

CASE HISTORY

Durability drives use of powder coating for monumental sculpture

Dissatisfied with the impermanence of other finishes, a sculptor hires a New York custom coater to powder coat her intricately cut sculptures, adding another dimension to the symbolic messages of her work.

Peggy Wright *Contributing Editor*

A retired cop, Tom Retcho said, “Other powder coaters would find my business unique. My plant has powder coated everything from tubs to kitchen sinks to car wheels to sculptures.” Retcho started his company, Extreme Powder Coating, in 2007 after he became frustrated when trying to find someone to powder coat a 1972 Harley Davidson that he was restoring. He had received a bid of \$125 from a powder coater who was expanding, but when he went back to have the work done, the cost changed to \$300.

He eventually found another powder coater who gave him the lower price and showed him how he did the powder coating. “I thought it was something I could do,” Retcho said. “After my retirement from the police department, I was searching for a new focus. I set up my job shop with help from family and friends. I did everything myself when I first started, with my father’s help from time to time.”

Retcho took classes to learn technique. He attended two training classes, including a workshop held at Wagner Systems in Elgin, Ill. He bought all his equipment from one vendor. Located in New Windsor, N.Y., Retcho’s plant now has two employees, working one shift to powder coat mostly steel and aluminum and some brass.



*Kate Raudenbush builds her sculptures to be physically enveloping environments, such as the birdcage-like *Altered States*.*

The company's owner attributes the growth of his business, despite the economic climate, to offering high-quality work. "So many companies couldn't care less about quality," he said.

Going beyond the automotive

The plant powder coats some auto-body parts for auto-repair companies, but that work represents only about 5 percent of its business. And despite being generally a job shop, Retcho's 5,000-square-foot plant sometimes powder coats 400 to 500 parts per hour, such as when powder coating roof vents for a company called Active Ventilation Products. The vents are used in FEMA's (Federal Emergency Management Agency's) mobile trailers.

The plant also works on architectural parts; for example, it has powder coated a primer on stair pans that Brakewell Steel Fabricators in Chester, N.Y., is using in construction of the new 1 World Trade Center in New York City. That company specializes in spiral stairs. It pours concrete into the stair pans and then finishes the stairs with wet paint.

The plant's customers also include the State of New York and the US Marine Corps, for which it has powder coated boxes that mechanics use to service air-conditioning units in the field. The plant powder coats the boxes with a primer that the US government has approved and then sprays on a top coat of green wet paint. At the other end of the spectrum, the plant has powder coated stage materials for productions on Broadway and at venues in Las Vegas. One unusual item was a bus that appeared one year in New York City's Radio City Christmas Spectacular starring the Rockettes.

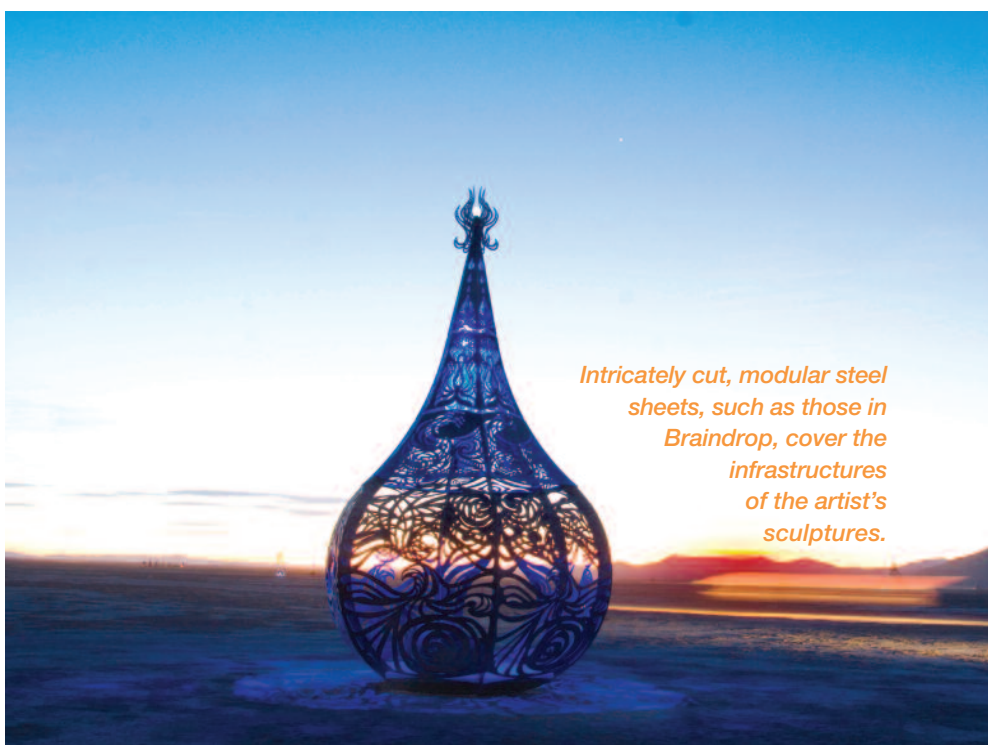
In 2009, Extreme Powder Coating started working with a sculptor, Kate Raudenbush. Originally a photographer, in 2004 Raudenbush found that she wanted to move from creating two-dimensional images to creating a physical experience in

three dimensions. Her inspiration for her new work evolved from her involvement with an annual cultural event, *Burning Man*, held in the Black Rock Desert in northern Nevada. The 25-year-old event is a gathering of thousands who build a temporary town called Black Rock City. She has attended *Burning Man* every year since 1999, and the spirit of the community and the participatory nature of the large-scale artwork form the foundation for her work.

Based in Williamsburg, Brooklyn, Raudenbush is a self-taught sculptor. In her work, she tries to create an enveloping environment that offers an allegorical message. For example, her 27-foot-tall sculpture *Altered States* forms the shape of the dome of the US Capitol at a distance, but up close the structure dissolves into a surface inhabited by faces, feathers, hands, eyes, eagles, monsters, and humans morphing into birds—stylistic imagery from the native tribes of the Pacific Northwest. Entry into the three-story structure is through one of 10 eagle doorways, which is meant to feel like stepping into a cage of white lace, Raudenbush said. A ladder holding three white swing seats descends from above, suggesting an elaborate birdcage. Repetitive use of

the eagle invites the viewer to consider the meaning of that symbol for the original native peoples of America and for the culture that conquered them. For the first, she believes the eagle represents insight, the spirit world, and the quest for the higher self; for the colonial culture, domination and power, raptor rather than helper.

Raudenbush initially draws the images for her sculptures by hand and then refines them in Adobe Illustrator. For her first projects, she persuaded her friend Joseph Alexander, an architect, to render her drawings in Rhinoceros, a professional CAD (Computer-Aided Design) software. She now hires someone to make the conversion to the CAD file. With



*Intricately cut, modular steel sheets, such as those in *Braindrop*, cover the infrastructures of the artist's sculptures.*



Artificial lighting enhances the viewer's experience of the artist's sculptures, such as in *Futures Past*.

the CAD file in hand, Precision Laser in Pawtucket, R.I., a long-time collaborator, laser cuts these designs into many separate sheets of steel. She integrates the sheets into a steel infrastructure that she fabricates from blueprints. Raudenbush creates everything in modular sections that bolt together because the sculptures have to fit into box trucks for shipping.

"I have a good sense of how to build things," she said. "I took some welding lessons and then worked with Specialty Steel International in the Bronx, N.Y., to fabricate my work." Specialty Steel has the roller, shears, iron workers, and industrial machines required to make her art. She has fabricated a lot of her sculptures with them, but she manages her own projects. Sometimes she brings an

assistant to help with the fabrication, and sometimes she uses the crew there. "Because of my access to a variety of machines and processes, my projects can become progressively more complex," she said.

Raudenbush's first welding project and sculpture, *Dual Nature*, is 38 feet wide by 38 feet deep by 8 feet tall. Her current work is much larger and generally weighs on average from 4,000 to 11,000 pounds. She said she always builds her sculptures to welcome human exploration. She also uses lighting and sound to add to the audience's experience. "I ask myself, 'How do I create a gathering space, an energetic space where people will want to stay,'" she said. "I try to imagine my friends discovering the place for the first time. I consider how comfortable the sculpture will

be to sit on or climb. My sculpture *Braindrop* has 3 inches of upholstered seating inside." *Braindrop* is powder-coated, but a powder coater other than Extreme Powder Coating did the work.

In the past, Raudenbush has used metal patinas on her sculptures because she wants them to look earthy rather than slick. These patinas, however, require routine maintenance by application of shellac to protect the metal from the outdoor environments in which they usually reside. Often the maintenance doesn't occur; so she has turned to powder coating because it doesn't require such upkeep. She would love, however, for a supplier to develop a powder coating that looks like metal with a patina, such as rusting metal or the green patina that copper takes on with age.

Working together to create art

In 2009, Raudenbush was invited to display her sculpture *Altered States* in the middle of a large field at CoSM, or Chapel of Sacred Mirrors, an artist's retreat on 40 acres in Wappingers Falls, N.Y. At the time, Raudenbush was looking for a coater to redo the powder coating on the sculpture. In 2008, she had hired a powder coater to do the original work, but some of it popped off during transport between venues. Raudenbush is unsure if the cause was oils that remained on the metal due to improper cleaning before powder coating or if the curved parts of the sculpture flexed too much in transport, causing the paint to separate from the metal. She needed a powder coating company nearby to restore the sculpture, and Extreme Powder Coating fit the bill.

When asked what her sculptures require in a powder coater, she said, "The plant needs space. I have to ask 'How big is your oven? How much weight can your rack hold?' The plant needs a powder coating booth that can hold a car." Because of the large size of *Altered States*, Retcho's plant worked on its modular pieces to fit them into its sandblasting room, washer, powder booth, and oven.

Sandblasting. Raudenbush said she was happy when she discovered that the plant has sandblasting on site. She said she finds that sandblasting best prepares the metal for powder coating. In addition, moving the sculptures between two plants is time-consuming, expensive, and difficult.

For *Altered States*, the plant had to remove the previous powder coating through the use of sandblasting to ensure good adhesion of the new powder. Retcho indicates that removing powder coating can be difficult and time-consuming because it's such a good, long-lasting product.

At its start, the plant had an 8-foot sandblasting cabinet. It now has a separate room for sandblasting. Retcho currently is trying to buy a 10,000-square-foot building to allow the sandblasting to occur in a separate building, a layout he prefers because the dust can cause problems during powder coating. He also wants more space to allow the plant to powder coat even larger work.

Retcho has found a new blasting media, a recycled crushed glass, called New Age Blast Media, from Novetas Solutions that the US government has approved for work such as the plant does for the Marine Corps. The plant used the glass to clean Raudenbush's sculpture. Extreme Powder Coating buys the material in 3,000-pound sacks and has machines that recycle it. Employees sweep the media off the floor after its use and put it in a hopper connected to a machine that filters out reusable glass. The material usually goes through the machine three or four times before no useable media is available. Retcho likes this media: "Glass creates a lot less dust than stone, which fragments and breaks down faster as well as makes more dust."

Chemical pretreatment and washing. For *Altered States*, the plant pretreated the steel with iron phosphate because Raudenbush's sculptures move a lot between venues. The plant always pretreats parts that don't need sandblasting or that it would damage, such as

those made of a very thin-gauge aluminum that would tear apart. The plant also pretreats about half of all sandblasted parts to ensure the quality of the finish.

The plant uses a dry-steam unit for chemical pretreatment. Retcho's building doesn't provide the drainage that other types of equipment require. The dry-steam unit generates a current of water that it turns into steam, which then mixes with the chemical. The steam comes out of 3-foot nozzle with a trigger, and the unit provides a knob that the user can turn to control the amount of the chemical added. Sometimes, the plant just steams off grease before spraying the part with the chemical. It purchases the iron phosphate from Chemetall.

The washer is a separate unit on a 3-foot-long skid. The plant loads parts on the racks, which Retcho built to fit the oven. After loading, employees wheel the racks to the washer and then put the parts in the oven to dry. When they're dry, the plant does any required taping or capping. For *Altered States*, the plant had to tape all the threaded bolts.

When the taping is complete, the parts are generally cool enough, just below 200°F, to begin the powder coating because the powder won't melt prematurely at that temperature. The heat actually aids in the adhesion of the powder when the parts go into the powder booth.

Powder coating. The plant uses a variety of powders, including powder from Tiger Drylac, NIC Industries, and others. The plant buys the powder for custom work. Retcho requires a wide palette to meet his customers' needs. He's found interesting ways to get the colors that a customer requires. One customer brought in a section of fence with stamped flowers and vines on it in the central section. Retcho experimented, using a water-based paint to add additional colors. He powder coated the central section green, taped it off, and then powder coated the rest of the fence black. He air-brushed the roses red and the

leaves green with the water-based paint and then powder coated a clear coat over the entire fence. It worked.

For *Altered States*, Raudenbush picked an off-white powder. Retcho said, "White is hard. When you are working with it, a part can look coated, but the powder may not be applied thickly enough for the proper finish. If the coat is too thin, the part will have transparent spots when it comes out of the oven where you can see the metal."

The sculpture offered some other challenges. Retcho said, "Powder coating the laser cuts in the modular parts was tricky. We had to make sure the powder got into the angles, particularly those of less than 90 degrees. We had to do a lot more inspection because of the angles."

The plant applies the powder per the manufacturer's specifications, usually 2.5 mils in thickness. It uses close to 600 pounds per year, excluding the powder that the plant uses for powder coating the trailer vents for Active Ventilation, which supplies its own powder. The plant does not reclaim powder because it rarely powder coats a large number of parts in the same color.

The powder booth has a blanket filter in front and four pocket filters, with HEPA filters in the rear to catch any powder that gets past the other filters. Every two to three months, employees clean out the booth and replace the filters.

The plant puts any excess powder in empty powder boxes and bakes it until it turns into a brick that the plant can then discard. The waste has a small environmental impact and is considered a nuisance dust.

Curing. The convection oven is 20 feet long by 10 feet tall by 8 feet wide and has a 1.5-million-BTU natural-gas burner. It has a 2-foot air chamber between the top of its ceiling and the outer part of the oven. Around three sides, it has 3-inch holes in the ceiling, which



The US Marine Corps uses powder-coated boxes to service air-conditioning units in the field. Extreme Powder Coating coats the boxes with a government-approved primer before it sprays on a green liquid top coat.

allows air to circulate better and bakes the powder better. It also has an exhaust in the lower left corner.

For *Altered States*, the plant couldn't bake a lot of pieces at once because of their size. Sometimes it could put only two pieces in the oven, and it had to be very careful not to scratch those pieces.

Packaging and shipping. Retcho indicates that the plant now has an 18-foot box truck for deliveries. It has helped the company to expand because it can pick up and deliver parts.

The nature of the business, a job shop, means that packaging is not a large issue for the plant. Sometimes it just requests that customers bring blankets to cushion parts, for example, motorcycle parts, when they come to pick them up.

Raudenbush picked up the sculpture. Retcho found extra people to help load the modular pieces, and they used some packaging—brown paper, cardboard, or wrapping foam—to separate the pieces and keep the powder coating from rubbing off.

Growing the business

Retcho attributes the growth of his business, despite the economic climate, to offering high-quality work. "So many companies couldn't care

less about quality," he said. "In my plant, we inspect everything. I have talked to customers who have had problems with other companies' work, such as my customer who gets race-car frames powder coated. He said that sheets of powder would peel off when he power-washed the frames. My plant constantly is fixing problems in other powder coaters' work."

As a result, Retcho thinks that no one in his area is really a competitor. He also thinks that his company provides better customer service than other powder coaters. "When I have a good customer, I do anything for them," he said. "I never say 'no.' I have a customer who owns a hair salon and who came up with a system to hold hair colors. One powder coater cancelled his account because he wasn't ordering enough. I get referrals because I have a good reputation. I get things from Staten Island and Albany."

For Raudenbush, Retcho took extra time and care when dealing with her sculpture because she requested it.

Looking to the future

Retcho thinks the powder coating industry is heading in a positive direction. He said he thinks that powder coating is getting more exposure and that companies are beginning to redo specifications to request powder coating where they previously requested wet paint.

Retcho is always looking for ways to make things faster or easier, but he believes that you can't take shortcuts in critical areas because they'll affect the finish. He loves what he does and enjoys dealing with people just as he did when he was a police officer.

Raudenbush currently has work in permanent collections, such as the Nevada Museum of Art, and she continues to place them in temporary exhibits. Her sculpture *Futures Past* will be in a park called Patricia's Green in San Francisco for a year starting early in 2012. The

Black Rock Arts Foundation in Nevada previously helped her put a sculpture in downtown Reno for six months. She displayed *Braindrop* at the Gowanus ballroom this past December. The ballroom is a huge alternative art space in an industrial part of Brooklyn. She said she plans to have Extreme Powder Coating powder coat future sculptures. And she continues to search for surfaces that look like rust or have unusual textures. "Sometimes a paint color can inspire a work of art," she said. **PC**

Editor's note

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