

Glass' next big break

An innovative mixed-glass opportunity allows recycled glass to shine in a new product

by Brenda Grober

A New York firm is proving that recovered glass can be used to make a fascinating new product. Monroe Industries, Inc., a family-owned business located in the upstate community of Avon, began making solid surface, master cast engineered composites into shower stalls and countertops in an old warehouse in 1987. Since then, the business has continued to grow and evolve. Today, it's taking the lead in developing a unique type of beautiful and eye-catching recycled-glass building product that will stand against any other cast, solid-surface materials commonly used to manufacture shower bases, wall panels, tubs, vanity tops and backsplashes.

What distinguishes Monroe's products from other notable recycled-glass solid-surface materials, such as those produced by IceStone, LLC and Vetrazzo, is that Monroe's product will not be concrete-based. Instead, the business has patented a process that bonds difficult-to-market, mixed-color, contaminated glass – generated by many of the nation's municipal collection programs – with a specific polyester resin binder, creating a material that can be offered in a variety of styles and colors.

This process allows Monroe the flexibility to incorporate up to

70-percent recycled content in the manufacture of the cast surface material. And, though companies like IceStone offer products with similar, if not higher, recycled-content percentages, the difference between the two processes is that IceStone can only use very clean, color-sorted glass with its products, while Monroe can utilize materials recovery facility-generated material that has been processed by Richfield Springs, New York-based Andela Products, Inc.

Meet the cast

The incorporation of recycled materials is nothing new to Monroe Industries, Inc., and is – in part – what led company President John Webster to consider recovered glass for use in its products. Another line of Monroe products, for instance, utilizes scrap

mineral tailings from mines as the primary ingredient in the firm's basic polymer binder, replacing the alumina tri-hydrate or calcium carbonate used in the original product design.

Monroe is a leader in the cast polymer industry and is an active member of the International Cast Polymer Alliance. Most recently, company representatives participated in the American Composites Manufacturers Association's Composites + PolyCon conference in Tampa, Florida, a premier and comprehensive convention and trade show exhibiting some of the most innovative processes and techniques in the market today. Monroe's owners hold positions with the national and local affiliates of these trade organizations, where they always have promoted use of the best quality raw materials, including recycled feedstocks. John Webster has sat on the North East Cast Polymer Association board since 2000, while his wife, Bonnie Webster, who is Monroe's marketing specialist, is currently a board member for the American Composites Manufacturers Association.

After Webster was approached by Andela Tool and Machine President Cynthia Andela concerning the possibility of using processed three-mix glass in Monroe's recipe, he decided to investigate the idea. The waste minerals and pulverized glass are similar – hard silica compounds – and the scrap glass is no less durable or attractive than the mineral mixtures they were already using. Thus, he considered the glass to have the same potential as a composition material in Monroe's products, and subsequent testing proved him correct.

"Through many months of working with the patent writer and researching the glass industry, we found that, to date, there really has not been a product made with the flexibility that our casting division offers with glass," says John Webster. "Initially, we'll be offering solid, one-piece shower bases, five-foot by 12-foot wall panels, tubs, vanity tops with integral bowls and backsplashes. Phase two will be a product that can be used in chemistry labs and kitchen countertops."

According to Webster, in-house testing has provided positive results and the company has cast several vanity tops that have been sent out for professional testing. Analyses will assess thermal shock in addition to several other elements related to assuring long-term product strength, durability and stability. Monroe Industries'

personnel remain optimistic that the initial product line will be commercialized and sold publicly beginning April 2009. It might take another year to complete the research and development for Phase two products, but much of the real development work has already been completed.

Making the recycled glass building material even more appealing is that anyone using it will be eligible for LEED points.

Success by association

A close partnership with Andela has been integral in making the entire process work, and ensuring the new product line being as "green" as possible. Andela provides the glass, much of which comes from municipal recycling programs in New York's Capital and Mohawk Valley regions. Once Andela has crushed, cleaned, dried, and sorted the glass, by size, using its recently commercialized pulverization system, the refined product is then shipped 250 miles west to Monroe's facility. Andela's process system can additionally include a color-coating technology. And,

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because the material is ultimately bound within a polymer, the colors would be maintained indefinitely.

The New York Department of Economic Development's Environmental Investment Program (EIP) provided assistance to Andela Tool & Machine to help the business develop and build its newest process system, which was designed

with three-color mixed glass in mind. As most of the municipally-generated glass collected for recycling in New York is three-mix, it is one of the Empire State's recycling priorities to create the capacity to utilize the glass in value-added applications where glass color doesn't matter. Some of the initial end-markets Andela targeted – including glass as blast or filtration media, or as decorative landscape mulch – have taken off. However, there are many other options left to pursue, including refined recycled glass as a concrete component or as a substitute for a portion of the cement used in concrete, as a fire-retarding agent, as an industrial filler, or even as a component of a new building product, like Monroe Industries' cast polymer.

Monroe Industries has accomplished the research and development work for this new recycled glass building product on its own. Should the business need capital assistance to purchase equipment needed to fully commercialize its new product line, the EIP could be an option. For now, John Webster is continuing to work with several variable grades of pulverized glass, ranging in size from a fine particle of sand to bead-size particles. To date, the business has been able to produce some very attractive surfaces, even combining the recycled glass with mineral ingredients. The possibilities are endless.

Making the recycled glass building material even more appealing is that anyone using it will be eligible for Leadership in Energy and Environmental Design (LEED) points. "We're so excited about offering this green product to builders and helping architects get their LEED points," notes Bonnie Webster. "According to the architects we've been in contact with, this looks like a product that is needed in the industry. And, they seem very eager to learn more about the product as we move forward in its development."

Since Monroe's products are all manufactured to individual specifications, there is little or no waste that goes to landfill. However, if reject waste is generated, those materials are donated to local charities for re-use, as opposed to throwing them away. Over the long-term, Monroe plans to investigate the possibility of using other recycled materials for manufacturing purposes.

Monroe Industries wants to be as green as possible. As the business moves forward, it will continue to focus on improving the environmental compatibility of its products. A key innovation being

considered is the viability of using bio-based resins made from corn or soy as an enhancement to the polyester resins used now. The company is also looking at the potential for curing their products using solar energy to heat its post-curing room. Monroe Industries is definitely looking to be a trend-setter in the industry and a business to watch for future innovations.

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