



Powder Application Case Study

Miller Welding & Machine Co., Brookville PA



Powder Coating Heavy Metal Fabrications Where Process Knowledge and Quality Control are Core Values

Miller Welding & Machine Co. is a custom metal fabricator with a focus on process control, product quality and an understanding of new technology. It's a formula that works well for them, as the company has expanded over the years from a small 2,400 square ft. garage into three large facilities in western Pennsylvania – Sandy Lick, Maplevale and Homer City – exceeding over 500,000 square feet in total.



Miller Welding & Machine Co., Made in America.

Started in 1963 by David Miller, along with his brother Lawrence and wife Sara, the company's capabilities include fabricating, welding, machining, finishing and mechanical assembly.

"I've been in the industry for over 33 years and have seen my fair share of steel fabrication facilities throughout the world," says John Binder, powder market manager for Nordson Corporation, one of the industry's

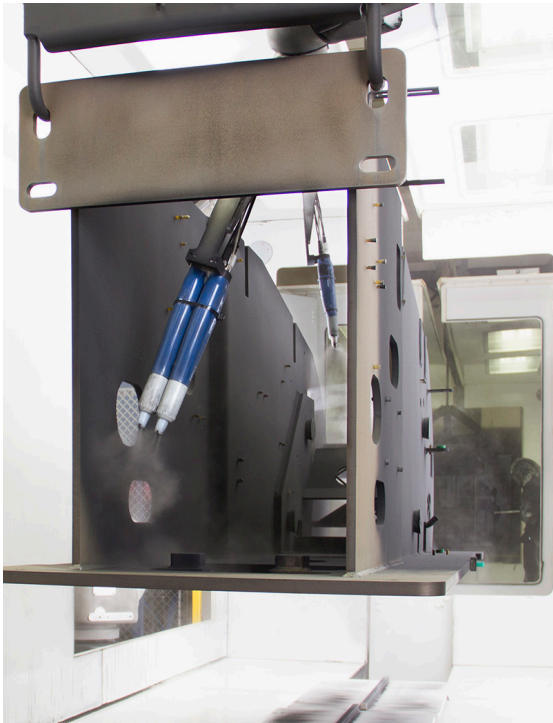
leading suppliers of powder coating application equipment. "My experience with custom metal fabricators is that companies that continue to invest in new technology and people have a better chance of growth and sustainability than their counterparts that don't invest as wisely."

At Miller Welding, "whatever it takes" is an attitude that permeates the shop floor. Employees have a solid understanding and skill to maintain the high tech equipment in the facility. "It's almost a hyper sensitivity toward understanding the various processes and how to operate a machine to maximize its capabilities," Binder says.

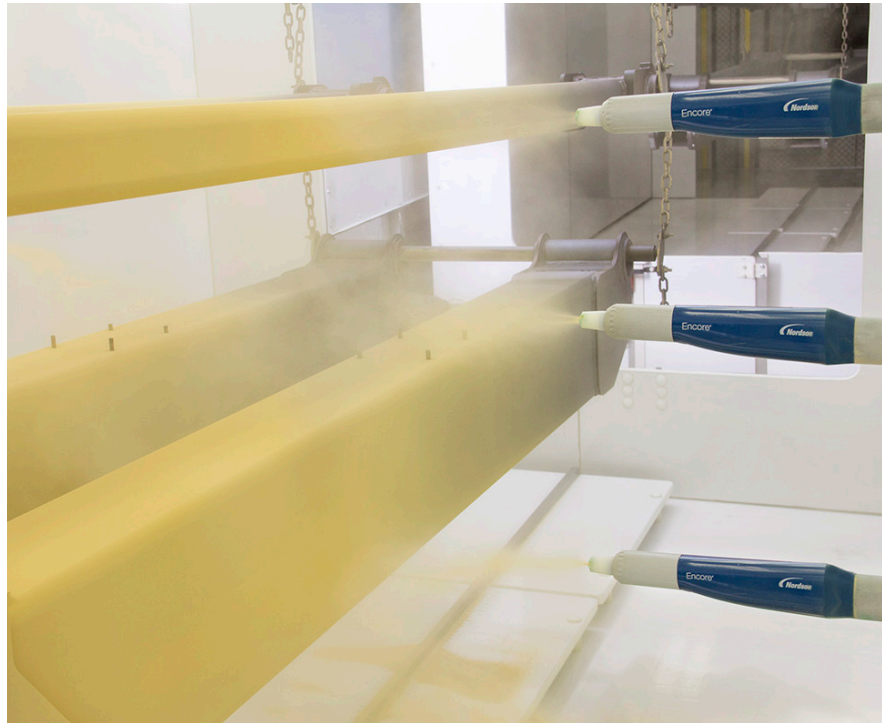
In 2014, Miller Welding decided to replace their existing powder coating system with two Nordson 22,000 CFM ColorMax® systems. Large parts required large systems and Nordson delivered two ColorMax systems, each with 22,000 CFM cyclones and dual 11,250 CFM after filters. The first ColorMax system in the powder coating room



An operator performs a color change from light to dark powder in the second ColorMax® system.



Robots fitted with dual Encore® HD automatic guns coat a part in the first ColorMax system.



The second ColorMax system contains twelve Nordson Encore automatic guns on two oscillators with in/out positioners, and two Encore LT manual guns.

accommodates two robots, each fitted with dual Encore® HD guns. Color changes are performed in an Encore HD Excel® feed center. Due to the large size of the parts being coated, line speed is 4 fpm. The film build thickness requirement is anywhere from 2 to 6 mils depending on the part being coated.

Encore HD guns and pumps are ideal for robot systems as they apply higher volumes of powder at a lower velocity than a conventional venturi pump. Additionally, because of the low velocity, the gun to part distance can be greatly reduced. These features are critical to reducing the overall cycle time required to coat the part. With Encore HD and the reduced gun to part distance, the robot program requires less articulation of the gun and therefore a lower cycle time.

“Simply by changing the angle of the Encore HD gun and reprogramming the robot, we were able to cut the overall cycle time in half as compared to the original program developed at start-up,”

says Miller Welding employee and resident robot programmer Dave Goodman. Goodman’s extensive experience programming robots including Yaskawa, Motoman and Fanuc, provides Miller Welding with the expertise to achieve the highest capabilities of its process machines. He also mentioned, “The Nordson powder coating systems coat so quickly that parts are coated faster than they can be unloaded.”

The second of the two Nordson ColorMax systems contains 12 Encore automatic guns on two oscillators with in/out positioners, and two Encore LT manual guns. All of the guns are fed from an Encore™ powder feed center. Due to the large size of the parts, the ColorMax systems at Miller Welding were custom built to accommodate larger than usual part openings. Therefore, color change time takes a little bit longer than normal, roughly 13-15 minutes, which is still very fast considering the size of the systems.

Miller Welding runs two shifts per day, five days per week. “We have about thirty colors in total and do about 5-10 color changes per shift,” explains Mike Repine, paint line manager.

Herr Industrial in Lititz, PA provided the process equipment for the systems at Miller Welding. A power and free conveyor carries parts to be coated through an 8-wheel auto blaster followed by a 5-stage washer. The parts then enter the dry off oven before entering the Nordson ColorMax systems for powder coating. After powder coating, the parts cure in one of two gas convection ovens. “Part identification is done through a bar code reader. It allows us to know where the part is located in the process line at any given time,” says Miller Welding employee Kenny Lindermuth.

Miller Welding is not making tiny widgets that can be easily processed. They produce large, heavy, metal fabrications that are complex in shape and extremely difficult to process.



Miller Welding & Machine Co., Made in America.

“The employees make it appear easy and almost effortless,” Nordson’s Binder says. “Processes run like clockwork and every step is meticulously monitored. If anyone thinks that ‘Made in America’ is a dying notion or thing of the past – then they’ve not visited Miller Welding. Each and every Miller Welding employee I spoke with had excellent knowledge of the production processes and equipment within the facility. Quality at its highest possible level is a core value that every employee appeared to share.”

For more information on powder coating technologies from Nordson, call 1.800.433.9319.

For more information, speak with your Nordson representative or contact your Nordson regional office.

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