

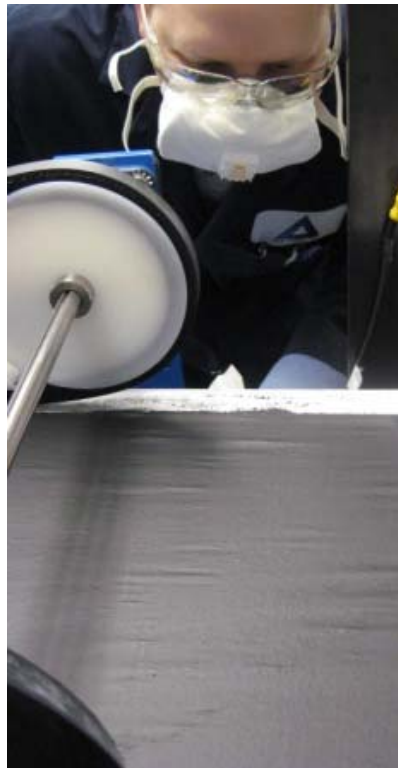


# April-May 2009

## THE NATIONAL COMPOSITE CENTER AND NANOTECHLABS CREATE NEW DAYTON DIVISION TO ADVANCE NANO CARBON COMPOSITES

North Carolina-based NanoTechLabs has teamed with the National Composite Center (NCC) to create a new division called Buckeye Composites. Housed in NCC's headquarters facility, Buckeye Composites will focus its work on the commercialization, scale-up and production of nano carbon composites that use buckypaper.

Buckypaper contains carbon nanotubes (CNTs) or other carbon nanomaterial in a membrane or paper-like format and is the core technology behind the new division. What began as development work between NCC and NanoTechLabs has resulted in manufacturing successes that include the production of a 12-inch-wide by 50 foot roll of buckypaper – the largest sample known to be produced to date.



Construction and installation of a 12-inch-wide continuous line in the NCC nano facilities has recently been completed. Buckeye Composites will initially target thermal and electrical property enhancements for aerospace applications while reducing weight relative to existing material solutions. Contract work will be performed for the Air Force.

The ability to integrate CNTs into composite structures with buckypaper allows manufacturers to access the performance properties of CNTs using existing production processes. "One of the benefits of our buckypaper process is its versatility," said Jessica Ravine, Ohio Division President for Buckeye Composites.

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## NCC'S NANOCOMPOSITE AND BIO-COMPOSITE LAB LAUNCHES STUDY FOR SMC SCALE-UP

NCC's new Nanocomposite and Bio-composite Laboratory has launched a study to understand how bio and nanocomposites can be integrated into Sheet Molding Compound (SMC) processes. The laboratory's work, under the direction of Dr. Rujul Mehta, is being funded under the Center for Multifunctional Polymer Nanomaterials and Devices' (CMPND) Research Commercialization Program (RCP).

Dr. Mehta has teamed with Harry Couch to begin defining the science of bio and nano-enhanced SMC materials. Couch manages NCC's Bio-Lite Center of Excellence which focuses on commercializing new SMC "recipes" to help manufacturers improve performance and reduce costs. The team has begun to screen a variety of candidate materials to observe and catalogue potential obstacles to

commercialization and develop solutions for technical challenges that emerge. "Current SMC mixtures don't use the new materials," said Dr. Mehta. "We need to define the science to understand how these new materials will work in existing chemistry systems and materials." The use of these new materials could help manufacturers using traditional SMC systems expand

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## NCC & NANOTECHLABS' NEW DAYTON DIVISION TO ADVANCE NANO CARBON COMPOSITES

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"We can use a variety of carbon nanomaterials including CNTs, carbon nanofibers (CNFs), and nano scale graphene platelets. We can also incorporate binders during the paper making process or during post production pre-pregging steps."

According to Ravine, the buckypaper process is very scaleable. The

company has plans to scale to a 52-inch wide continuous process.

Buckeye Composites has also hired a chemical engineering Co-op student participating in the University of Dayton's Cooperative Education Program and the Ohio Third Frontier Internship Program. Buckeye Composites is also tapping local resources through NCC's business

incubation program. "In addition to the technology support, the opportunity to interact with NCC's network of composite industry experts facilitates end-user collaboration that is critical to our product development success," she said. For more information contact Jessica Ravine at [jravine@compositecenter.org](mailto:jravine@compositecenter.org)

## NCC'S NANOCOMPOSITE AND BIO-COMPOSITE LAB LAUNCHES STUDY FOR SMC SCALE-UP

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market applications and achieve lower operating costs without recapitalizing. SMC and BMC have been shown to provide value by reducing weight, lower tooling costs and overall costs for shorter runs, and a positive life cycle cost analysis. The use of bio materials also further enhances the advantages of SMC and BMC over steel and aluminum.

As part of Phase I, the team is adding bio and nanocomposites at different levels and in different measures.



Results will be documented and recommendations made on how to solve potential problems. "We know for example

that bio and nano-particles tend to absorb moisture," said Dr. Mehta. "We need to develop a solution to eliminate that problem." The team is hand mixing and hand curing various combinations and using the study as a precursor for full scale-up on the Bio-Lite Center's SMC line. In addition to resins, the team is looking at how these new materials work with different polymers. For more information contact Dr. Mehta at [rmehta@compositecenter.org](mailto:rmehta@compositecenter.org) or Harry Couch at [hcouch@compositecenter.org](mailto:hcouch@compositecenter.org).

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## ZYVEX WINS THIRD FRONTIER FUNDS – NCC IS A COLLABORATOR

Zyvex Performance Materials, Inc., based in Columbus, Ohio, in collaboration with PolyOne Corporation, University of Akron, Shawnee State University, University of Dayton (UD) Research Institute, National Composite Center (NCC), Center for Multifunctional Polymer Nanomaterials

and Devices (CMPND), Wright Center of Innovation, Renegade Materials Corporation, Hexion, PolymerOhio, Lockheed Martin, Owens Corning, and Hexcel, was recommended for \$4.9 million in funding from the Ohio Third Frontier commission to further develop and produce carbon nanotubes modified

with Zyvex's unique Kentera technology. The carbon nanotubes will be used to develop advanced composites for lighter, stronger and lower cost products, with potential applications in the marine, sporting goods, aerospace, and high-end automotive industries.

## COMPOSITE ADVANTAGE WINS ECONOMIC DEVELOPMENT PROJECT OF THE YEAR

Composite Advantage LLC (CA) received the 2009 Economic Development Project of the Year Award from CityWide Development Corporation. The Dayton-based agency announced the awards during a special event held in April.



Scott Reeve, President of Composite Advantage

CityWide encourages economic growth in the Greater Dayton area and southwest Ohio by offering creative business financing solutions to people who want to expand an existing business or start a new one. "CityWide's financing support helped make it possible for us to acquire a

22,000 square foot manufacturing facility," said Scott Reeve, President of Composite Advantage. "A former steel fabrication plant, the building really suited our

requirements for producing very large Fiber Reinforced Polymer (FRP) components." Not long after moving in, Composite Advantage developed and installed the United States' first Drop-N-Place prefabricated FRP composite bridge superstructure system. The Drop-N-Place system has derivative options for vehicular, pedestrian and portable applications. CA's original FiberSpan deck panels can be quickly installed on steel beams or truss structures. CA's composite pads and mats provide a corrosion resistant, high performance solution for construction and building activities.

## THE NATIONAL COMPOSITE CENTER ENHANCES HIGH TECH MEETING ENVIRONMENT

NCC has enhanced its Knowledge Center to offer a meeting environment that can serve high tech businesses as

easily as the next social gathering. Housed in NCC's headquarters facility, the Knowledge Center was designed to

host classes, symposia, meetings, conferences or trade events in a professional yet unique setting.

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Dayton Region

## THE NATIONAL COMPOSITE CENTER ENHANCES HIGH TECH MEETING ENVIRONMENT

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The Knowledge Center has a 255-seat auditorium equipped with state-of-the-art media and surround sound capabilities, two large classrooms able to hold up to 60 individuals and four break out rooms for eight to 15. Flash Drive import capability means users don't need a laptop. The Knowledge Center's capabilities include video teleconferencing, multiple viewing

frames and the ability to record a conference. NCC also provides a list of caterers with a wide selection of menus for breakfast, breaks, lunch and evening events.

The Center is conveniently located at the center of a cluster that includes the University of Dayton (UD), downtown Dayton, Wright-Patterson AFB, Wright

State University and Sinclair Community College. The Knowledge Center is just 30 minutes from Dayton International Airport.

For more information about using the Knowledge Center at NCC please contact [events@compositecenter.org](mailto:events@compositecenter.org), call (937) 297-9450 or visit the website at [www.compositecenter.org](http://www.compositecenter.org).

