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### Woven Glass? Markow & Norris Make It Possible

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Self-taught glass artists Eric Markow and Thom Norris set out to do the seemingly impossible--to weave glass into a fabric from which they would create sculptural art objects. What followed was a four-year journey of trial and error and pioneering experimentation that redefined both the potential color palette and forms possible with their chosen medium of fused glass. The result is a collection of table and wall sculptures that marry science, art and alchemy.



*Desert Skull. 27" x 25" x 6."* Markow & Norris. (Courtesy of Markow & Norris) [Click image to enlarge.](#)

Markow was trained as a chemical engineer; Norris, who majored in biology, began working with Markow in the early 1990s, creating stained glass windows inspired by organic forms. They traveled extensively, stimulated by such destinations as the Grand Canyon, Maui and the southwest, collecting unusual glass throughout the world to incorporate into their projects. "We would go in glass shops in Vancouver, for example," says Norris, "and ask to see glass in the back that might be thought too odd or expensive for the showroom, or that they weren't considering selling. Invariably, we would come away with something old or incredibly unique that no one else was working with that also gave us an expanded color range."

Markow and Norris quickly built a reputation for creating stained glass windows that departed from traditional expressions in glass. In 2002, their

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ongoing search for interesting glass and the desire to push the available color palette led them to fused glass, and the idea of making their own glass.

Cold, hot, and warm: Temperature is the way in which glass is understood by those who work to meld its form. Cold glass refers to stained glass that is pre-formed; hot glass is blown glass; and warm glass, a technique that has become most popular among artisans over the last twenty years, is fused glass. Fused glass is heated in a kiln to mid-zone temperatures that allow the material to be shaped and formed.

“From the outset, we wanted to set ourselves apart in the art world,” says Norris, “to create something no one else had done, something that would seem impossible to pull off.”

Fused glass seemed to provide them with an avenue to that expression. Markow and Norris found they could add glass powders to existing sheets of raw glass, or layer two sheets of different colors together to create a new hue. What had begun as a search for supplementing interesting glass for their stained glass projects quickly revealed itself as a means for taking control over the glass in unprecedented ways. Here was the medium that would allow them to shift their creativity--now they could produce glass that would be appreciated for its artistic merit and would showcase the energy involved in creating it.

Already seduced by color in glass, the concept of weaving glass grew out of the partners’ desire to inject texture into their pieces. In their early attempts at the technique, they cut small strips of glass, fused them together and cut them into squares that were rotated to resemble a checkerboard. After fusing, the pieces appeared at a distance to be woven, but closer inspection revealed that the true semblance of the warp and weft of fabric was eluding the artists. Their science backgrounds and love of the challenges of controlled trials proved invaluable to making them good fusers. Their determination to achieve a tight weave translated into innumerable experiments with firing schedules and kiln temperatures that yielded hundreds of pages of notes.

“The degree to which glass is heated is critical. Nothing we do goes to a full fuse, which means it goes completely flat, like a plate. You have to control the glass just to the right temperature so that you get it to bend but not to where it will melt with everything and become a sheet of glass. It took years to discover which kiln temperatures worked for which colors to get the same effect over the whole canvas of our sculptures,” says Markow.

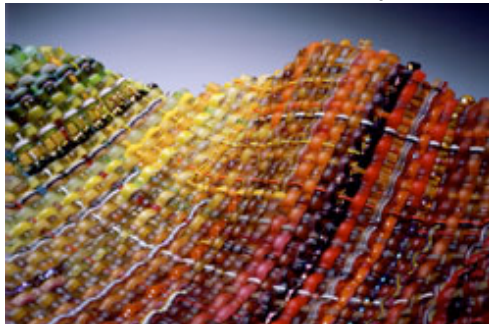
“The end product is not instantaneous,” he continues, “it takes a long time to get there. You can’t just take a piece out of the kiln and let it cool. There’s a whole process of how you apply the heat and [hold] the piece at different temperatures. Everything has to be staged. This schedule didn’t exist when we started weaving glass. We had to discover all those temperatures for ourselves.”

While glass producers make new colors occasionally, they only do so in single-colored sheets. On average, only fifty base colors are available commercially. “Even the manufacturers are surprised by our color range,” says Norris. “They have never been able to provide us with temperatures to support our color manipulations.”

Each Markow & Norris piece involves a six-week process that begins with the arrival of raw glass. The sheets of flat glass are about three by two-and-a-half

feet. These sheets are first cut into smaller strips. New colors are tested for color compatibility--not all glass will actually stick together without cracking. Colors to be used together are then tested to determine the range of temperatures each requires. Decisions are made about layering glass to achieve a new color or adding pieces of other glass to give more texture. Chasing a particular shade of chartreuse, for example, they may crush up some glass, add some opalescent glass and layer transparent glass on top. The glass is then cut into strips, which are woven by hand. Pieces then undergo three to four separate firings, each at temperatures of up to 1,500 degrees. Each piece spends approximately 200 hours from start to finish, coming in and out of the kiln. The pieces are finally fire polished over the artists' handmade molds.

In *Confetti*, one of the table sculptures weighing in at a hefty eight pounds and measuring nineteen inches in diameter, the artists were striving for a broad range of color within the palette of the general colors red, blue, green, yellow, and purple. Their process involved making and evaluating twenty or more hues of each shade to determine precisely the tones that would work together in transition throughout the surface of the piece. On the piece and each color grouping there are six to seven variations of that same color. These groupings of multiple variations of the same color resonate, bringing heightened vibrancy and energy to each shade and to the sculpture itself.



*Spring to Autumn* (detail). 19" x 19" x 5."

Markow & Norris. Pieces like *Spring to Autumn* feature anywhere between forty to sixty colors, an astonishing feat. "From the outset," explains Thom Norris, "we wanted to set ourselves apart in the art world...to create something no one else had done, something that would seem impossible to pull off." (Courtesy of Markow & Norris) [Click image to enlarge.](#)

nature of the Caribbean Sea, or a brightly colored Koi pond. The wall sculpture *Copper Canyon*, for example, captures in abstraction in tones of terra cotta, bone, and cobalt the striated and stark geological beauty of the southwest landscape. *Infinite Blue*, a wall triptych, depicts the clear iridescent tones of a Caribbean seascape.

Markow is inspired by the abstract elements in a landscape and the myriad colors presented by a natural scene. Normally unable to find the vivid, vibrant colors of glass to duplicate nature that he desires, he mixes all glass colors himself, creating an infinite color palette distinct from that of any other glass artist. Though Norris prefers to first sketch out a rough estimate of the art, Markow's ideas are usually imagined and built on a light table without a drawing. Markow and Norris give careful consideration to color transition both horizontally and vertically, creating both subtle and sharp color gradients. "We bring different approaches to the table when considering the beginning of any new piece of art," says Norris. "Working in tandem gives us exponentially greater creative power

Small and jewel-like by comparison, the six by six inch *Nest Babies* series feature a looser more organic weave in forms that recall the built-over-time feel of a bird's nest. Cradled inside each vibrantly hued concoction are the equally creatively colored "babies." With names like *Ice Babies* and *Mardi Gras Babies*, these pairs of otherworldly eggs speak of a species of dreams.

Both artists are itinerant travelers, inspired by the shapes of the natural world as well as the colors and contradictions of foreign lands. Norris responds to concrete objects in nature, and the unusual shapes and objects found in the desert: a cactus, a bull's skull, the striated colors of the Grand Canyon, the fluid, flowing

and imagination.”

Pieces like *Spring to Autumn* feature anywhere between forty to sixty colors. Here the palette gradually transitions from the bright, fresh, new greens of spring through the yellowing tones of summer to the intense burnt oranges of fall.

Given the time-consuming nature of their work, the artists produce only a limited number of works per year. The wait to acquire a Markow & Norris sculpture is often up to four months. Their works are represented in forty-three galleries across the U.S. and one gallery in New Zealand, including The Corning Museum of Glass, the Smithsonian American Art Museum, Barney's New York, and the Bellagio Hotel in Las Vegas.

“Our work is time-consuming and the process is complex, but ultimately the work itself is very simple,” says Markow. “We’re creating something, putting it together, putting it in the kiln. We never know exactly what’s going to happen. And that’s our ongoing process of discovery.”

Look for Markow and Norris at the Philadelphia Buyer's Market of American Craft Winter show in February 2007, or view their works online at <http://www.wovenglass.com>.

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