Resting Easy with Powder Coating

Powder coating is the perfect finish for the perfect hammock . . .

In the fall of 1994, Alan Whittemore walked into Teknicote Inc. and started asking a lot of questions. "It was an intriguing meeting," noted Judy Catalon, vice president of sales and administration for Teknicote, Central Falls, Rhode Island. "And it was basically one-sided." The customer asked about the company's history in powder coating, its techniques and results. However, he never gave any details about his product.

"Usually, when we meet with potential customers, it is an exchange. We ask a lot of questions about the product in question so that we can explain the best process for the project and also to make sure we were the right company for the job," explained Ms. Catalon. It was not until Teknicote signed a confidentiality agreement that Mr. Whittemore, president of Heliotrope, felt comfortable disclosing the details.

Heliotrope, a limited liability company headquartered in Providence, Rhode Island, designs high-end outdoor furniture using aluminum and stainless steel components. It was founded in August 1993, by Gary Wolf of Boston-based Gary Wolf Architects, Inc. and Alan Whittemore, a Rhode Island real estate developer and former client of Mr. Wolf's.

When Heliotrope first opened its doors, it had one product, a hammock, called the Zephyr™. "The inspiration for developing the hammock came from a black and white photocopied image of a tiny bent-chipboard model I had made," said Mr. Wolf. "The image of a serpentine frame combined with my own experience with hammocks from my childhood was really the springboard for the product design." The traditional hammock's lack of durability was a key issue in terms of materials and finishes. Painted steel hammock frames eventually rust, peel and crack. Weather tends to deteriorate wooden-frame hammocks.

With these issues in mind, Messrs. Wolf and Whittemore drew up basic guidelines to help them create a better hammock. In addition to a new form, the hammock had to be truly weather resistant. It also had to provide the potential to replace only the fabric bed instead of the whole hammock. The frame had to securely mount to a base (as an option), and

the fixed frame had to have the ability to rotate in place.

It took one year to develop the Zephyr hammock from design, to manufacture to packaging. Within that year, Mr. Whittemore traveled throughout the country searching for the best companies to manufacture and complete the product. "I sat down with hundreds of vendors in all the industries, and for powder coating, all roads in New England led to Teknicote," said Mr. Whittemore.

"In the beginning, we investigated resin transfer molding for the frame," added Mr. Wolf. "We finally chose powder coating on aluminum extrusions instead because it is the material of preference for contemporary products at the upper end of the market. Aluminum is durable, strong, lightweight and recyclable, and powder coating is an environmentally friendly finishing process."

Teknicote powder coats the hammock's aluminum frame with a white polyester specifically used for outdoor applications. It withstands ultraviolet rays, extreme heat and cold. The finish not only benefits the product due to its durability, but adds a sophisticated, modern appeal.

Heliotrope unveiled the Zephyr hammock prototype at the Chicago Casual Furniture Trade Show in September '94. When Heliotrope selected Teknicote as its powder coater, the product was still undergoing fine-tuning. Teknicote powder coated dozens of sample by hand.

"We have a customer-driven operation," said Alan Nathan, part-owner of Teknicote. "To me, the definition of such a company is to have the product ready when the customer wants it, not when we can finish it." That is why company profits are used to install more equipment, update existing systems and improve service.

Teknicote has five hand-operated lines and six automatic ones. "If necessary, we can run the same product on two lines to meet a deadline," said Mr. Nathan. "In addition, because we are a large operation, we can run the parts in half a dozen places so we are rarely backlogged."

Teknicote has two sites, one in Central Falls and one in Cumberland, Rhode Island. The Cumberland plant has three automatic lines that are used primarily for high-volume, large and small parts. The Central Falls operation has three automated lines that handle low-volume parts requiring high-quality and high-tech plastic coatings. This is where the Heliotrope sample parts were coated. Once the shape of the Zephyr frame was finalized, it was put on an automatic line in Cumberland.

When the aluminum frames arrive at Teknicote they are first cleaned in an acidic cleaner that also lightly etches the surface. After rinsing, parts enter a second cleaner to remove any smut. Once rinsed, the pieces receive a chromate conversion coating. After rinsing, parts are sealed to close and neutralize any gaps in the conversion coating. Cleaners and conversion coatings are from Dubois Division of Diversey Corp., Cincinnati, Ohio.

Parts are then run through a con-

vection oven to dry, after which the frames are ready for powder coating. Powders are applied using electrostatic spray. Teknicote uses powder coatings from a number of suppliers, including O'Brien Powder Products, Protech Chemicals and Morton International.

Technique also plays a part in the process. Inherent in the procedure are high-current density areas that prevent proper coverage without the right equipment and expert sprayers. Automatic lines from Gema, Indianapolis, Indiana, have fixed and oscillating guns in addition to hand spray booths. "Our state-of-the-art equipment allows us to coat pieces with a precise, even thickness which is usually hard to attain," said Mr. Barthelemy, vice president of production and engineering. "We are also successful at coating selective areas of a piece regardless of complexity."

Part of Teknicote's operation that Heliotrope found attractive was its environmentally safe process. "At Teknicote, we are environmentally conscious," said Mr. Barthelemy. "All wastewater from the cleaning process is run through a pretreatment system from which approximately 50 pct of the water is recycled. We also recycle the powder." While Teknicote is in compliance with current environmental regulations, the company's goal is to recycle all of its water to reach zero discharge.

"Not only are our facility and equipment first rate, but our staff is equally as impressive," said Mr. Nathan. "The three middle managers who run the day-to-day operations in Cumberland and Central Falls and our quality control system have been with the company since it opened in 1972."

For quality control, Teknicote employs in-process inspectors, roving inspectors and a quality control lab that tests durability, thickness and adhesion, among other parameters.

"Not one of our pieces ever came back with orange peel," said Mr. Whittemore. "And every part was wrapped for protection."

Heliotrope has received national recognition for the Zephyr hammock design and Messrs. Wolf and Whittemore attribute part of its success to Teknicote's work. The Chicago Athenaeum Museum of Architecture and Design awarded the Zephyr one of its Distinguished Product Awards last year in its "Good Design—Made in the USA" product design competition. The American Society of Interior Designers gave the Zephyr hammock one of five First Place Design Awards for 1994. And, Heliotrope received the IDSA/Business Week Industrial Design Excellence Award. The Zephyr hammock has appeared on the cover of *Innovation* magazine, the quarterly journal of the Industrial Designers Society of America. It also made *Time* magazine's top ten best products list of 1994.

Heliotrope is currently working on a less expensive curvilinear steel hammock frame and is also designing other outdoor furniture, including lighting, seating, tables, and sun and wind screens. Teknicote will be there to assist the company in its future endeavors. **PF**

FOCUS: Powder Coating Systems

1.
POWDER COATED Zephyr hammock

2.
EARLY HAMMOCKS were sprayed by hand. Later versions are powder coated on an automated line.

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