

ASHLAND ADVANCING COMPOSITE USE IN AUTOMOTIVE INDUSTRY

Ashland Specialty Chemical, a National Composite Center (NCC) founding member company located in Dublin, Ohio, is helping to advance the use of composites in the automotive industry by supplying a variety of thermoset resins for products used by GM, Ford, DaimlerChrysler, Toyota, Honda and Nissan.

A division of Ashland Inc. (NYSE:ASH), Ashland Specialty Chemical is a leading, worldwide supplier of specialty chemicals serving industries including adhesives, automotive, composites, metal casting, merchant marine, paint, paper, plastics, watercraft and water treatment.

Ashland Specialty Chemical has two major composite business groups – Composite Polymers and Specialty Polymers & Adhesives. The company provides thermoset resins used in four major categories – Class A exterior panels, structural parts such as pickup truck boxes, underhood and interiors for mass transit applications.

According to Cedric Ball, global marketing manager – the

transportation market for Ashland Specialty Chemical, applications like the pickup truck box, is a natural fit for composites. But today's commercial use of the advanced material in automotive structures like the truck box can be traced in part to development work done by organizations like the NCC.



Ashland Specialty Chemical

In 1997, initial National Institute of Standards And Technology (NIST) and Department of Energy (DOE) research dollars were awarded to NCC to participate in a project to produce composite pickup truck boxes. Manufactured by NCC in small batches the prototype pickup boxes were put on test tracks by the "Big Three" with composite boxes eventually marketed to the public by Chevrolet.

Since then, NCC has taken the knowledge gained from this project, expanded its preforming and closed molding capabilities and birthed a number of successful product applications

in a wide variety of other commercial markets. For companies like Ashland Specialty Chemical, the awareness raised by such development projects continues to help pave the way for ongoing commercial applications. "In relation to the use of traditional materials like steel, aluminum and even magnesium, the science of composite material is still relatively young," said Ball.

"Automotive requirements are very stringent so new "technology" is sometimes slow to take hold, but with growing applications like the truck box, momentum is beginning to shift. The industry is beginning to see that composites are not just a substitute material but the right fit for the job."

According to Ball, the three major pickup truck box designs on the market today, all of which use Ashland resins, are taking advantage of composites because the material permits designs not easily produced in metal.

The truck box demonstrates how composites can be engineered to provide more features, improve performance and offer better value when considered up front in the development process. One of the most

compelling aspects of composites is the greater design flexibility it gives automotive manufacturers. "At lower volumes and shorter product cycles, the need for design flexibility will continue to drive the growth of composites," he said.

The automotive industry is under tremendous pressure to reduce costs. "Composites can be very cost effective," said Ball, "but there is a misconception that composites are expensive." "This is where an organization like NCC brings value. During the last five years, advances in composites made by organizations like NCC have helped to raise awareness about composites among those who make material decisions."

"In addition, the optimization and modeling work at NCC is a great resource for demonstrating what can really be achieved with composites," he added. "The Center plays a [third] critical role by partnering with universities to increase knowledge about composites among students who will become the next generation of decision makers at auto companies and elsewhere."

As a second tier supplier to the automotive industry, Ashland Specialty Chemical works with

customers up to the OEM level. "By working closely with our customers we're able to provide input on processing as well as and how our materials will work in a given application," Ball said. "NCC's ongoing work in the arena of composites process development, however, is important for the industry. Companies like ours are focused on their respective products whether it's resin, glass, or other ingredients. NCC serves as a resource for the advancement of manufacturing processes that incorporate all our specialties."

Ashland has invested many years of research into the development of specifically tailored products that together represent the broadest product line in the industry. Primary research and development activities are based in Dublin. Ashland Specialty Chemical also works closely with its Research and Product Development teams in Europe and Asia to serve customers throughout the world.

NCC MAKES PROGRESS WITH NEW DESIGN CAPABILITY

In 2004 NCC added a finite element analysis package, Genesis™ Design Optimization, from VR&D, Inc., (www.vrand.com) to help

manufacturers integrate composites into structural designs and harvest substantial cost and weight savings among other benefits. In May 2005 NCC announced it had expanded its design capabilities with the addition of ABAQUS and the Center is already making progress with the new software.

Under Dr. Brian Knouff, NCC's Design and Optimization Program Manager, ABAQUS has been successfully implemented into the Center's Design and Optimization portfolio. ABAQUS gives NCC the capability to model applications with large deflections and nonlinear material properties. "The graphics illustrate how we used ABAQUS to model a design we could not have done previously.

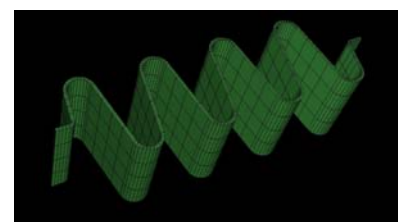


Figure 1

Figure 1 shows a spring with a snake-like profile. "To perform this design effectively, it is critical that as the part's fibers twist and turn, the properties of each element also change in like fashion," said Dr. Knouff. "To



Advantage personnel received assistance from teachers in product and market research. A composite screening questionnaire was developed for potential products.

Manufacturing process costs were also evaluated for some of NCC's technologies and a cost analysis tool built for composite molding processes.

TIMES COMMUNITY NEWSPAPERS SALUTES NCC AS PART OF SPECIAL EDITION

On July 27 Times Community Newspapers will publish two special "editions," saluting employers of the Miami Valley. More than 100,000 homes throughout the Dayton area will get an inside glimpse of NCC and other important employers. Don't miss this snapshot of NCC's milestone accomplishments this year.

NCC and member company Advanced Cerametrics Inc., were also featured in the July issue of High Performance Composites Magazine. NCC and Findlay Hancock County Chamber of Commerce established the North Central Campus for Emerging Technology (NCC-ET) in May and announced in June the intention to purchase the Findlay

Center for Business and Technology. Formerly known as the Intersil Building, the 250,000 square foot facility houses NCC-ET and other tenants. NCC-ET will continue to serve as home to existing tenants but also intends to attract new high tech tenants to the area.

NCC-ET is the result of collaboration between NCC and ACI which netted a State of Ohio, Third Frontier Wright Capital project award for \$2.038 million in December 2004. The grant supports the commercialization of ACI's PZT fibers for energy storage and smart systems. Initial applications will target the aerospace and transportation industries. As the organization's first tenant, ACI has also played a significant role in developing the Manufacturing Acceleration Campus and strengthening NCC-ET's partnership with NCC in Dayton.

As a Manufacturing Acceleration Campus, NCC-ET is dedicated to advancing high level skills and expertise by offering space and services uniquely suited to the needs of technology and manufacturing communities throughout the Midwest. NCC-ET is also promoting economic development by helping to bridge the gap between research

centers and the final commercialization stage of production level goods.