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Back to School With Powder

New system at American Desk increases productivity over 50%

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When any manufacturer converts from paint to powder coatings, several important cost, quality, and productivity issues must be considered. For American Desk (Temple, TX), the overriding issue was to settle for nothing less than the best system available.

American Desk is a leading manufacturer of furniture for business and institutional use. Its product line includes classroom, auditorium, stadium, dormitory, and laboratory furniture.

American Desk had operated two high-solids paint lines for 30 years. The decision to convert from high-solids to powder coatings was driven primarily by the increasing costs of waste disposal and the desire to eliminate solvents from the coating process. Furthermore, the cost of operating the paint lines was increasing faster than product output. The new powder lines have enabled American Desk to produce a quality product at a reduced cost in cleaner work conditions, not to mention compliance with future environmental regulations.

System design

In January 1993, one of the paint lines was demolished, and a new



powder coating line installed. During the construction process, which took approximately six months, all products were painted on the remaining paint line. After the powder line was fully operational, the company demolished the second paint line in September 1993.

The system design includes:

- five-stage washer
- 6-min dry-off oven
- two powder coating booths with 14 powder guns each
- two paint booths
- 25-min bake oven
- 1700 ft of enclosed-track conveyor with three drive units.

It was quite a challenge to design a layout that accommodated all of the above equipment in only 9500 sq ft of floor space. In addition to the powder booths. American Desk wanted the flexibility to meet small-quantity special color requirements of its customers. This was accomplished by maintaining two paint booths. Nordson Corp. (Amherst, OH) worked with a general contractor who was responsible for the system design, engineering, and installation of equipment, including the conveyor, ovens, and powder booths.

Milbank Systems (Kansas City) supplied the parts washer and ovens. The five-stage washer has a stainless steel top. The first stage contains an alkaline cleaner; the third, an acid cleaner in combination with a phosphatizer. The washer incorporates automatic chemical concentration monitoring and control systems. The pretreatment chemicals are designed to clean aluminum and steel products on the same line.

The dry-off and bake ovens have four-sided insulation and efficiently recirculate the heat to consume substantially less energy.

The conversion from high-solids to powder coatings was driven by the increasing costs of waste disposal and the desire to eliminate solvents.

A Nordson Versa-Screen® system controls various coating functions, including automated gun triggering. The powder application equipment includes two Nordson Excel 2000® booths that can be powered on and off the same line for fast color changes.

The epoxy powder coatings are supplied by Morton Powder Coatings (Reading, PA). American Desk currently uses two colors for about 90% of its output. A third nonreclaim module was installed to handle the remaining 10% of production.

Due to the complex shapes of the furniture being coated, manual touch-up is required on certain parts. The manual powder application area precedes the automatic application. This allows

the company to effectively apply powder into Faraday cage areas and ensures that manual operators do not apply excess powder to areas where manual reinforcement is not required.

Safety also played a key role in selection of the powder coating equipment. "Our insurance company required documentation of the equipment safety," explains American Desk president Paul Kerr. "Nordson offered Factory Mutual documented approval on its complete product line."

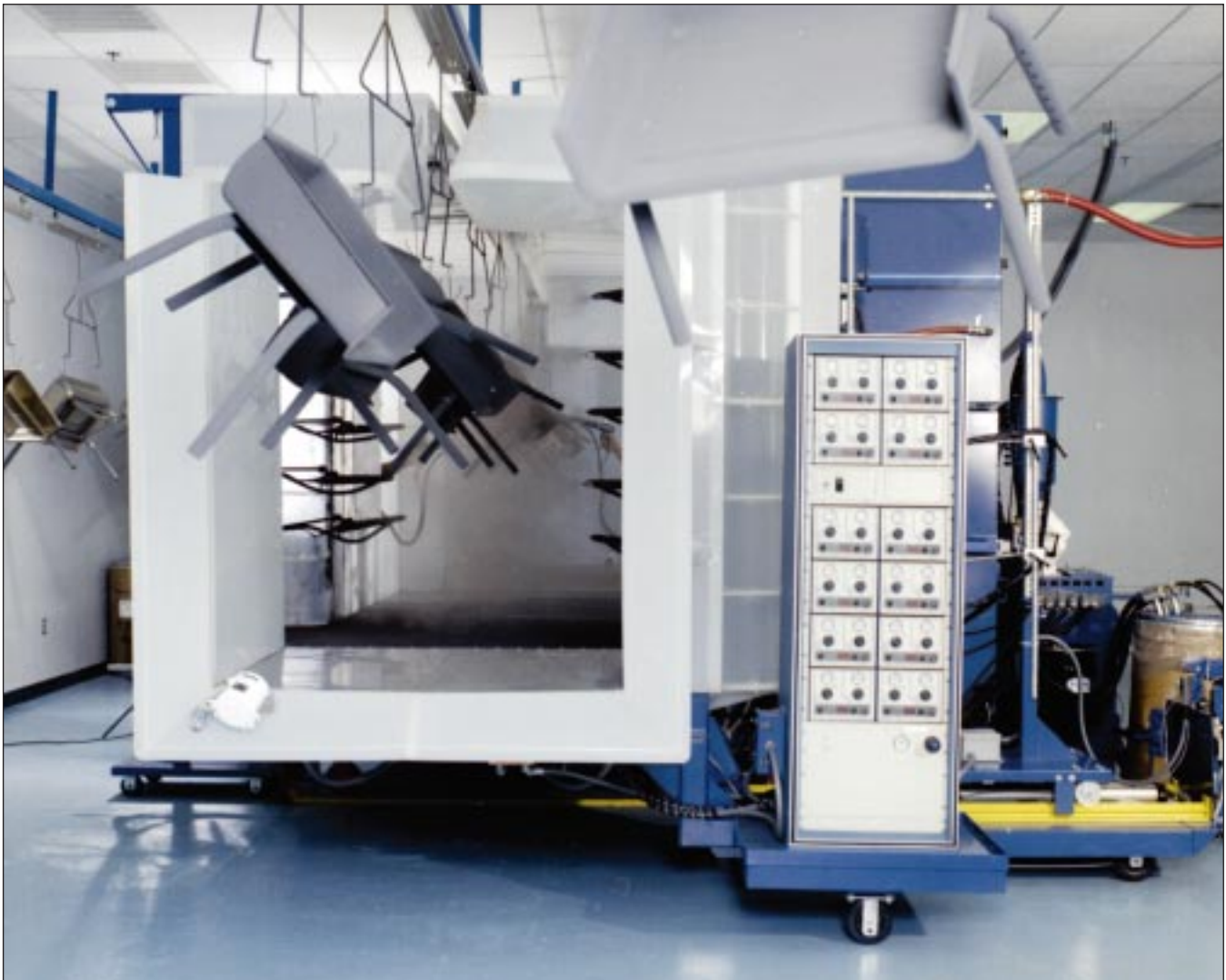
Increased productivity

Through increased line speed and improved parts-hanging technique, the powder coating system has increased productivity by 50 to 100%. "The importance of proper rack design and parts hanging cannot be overstated," comments Kerr. "When we converted from liquid to powder coatings, we redesigned the parts-hanging racks for more dense racking."

The new racks are hung from custom-designed stainless steel load bars that also serve as sanitary pans and prevent any conveyor debris from falling on the parts



Two powder booths can be rolled on and off the same line for fast color changes. (Photo courtesy of Nordson)



The powder line is equipped with a Nordson Versa-Screen system, which controls various coating functions including automated gun triggering. (Photo courtesy of Nordson)

during processing. The racks convey parts with correct alignment through the washer and powder coating booths and have increased throughput substantially.

Significant reductions in labor requirements have been realized. It is estimated that the powder line running for two shifts a day produces more output than three shifts with the former paint line. Product reject rates have declined dramatically, from approximately 10% of total output to less than 2%.

Although American Desk has achieved cost savings through productivity improvements and waste reductions, Kerr says, "You can't base the system justification

The paint line used to be the dirtiest place in the plant. Now it's a showplace!

on just cost and productivity. Other significant benefits, such as quality, can't always be quantified using traditional means. Our customers immediately notice that the finish is not only more cosmetically appealing, but also more durable.

"The new powder system has provided us with environmental benefits and has improved the

workplace for employees," Kerr continues. "The paint line used to be the dirtiest place in the plant. Now, it's a showplace!"

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