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Herty Advanced Materials Center Launches Advanced Chemical Processing Unit

AUGUST 13, 2015



The Herty Advanced Materials Development Center (Herty), an applied research center of Georgia Southern University, today launched a new Advanced Chemical Processing (ACP) pilot facility. This new pilot facility allows Herty to expand its research programs and client services to those companies seeking to develop and test new advanced materials required in today's international and increasingly competitive markets. Applications range from the development of active fibers for water filtration, nutraceuticals and the production of biomaterials for automotive and aerospace parts.

"We listened to our industrial partners and engineered this new pilot facility to meet their future needs for material and chemical processing," said Dr. Alexander A. Koukoulas, President & CEO. "The scale and flexibility of this system is second to none and it integrates well with our extensive in-house capabilities. It provides our partners and clients with a unique platform for accelerating the pace of new product development in a number of growing industrial sectors, including biomaterials and discrete manufacturing."

The new ACP at Herty allows the development, testing and production of a wide range of advanced specialty and high performance materials, like nanocrystalline cellulose – an exceptionally strong, low-cost, renewable composite material that has multiple applications in the automotive and aerospace industries. It also enables Herty to process a wide variety of materials from minerals to polymers for industrial, nutraceutical and pharmaceutical applications, as well as for pulp bleaching.

"Nanocellulose has the strength properties similar to those of Kevlar® and is considered to be one of the most promising renewable biomaterial for the type of advanced composites used in the automotive and aerospace industries," said Dr. Omar F. Ali, Director BioProducts. "With our newly-designed facility and our expertise in processing this renewable material for multiple purposes, we are poised to help industry partners produce these advanced materials for a variety of current and next generation industrial needs."

The versatility of the ACP pilot area will also go beyond nanocellulose, allowing Herty to process anything from minerals to polymers, and to modify those materials – turning the pedestrian into exciting. One such amazing transformation will be the production of bio-based polymers, such as lignin, which can be used to produce low-cost carbon fiber. Additionally, the ACP pilot area will allow Herty to provide more traditional chemical processes, such as pulp bleaching, as an integral part of its traditional pulp and paper services.

"We now have the ability to process raw biomass feedstocks, such as wood chips and agricultural residues, and process this material to isolate the fiber. We can then bleach the fiber and produce roll goods," said Dr. Ali. "This means we can provide product developers with a unique one-stop-shop for processing natural fibers, making the process more efficient, cost-effective and streamlined for our partners," said Dr. Ali.

Finally, the ACP area will be used to prepare advanced polymer systems that can be used in 3-D printing applications. 3-D printing is revolutionizing manufacturing because it enables on-demand production everything from electronic components and auto parts to living tissue. The ACP pilot facility, we will be able technology developers to produce master batch quantities of materials used in a range of 3-D printing platforms.

At the center of Herty's ACP pilot facility is a versatile 500 L reactor, which can be used for continuous mixing, multi-component reactions, and continuous drying. All wetted parts are Hastelloy®, which allows the processing of corrosive materials, such as strong acids. The reactor system is fully instrumented, with data logging capabilities to monitor reaction conditions. Direct reactant injection and sampling is also available.

"More and more American industry is competing on razor thin differences – a lighter case or more break-resistant glass for a mobile phone, a lighter car body with an improved mpg, or lower-cost materials for manufacturing medicines," said Dr. Walter Chappas, Director of Herty's Advanced Materials Group. "This new reactor system offers a powerful platform for giving US industry new and innovative materials, from plastics to specialized coatings."

About Herty Advanced Materials Development Center

The Herty Advanced Materials Development Center, an applied research center of Georgia Southern University, is a world-class research, development, and demonstration facility. Herty is a new product and process accelerator providing technical, market, and development expertise in short-fiber composites, biomaterials, and biomass processing. Herty's expertise and extensive pilot-scale capabilities for prototyping new products help companies de-risk the commercialization process.

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