



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 is capable of traditional HP-RTM, Compression RTM, and Wet Compression 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 can be used with newly commissioned 1000 and 250 ton presses and is co-located next to pultrusion equipment for joint development programs

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 \$20M 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 Associate Director, Dirk Heider.

Sai Aditya Pradeep, UD-CCM, Research and Development Engineer 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."



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.

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