

CIRAS Provides Tools to Optimize Plastic Processes and Products

In the last few decades, polymers have emerged as a cost-effective solution for numerous applications in the materials and chemical processing industries. Because of their desirable characteristics—light weight, impact strength, and ease of processing at relatively low temperatures—plastics have experienced a surge in demand.

The use of polymers for a variety of engineering, medical-device, pharmaceutical, and general consumer applications keeps growing. And with global competition continuing to put pressure on profit margins and time to market, manufacturers are constantly looking for ways to innovate in the areas of product performance and production efficiency. CIRAS is here to assist with these challenges.

As one of the many services offered by CIRAS, Polymer Processing Assistance provides manufacturers with the tools to innovate and optimize plastic processes and products.

Shankar Srinivasan, a project manager with CIRAS, specializes in the areas of bioplastics, polymer processing, testing, and characterization. He works with CIRAS clients to increase polymer process efficiency, improve product quality, and enhance the employee knowledge base of polymers, which in turn helps improve product performance.

Polymer processing of thermoplastics commonly relies on heat, friction, shear force, and pressure to shape and mold polymers into desired products. Some common processes include the following:

Extrusion—converts plastic materials from solid to liquid states and reconstitutes them as extruded finished components

Injection Molding—forms products by injecting molten polymer into a mold

Compression Molding—uses compression along with heat to mold objects

Blow Molding—uses hot air to form hollow containers

Rotational Molding—relies on heat to melt the polymer and coat the interior of the mold that holds the resin

Srinivasan recently worked with Hy-Capacity, a Humboldt, Iowa, manufacturer and remanufacturer of agricultural parts, to assess their knowledge base of plastics processing. He created training modules, such as Plastics 101 and Thermoplastics (thermoforming process and

technologies), for the production staff. He also provided cab kit polymer production assistance and worked directly with the Hy-Capacity staff. The end result was a high-quality product and a production crew that was well versed in polymer processing methods.

In the last year, Srinivasan met with Mo Lockwood, the manufacturing manager of Thombert, a Newton, Iowa-based manufacturer of polyurethane wheels and tires for narrow-aisle lift trucks. He helped Thombert understand the basic mechanisms involved in the polymerization of their polyurethane wheel production. Srinivasan conducted random sampling and characterized the polymers to determine any possible irregularities.

“The collaboration between CIRAS experts and our engineers has resulted in enhanced knowledge that translates into improved product quality,” explains Lockwood.

Srinivasan enjoys the opportunity to provide technical expertise and facilitate interactive sessions that identify root causes of manufacturing problems.

“When working with a manufacturing team, we can help improve material selections to balance product requirements, manufacturing capabilities, and cost effectiveness,” says Srinivasan.

As a CIRAS project manager specializing in polymer processing, Srinivasan has the opportunity to extend his scientific expertise to Iowa manufacturers. “Any knowledge learned is only truly valuable when shared,” explains Srinivasan.



➤ For additional information, contact Shankar Srinivasan at 515-290-6702 or srigshan@iastate.edu.