

Sample Processing Woos Reluctant Customer

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We recently delivered an automated cabinet that proves persistence pays. A manufacturer needed to clean and etch parts made from exotic metal. As with many customers, these folks asked that we not divulge their proprietary processes, so I can't describe their application for these parts in any detail. The parts are flat and up to about four feet by four feet square. Some are expanded metal; others, solid sheets. They range in thickness from sheet metal to 6 inches. Some require a specific Ra finish, others just need a rough surface without distorting the part's shape.

The customer's bad experience with a competitor's blast cabinet left them with serious doubts about accomplishing all of these goals with automated blasting. This was a new application, and they wanted to get everything perfect.

We processed hundreds of parts and sent them to the customer for evaluation. Along the way, we discovered a few things about the parts even the customer did not know – including learning that the manufacturing process left one side of the thin metal part with more residual stress than the other. (This revelation came after some trial and error and more than a little gnashing of teeth. To keep these parts from curling, we raised the blast pressure on one side and slightly offset the lower-pressure guns blasting the underside. Then we had to ensure we inserted the part with the same side up each time.)

Over the course of 18 months, we conducted eight separate sample processing runs, involving more than 50 machine setups and dozens of media changeovers. Eventually, we determined that the parts would require four distinct gun setups, special parts handling for the thin parts, and three sizes of aluminum oxide media. What the customer needed – four automated blast systems – was beyond their budget.

The Solution

In past columns, I've talked about the need to start with reasonably consistent parts to get efficient automated blasting. While we will gladly design one machine that automatically adapts to each individual part, most customers would not be so glad to pay for such sophistication.

Working closely with this customer gave us a good idea about their needs, their capabilities, and their willingness to reconfigure the system for different parts. They purchased a versatile ZERO Automation cabinet with 20 suction guns, split belt conveyor, media reclaimer, RPH dust collector, and an elaborate media separation system.



Herb Tobben creates solutions to customer problems at ZERO's Sample Processing facility.

The split belt allows simultaneous blasting from above and below, while hold-down fixtures and the slightly elevated blast pressure from above keep the parts firmly in place. To prevent marring the part, the urethane conveyor belts have a rounded profile that minimizes the contact area.

The 3,600-cfm media reclaimer separates the good ALOX from the dust and fines. The cleaned ALOX travels through a six-screen vibratory separator. The now properly sized ALOX particles flow into one of three storage hoppers. Each hopper has its own set of 20 metering valves, so the customer can select fine, medium, or coarse media to blast.

A special hopper adds fresh media as needed.

An exit vestibule in the blast enclosure uses fixed brushes, pull-through airflow, and blow-off nozzles to remove dust and media from the parts. All electrical controls are mounted in a freestanding NEMA 12 enclosure.

And now for the blast parameters – Separate pressure regulators control the upper and lower banks of automatic guns. The customer can raise or lower the gun arrays. Simple ball valves activate from one to 20 blast guns. Adjusting the belt speed controls the blast duration.

To help conserve air and abrasive, sensors trigger the blast guns and blow-off nozzles as the part enters the blast cabinet and cycle them off as it exits.

We installed and started up this system last year. Thanks to their early and ongoing involvement, the customer got exactly what they wanted and their engineers feel comfortable making the parameter adjustments they need to adapt the system for current and future needs.

Got a question about peening, cleaning, or sample processing? ZERO can help. Call 636 239-8135 or submit your request online at www.clemcoindustries.com.

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