, installed in collaboration with Hennecke GmbH, can be used to manufacture ultra-lightweight and high-performance composite structures using fast reacting epoxy, polyurethane or thermoplastic resins. The system can be used for materials development, prototyping, and small-to-medium production runs, and it is capable of traditional HP-RTM, Compression RTM and Wet Compressing Molding, with processing times of less than 60 seconds. Our HP-RTM system is housed at a 24,000-square-foot facility that is fully ITAR compliant and provides for sub-component and full-scale part manufacturing and prototyping. The system is located next to pultrusion equipment for joint development programs, and a 1000-ton press will be fully installed nearby in Spring 2019.

This collaboration allows for:

- Industry sponsored programs
  - Materials Development (resins, core, preforms, etc.)
  - Prototyping
  - Small to medium production runs
- Academic partnering
- Government programs

UD-CCM has a long history in liquid molding simulation and fabrication. As an Office of Naval Research Center of Excellence established in 1997 under the leadership of Professors Suresh Advani and Jack Gillespie, UD-CCM has received more than $13.5M government investment in automation, sensing and control, modeling and characterization of LCM processes. “This foundation and expertise will be leveraged to create unique HP-RTM solutions for automotive, aerospace, and sporting good applications,” says UD-CCM Director Jack Gillespie.

Hennecke
Polyurethane Technology

For 70 years, Hennecke has been developing and designing high-class machine and systems technology as well as process technology for polyurethane processing. Thanks to intensive research and development work, Hennecke is able to offer innovative systems and technologies with highly economic and ecological benefits tailored to meet their customers’ requirements in a wide range of applications. Today, there is hardly any polyurethane-based product idea that cannot be realized by Hennecke.

Dirk Heider, UD-CCM, Assistant Director for Technology says, “This system creates new unique capability to produce high-performance, complex geometry parts at automotive rates and will support UD-CCM’s on-going large programs such as our DOE door and DARPA feedstock programs.”

Dan Rozelman, Hennecke Inc., Composites and Advanced Applications Sales Manager says, “Hennecke GmbH and Hennecke Inc. (Pittsburgh, PA) are excited to be collaborating with UD-CCM and its partners. HP-RTM is well established in Europe and Asia. Now the North American market will have access to this light-weighting technology through UD-CCM.”

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