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## Perception a problem for nanomaterial companies touting cost advantages

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Cost remains one of the main stumbling blocks to the widespread use of nanomaterials. Can they be produced cheap enough for automakers and other industries to embrace their advantages?

A Grand Rapids company launched this month, [Noble Polymers LLC](#), is touting the economic benefits of nanocomposites. The cost is more favorable, company officials said, when manufacturers factor in lighter materials, fuel savings, environmental considerations and overall quality.



“Although the cost per pound is higher for nanocomposites, the total material cost would be lower because of the lower specific gravity of the nanocomposites,” said Tim Patterson, who heads up Noble Polymers.

Nanotechnology researchers in industry have come up with promising yet expensive materials filled with nanoparticles. The added cost has hampered the widespread use of these polymers in vehicles and other products.

Nanomaterials produced within 30 percent of the cost of traditional plastics are less expensive in the long run because of weight reduction and fuel savings, Patterson said. A recent Noble customer, (Patterson declined to identify the company), saved 7 percent on production costs. “We gave them a lighter part and a better looking part,” he said.

Nanocomposites offer enticing advantages for manufacturers.

Ounce-for-ounce, they can be stronger than traditional polypropylene materials, more durable and heat resistant, less corrosive, easily recycled, and better able to withstand a crash. They also can be seamlessly molded for cosmetic benefits. The materials offer fuel savings both in part production and gas mileage for vehicles, researchers said.

“Nanocomposites use a small percentage of the filler to achieve the required properties, yielding a lower weight and maintaining impact properties,” he said. “Other advantages include enhanced flammability properties, better thermal stability as well as better barrier properties.”



Noble Polymers was launched by Cascade Engineering Inc., which makes a wide variety of polypropylene products from auto parts including dash-mats, bumpers, acoustic barriers as well as covers for V-8 engines, solenoids, manifolds and other areas. It also makes a line of products such as trash receptacles, office furniture and other plastic items. Cascade Engineering companies employ 1,200 people, about 750 in the Grand Rapids area. Cascade is a privately held company and declined to disclose fiscal information for the parent company or its new venture.

Noble provides a recognizable name for its emerging-technology and innovative products.

Noble started as an "experiment" by Cascade founder and CEO Fred Keller, who believed the company needed to develop innovative resins. Noble Polymers began in 1997 as a materials research group within Cascade Engineering. It has developed several patents and resins, compounds and polymers for injection molders. Over the last six years, it has also built a customer base independent of Cascade. Company officials believe Noble can expand into new markets beyond those of its parent. The company works with the major automakers but declined to disclose specific clients. In 2001, Noble branched into nanotechnology to find ways to improve its polymers, and developed its featured product called [Forte](#).



“Our new brand initiative reflects our emergence as a resource for plastic injection molders in a variety of industries, including furniture and appliance,” said Taher Abujoudeh, director of materials engineering at Cascade.

The new venture allows the company to provide tailored service for manufacturers with novel products, which often require close and confidential partnerships.

“Noble Polymers is driven by innovation – we are constantly developing products that can have a positive impact for molders, OEMs (original equipment manufacturers) and, ultimately, consumers,” Abujoudeh said.

Noble helps customers select materials and integrate designs, perform research, and guide ideas from the drawing board to the production line.

Many nanotechnology researchers and engineers expect nanocomposites to become the main direction for the next generation of materials. Patterson agrees.

“Given the environmental impact of using the nanocomposites instead of other filled compounds, as well as the enhanced thermal properties, this will make nanocomposites one of the main directions in the next generation of filled PP (polypropylene) compounds.”

Automakers have been reluctant to incorporate nanotechnology into widespread use in vehicles. Aside from cost considerations, nanocomposites have yet to establish a proven track record or undergo extensive safety testing. Whether the technology will ultimately replace much of the existing material in vehicles is still an open question.

“It might be a bit too early to tell since the field of nanotechnology is still young,” Patterson said.

“Automotive companies require intensive material approvals that usually take a long time, so any new material will take longer before getting it in the automotive industry.” Like other industries, automakers are trying to find ways to become more efficient and less expensive. Patterson believes that industry and consumers will often pay a little more for better quality. “(Automakers) are always looking for new technologies that will lead to solving problems and allowing for better fuel economy,” Patterson said.

“Nanotechnology and nanocomposites provide favorable solutions to many of these problems. At the same time, they (automotive OEMs) require that there be a cost savings associated with using nanocomposites. Our nanocomposite Forte has proven to provide a cost savings as well as lower-weight parts.”