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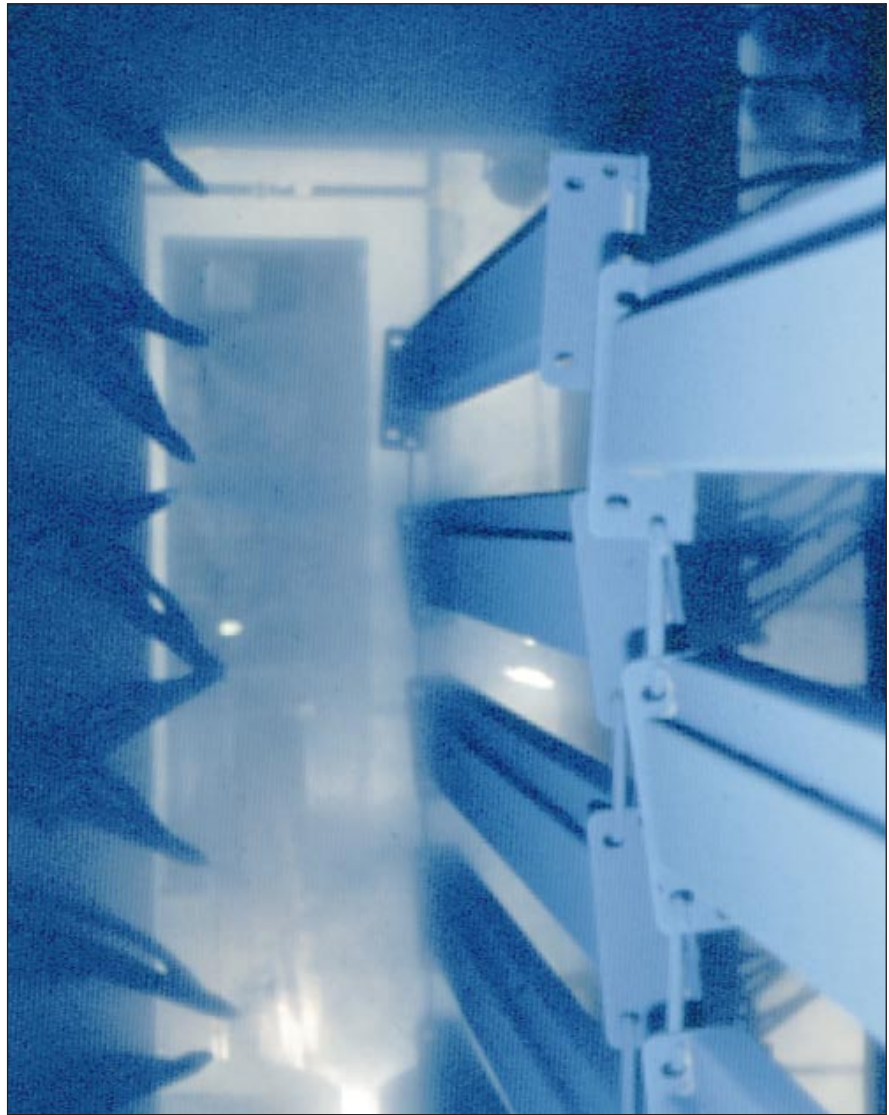
## Racking Up a Success Story

*Steel King installed a powder coating system and realized many benefits . . .*

At Steel King, Stevens Point, Wisconsin, the industry's largest full-range racking-storage-container manufacturer, the goal is to ensure customers receive the exact racking system products they want, when they want them. Products that are innovative, durable and attractive, as well as affordable and readily available. Steel King's products range in size from 40 inches to 40 ft, come in a variety of shapes and configurations and are coated using one of a dozen or more common and special-order colors. Once powder coated, they are quickly loaded onto trucks, shipped to a customer's site, unloaded and assembled on-site.

Until 1996, Steel King used a manual, high-solids enamel liquid paint operation with a push-and-shove conveyor system. It produced more than 50,000 racking/shelving parts in as many as 15 different colors each month. This labor-intensive production schedule was difficult enough to maintain, let alone keep pace with the increasing demands of the company's steadily growing customer base. In addition, waste and VOCs (and their associated disposal costs) had to be eliminated.

Today, Steel King's built-to-order business is booming. Two shifts per



*Shelving exits the powder coating system and goes to the oven where it will cure at 375F for 25 min.*

day keep pace with growing demand and only four operators are needed, not 24 as with the old liquid system. Multiple colors are used routinely. Efficiency runs steady at 97%, with virtually no VOC waste. Rejects are down while quality has soared. And customers are more

than satisfied. At the center of this successful operation is a powder coating system that is still capable of handling 2-1/2 times current production levels to accommodate future growth.

**Selecting a system for success.** Two years ago, Steel King decided

an automated system was needed to meet its customers' exacting specifications and critical deadlines—without sacrificing quality. The company focused primarily on a 54,000-sq-ft addition to its New London, Wisconsin, production facility that would house a new paint operation.

"The success of our operation is all about painting," said Steel King plant manager Steve Krueger. "From a marketing perspective, it is essential that we offer a complete selection of colors that will look good for a long time, despite use and abuse in their environment. But from a production standpoint, our entire operation must run smoothly, efficiently and safely, while providing us with the flexibility we need to coat multiple colors on any given day."

In light of short- and long-term objectives, Steel King analyzed several options, including water-borne, two-component liquids and baked enamels. However, the company's goal to eliminate VOC problems soon led to powder as the most viable choice.

"We looked at three powder system vendors, reviewed capabilities, conducted trials and evaluated existing systems in the field," said Steel King vice president of manufacturing Gary Rosenberg. "And we were quite impressed with what we learned. However, color change still concerned us, since significant material waste is typically associated with that process, and any waste impacts the bottom line." A demonstration of Cyclo-Kinetic® technology by Nordson Corporation convinced Steel King it had found the solution.

**The system in action.** With the completion of the new expansion in March 1996, Steel King installed three independently run Cyclo-Kinetic® (CK) booths, each with 20 Versa-Spray® II automatic guns. The push-and-shove conveyor



*Powder Coating system with recovery system.*

system was replaced with a highly sophisticated, fully automated power-and-free conveyor system. The new conveyor system required 15 miles of control wire within the new building, as well as two different computer systems to effectively merge all incoming information and track carriers through each stage of production.

Using a standard production flow pattern, Steel King's products enter the powder coating operation by way of a new prep and pre-wash system. A 168-ft washer easily accommodates even the largest parts. The three-stage process includes a heated wash, iron phosphate, rinse and final rinse cycle. The conveyor then moves parts into a dry-off oven, for an eight-minute dry-off at 225F, followed by a short period in a cool-down zone.

Once inside the environmental room, two system control devices identify the parts and select parameters for gun triggering and powder flow rate. The automatic guns trigger as the parts arrive and shut off as the final parts pass through. The booths continuously

ramp up and down as groups of parts enter and exit the booth.

Parts next enter a 2,500-sq-ft cure oven for 25 minutes at 375F. Finally, parts are cooled and conveyed into the packaging area for immediate shipment or short-term truck storage.

**Coating operation sets production schedule.** "Because all products are built-to-order and shipped directly to the customer for assembly, getting parts through the paint system used to be the most significant issue in our scheduling process," explains Mr. Krueger. "But with the new operation in place, manufacturing and shipping are now being challenged to keep up with our coating capability." The entire coating process, from product leaving the welding tables to its arrival at the packaging area, now takes less than two hours.

"The booths give us the flexibility we need to change colors continually, without the waste and expense," said Mr. Rosenberg. The booths use a series of small, horizontally positioned separators to remove oversprayed powder particles from the air stream, offering a viable

alternative to spraying color to waste. "This technology was designed specifically to run fast, allow for multiple color changes and remain efficient. That's exactly what we needed."

**Powder system's benefits.** "It's a win-win situation all the way around," Mr. Krueger stated. "The CK system gives us better coating quality and efficiency, and gives our marketing group the ability to offer a broad color selection. The guns are equipped with ion collectors that help overcome Faraday-cage effect for better transfer efficiency. And because product size varies so dramatically, dual flow rate control lets us increase or decrease powder flow only when necessary to reach into corners that are otherwise difficult to coat with the stationary guns. This gives us more precise control for depositing powder where it is needed for optimal coverage and with virtually no waste."

Mil thickness averages 3.5 mils. With improved coating durability Steel King estimates it now saves more than \$300,000 per year in protective packaging material that was once required to separate parts during shipping. Today, packing

material is used only to separate strapping from product surfaces.

And better coating quality has virtually eliminated the 1.5% customer reject rate from fisheyes, drips and runs. Since repainting a job on-site typically costs between \$30,000 and \$50,000, the company also saves an additional \$375,000 annually.

**Exceeding tomorrow's goals today.** Total annual powder use is approximately 360,000 lbs, or the equivalent of 1.6 million gal of liquid paint.

"We track every pound of powder that goes in and out of our booths, as well as the filter systems," said Mr. Krueger, "and our efficiency is running steady at 97%. Our liquid system was only 40 to 60% efficient at its highest.

"Equally important, we can powder coat any color a customer requests," Mr. Krueger continued. "In fact, we now have more than a dozen standard colors in inventory, 10 of which are applied frequently. And we anticipate adding more colors." Currently, all three booths in the New London production facility run a different color every day, with one or two scheduled color changes.

Initial reaction to Steel King's introduction to powder coating couldn't be better. Steel King employees are buoyed by the leap to leading-edge finishing technology, and customers are more than satisfied with the difference in finish. After running only two years, there have been zero finish quality problems in the field.

All objectives Steel King specified at the onset of its painting conversion process were achieved: paint multiple colors efficiently, eliminate VOC waste, and reduce labor costs. "Beyond these accomplishments, what is most gratifying," Mr. Krueger offered, "is that we ended up with a whole laundry list of other benefits too, ranging from significantly reduced packaging costs to enhanced product finish appearance and reduced customer rejects.

"With this powder coating system, every Steel King customer gets exactly what it orders, when it wants it. And in our business — in any business — is there a better formula for success?" **PF**

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