

NCC SELECTED TO SUPPORT GRAFTECH INTERNATIONAL PROJECT APPROVED BY THIRD FRONTIER COMMISSION

This month Governor Bob Taft announced awards for nine Ohio projects approved by the Third Frontier Commission. One of the award winners, GrafTech International, received \$7,945,465 for development and commercialization of graphite nanocomposites for next generation electronic devices. NCC will receive a portion of this award and provide an equal amount of funds from other sources to perform commercialization activities for the project.

GrafTech's award supports a \$16 million effort led by the company under the Ohio Third Frontier Research and Commercialization Program for Engineering and Physical Sciences to combine nanocomposite technologies with graphite-based materials for improved thermal and electrical conductivity.

As a key collaborator, NCC joins other project partners that include Wright Patterson's Air Force Research Laboratory (AFRL), NASA-Glenn, the Ohio Aerospace Institute (OAI), the Center for Multifunctional Polymer Nanocomposites and Devices (CMPND), Applied Sciences Inc., Case Western Reserve University,

University of Akron, and Maverick Corp.

Graphite nanocomposites are considered new and expected to drive revolutionary applications and develop unique intellectual properties. The collaborators form the only team in the world with the capabilities to create the 1000+ W/mK materials.



(From left to right) Sharell Mikesell, Lionel Batty, Gov. Bob Taft and Lou Luedtke.

NCC was selected because of its special expertise in carbon nanofibers and nanotube membranes or "BuckyPaper." Following an award of \$1.5 million in January 2006, NCC initiated work to produce, accelerate and commercialize a new fabrication process for bulk polymeric nanocomposites with controlled nanostructures, desired alignment, and high-tube loading.

In addition to making the technology more cost effective for industry, the application of nanotube BuckyPaper to composites will improve the performance and strength of military vehicles and aerospace structural materials, as well as

reduce fuel and structural maintenance costs.

Super strong and lightweight, the nanofibers and nanotubes also have application for lightening strike protection and directional thermal and electrical conducting applications in materials and devices.

STATE RELEASES FUNDS TO NCC TO RAMP UP NEW TECHNOLOGY

NCC announced it will receive operational funds from the State of Ohio to launch a program that will fuse two key technologies to give aerospace and automotive manufacturers critical material performance advantages. The program is expected to add jobs to the Dayton region.

The funds are part of an umbrella award that helped to establish the Center for Multifunctional Polymer Nanomaterials and Devices (CMPND) at NCC in 2005. Managed by the University of Dayton Research Institute (UDRI), NCC supports CMPND with its commercialization capabilities.

In collaboration with UDRI, NCC is teaming with Ashland Performance Materials (a division of Ashland, Inc.), Owens Corning, Ohio State University and WebCore Technologies Inc., to take material produced with Quickstep to a higher level of performance by modifying it with nano particles.



“Quickstep has a much faster cycle time than normal aerospace autoclave processes,” said Harry Couch, NCC Technical Consultant. “The use of nano particles will allow us to take the advantages already provided by Quickstep to the next level by improving shear strength and toughness in aerospace and automotive applications. The first application for this nano-enhanced material will be personal protection devices.”

By harnessing the special strengths of these processes, NCC will be able to give manufacturers a competitive edge over global low cost sourcing. “As a commercialization agent that nurtures entrepreneurial development through incubation and manufacturing acceleration, we understand the practical value of equipping manufacturers with the advanced technologies they need to compete,” said Lou Luedtke, President of NCC. “This cooperative venture is a good example of how technology can be transferred into jobs that help produce better products.”

THREE JOIN NCC TEAM FULL-TIME

Jessica Ravine, Ryan Snyder and Crystal Yexley have joined the NCC team as full-time employees. Ravine is now a program manager at NCC with responsibilities that include managing the materials testing laboratory as well as a Nano Graphene Plate-Reinforced Polymer Composites program.

Ravine received her bachelor's degree in Chemical Engineering from the University of Dayton (UD) and is currently pursuing her master's degree in Materials Engineering with a focus in composites.

The Technical Oversight Committee (TOC) at NCC awarded Ravine funding for her master's thesis project to develop a method to integrate finite element and mold flow analyses to model long fiber thermoplastic compression molding. Ravine also manages NCC's engineering co-op program and is involved in the design and optimization program as well as nanomaterial projects with a focus on thermal and electrical applications.

Snyder is also a recent graduate of UD with a bachelor's degree in Chemical Engineering. Since joining NCC in May 2006 he has received extensive training in composites molding and testing methods.

Snyder is now been appointed a full-time composites engineer with a focus in nanomaterials. He will concentrate on methods for rapid prototyping of composite parts. Snyder has acquired computer software skills that include HEEDS, ABAQUS and CAD, as well as programming expertise in Visual Basic, C++, and Python. He plans to pursue a Ph.D. in materials engineering in order to explore the thermal and electrical properties of nanomaterials.

Yexley, selected in June 2006 as a Marketing Representative intern, has been named Manager of Business Services for NCC. Yexley completed her Masters of Business Administration with concentration in Management, Innovation, and Change in November 2006 from Wright State University. She will cover responsibilities for all administrative processes including Human Resources, Purchasing, Marketing, and serve as Manager of the First Financial Knowledge Center.

QUICKSTEP TO LAUNCH DEMO DAY EVENTS AT NCC DAYTON CAMPUS

Quickstep, a unique molding process, was unveiled in October when Quickstep Technologies Pty Ltd (a subsidiary of Quickstep Holdings Limited) established its North American Quickstep Center of Excellence at NCC's Dayton Campus for Advanced Materials Technologies (DC-AMT). To showcase the QS20 composites production machine's capabilities, Quickstep is planning a series of Demo Days.

The Quickstep process uses fluid-filled, balanced pressure, heated floating mold technology for the curing, partial curing and joining of composite materials. The process can use thermoset and certain thermoplastic prepregs as well as wet resin/dry fiber to produce superior composite parts that feature improved strength, stiffness, surface finish and appearance while



achieving aerospace grade void contents of less than two percent.

Participants that sign up for a Demo Day will receive:

- A comprehensive presentation on Quickstep technology
- Hands-on participation in the lay-up and curing of parts
- Direct interaction with Quickstep experts

Dates are available in March, July and October 2007. To sign up or to find out more information email marketing@amtdayton.com

NCC TO HOST JANUARY FORUM ON COMPOSITES PROCESSING – NANO TO MACRO

An emerging technology forum will be held January 17 at NCC on new processing technology and processing equipment especially relevant to composite processing. Participants will learn more about the latest developments in long fiber technology, carbon nanofibers, nanoclays and other composites. The forum will also include the latest developments from NCC and CMPND.

To learn more and register online visit the “Events” section of www.polymerohio.com Additional information is also available at: www.compositecenter.org or by calling PolymerOhio at 614-901-8866.