



Strengthening a Powder Coating Line

FITNESS EQUIPMENT MAKER CYBEX SHAPES UP ITS SYSTEM IN EIGHT DAYS.

By Jeff Hale
Gema

ABOVE: Cybex has reduced color-change time by 50 percent and consistently performs reclaim-to-reclaim color changes in 8 to 10 minutes.

When Cybex International, a manufacturer of premium commercial fitness equipment located in Medway, Mass., wanted improved flexibility, greater throughput and lower operational cost in its powder coating system, it took its own advice and got its line in shape.

Cybex's cardiovascular and strength equipment, which is used in homes, local fitness clubs and hotel fitness centers, as well as by collegiate and professional athletic organizations, is considered some of the premium products on the market and is sold in more than 90 countries around the world.

But the lack of production flexibility coupled with an inability of the company's existing finishing line to achieve contamination-free color change meant things needed to change.

"We couldn't compete unless we automated," says Bernie Murphy, Cybex's senior manufacturing engineer.

Cybex, which was awarded its first product patent for an isokinetic testing device in 1970, had been down this road before in upgrading its coating processes. The company had previously consolidated manufacturing operations into two locations in Massachusetts and Minnesota, and began to focus on product color customization and reliable lead times.



Cybox's new system uses a powder management unit to manage its color palette and still provide efficient recovery and reuse of powder.

Cybox's Bravo Functional Training system is one of the top fitness and exercise machines on the market.

12-SPRAY-GUN SYSTEM

In 2000, Cybox installed a powder coating system in its Massachusetts plant that was intended to accommodate the spraying and recovery of multiple colors. The approach was to use 12 automatic powder spray guns mounted on two reciprocating machines for gun movement. Manual reinforcement of parts was handled by two operators positioned in opposing manual spray openings located in the sidewall of the booth. The booth cabin and recovery equipment were designed to address the color-change needs and facilitate a color change-over in 15-20 minutes.

Although it initially met Cybox's needs, the system began to underperform as the years went by. Impacting the performance were changes in the colors the company offered, inefficiency of the application and recovery equipment, and difficulty in obtaining replacement parts.

Murphy says Cybox realized it was not using the automatic guns and instead was relying more on manual coating of the parts. In addition, the operators were performing the coating operation within the booth cabin as opposed to outside of it, as specified in the original design.

Company personnel began looking for ways to increase automation of the powder coating process. Their concept was to utilize robotic machines with automatic powder coating guns to replace the existing automatic and manual guns.

LOW TRANSFER EFFICIENCY

A leading factor influencing the removal of the existing automatic guns was the realization that their transfer efficiency was as low as 20 percent and the use of their existing reciprocators contributed to poor finish quality.

"The scope for the previous capital booth project was focused on reducing the color change time," Murphy says. "However, for this project we needed to also increase transfer efficiency and reduce the amount of scrap powder."

Cybox engaged virtually all the major equipment suppliers of powder coating equipment and robotic machines.

"We researched and extensively studied several



Powder Coating Issues

- Reject rate as much as 25%
- As much as \$250,000 a year in wasted powder materials
- Heavy orange-peel finish on products
- Light coating in some faraday areas
- Contamination associated with color change

Benefits Realized

- Lowered reject rate by eliminating orange-peel finish
- Reduced powder waste as a result of increased transfer efficiency
- Eliminated color contamination issue
- Improved productivity by consistently performing color changes in 8 to 10 minutes
- Reduced manual coating labor required from 2 to 1 person

companies as viable options for procuring a new system,” Murphy says. “We conducted tests at each facility to identify the best process concept, graded product quality, and evaluated the application expertise of each supplier.”

After the first round of testing, Murphy says the company realized several important facts.

“We eliminated the idea of the robot all together,” he says. “And we reduced our supplier list down to two qualified suppliers.”

Further evaluation of the remaining two suppliers focused on transfer efficiency, understanding and use of powder guns on reciprocators, and ability to produce a part with the best overall finish appearance. After a thorough evaluation, Cybex chose Gema as the supplier of its new powder coating equipment.

The final configuration included installation of a Gema quick-color-change booth, the MagicCylinder. This system also incorporates the OptiCenter powder management unit to manage the Cybex color pal-

ette and still provide efficient recovery and reuse of the powder.

EVALUATING RECIPROCATORS

Additionally, evaluation of reciprocator use showed Cybex that it could, in fact, achieve a superior-looking finish.

“By using new reciprocators and powder guns we got higher transfer efficiency and a much better looking part than ever before,” Murphy says. “We also were able to reduce the number of people performing manual touchup from two to only one person.”

As for color-change time, Cybex was able to reduce the line downtime associated with color change, since the booth footprint was smaller than the previous equipment and the color change process was faster. The production line “color-change gap” was not as long, therefore giving Cybex an opportunity to improve productivity.

With a new system on the way, Cybex had to plan how and when to bring the new equipment online. To minimize disruption to the production line, the company decided to compact the demolition of the old and the installation of the new into a nine-day window right after the Christmas holiday.

In most cases, a normal installation timeframe for this type of system is two to four weeks, excluding weekends.

WORKING ON MONDAY

Cybex started the project on a Thursday at 5 p.m. after production was completed for the day, and installation was finished by the end of the day the following Friday. Demolition of the old system took one and a half days, and seven days were used to install the new booth. This enabled Cybex to start back into production the following Monday.

Cybex assembled three well-organized teams and worked simultaneously to meet this aggressive goal. The old equipment was disassembled in a safe and orderly fashion, and then

removed from the plant. Murphy says installation of the new system also was systemic and enabled multiple people to be involved without getting into each other’s way.

After several months of use, Cybex saw the expected benefits of the new system, including reduction in wasted powder and use of only one operator for manual touchup of parts.

One of the more challenging powders the company sprays is a metallic powder with significant metallic sheen, but Murphy says the design of the OptiCenter unit now gives Cybex the option to easily capture and re-spray this material when needed.

CHANGE TIME CUT 50 PERCENT

As it has become familiar with the color-change process, Cybex has reduced the color-change time by nearly 50 percent and now consistently performs reclaim-to-reclaim color changes in 8 to 10 minutes, while spray-to-waste color changes are completed within 4 to 5 minutes.

To accomplish these results, Cybex has relied on its manufacturing and production personnel to identify and implement process improvement projects that produce results.

Much like the fitness and strength products it produces, the production team at Cybex is now able to achieve full performance from the state-of-the-art powder coatings system to which it has now successfully upgraded. ■

Information in this story supplied by Gema and Cybex International. For information on Cybex, visit cybexintl.com. To reach Gema, visit gemapowdercoating.us.

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