Adapting to Change Requires Flexibility All Around

Got a question about shot peening, cleaning, deburring, or finishing?

Clemco can help. Call 636 239-8172, or submit your question online at www.clemcoindustries.com, or post your question on our Facebook wall. We're flexible.

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The problem:
My job has changed a lot over the years. It once was that our customer sent me a manually finished part and told me how many more he was trying to finish in the same amount of time through automation. He typically needed a machine to process a single part in very large quantities. Through testing, I figured out the blast media, pressure, and parts handling, and we were done – a machine to handle the process was thus conceived.

Today, my job involves a lot more communication. Both the customer and I learn a lot through discussion and a thorough delving into both their manufacturing process as well as the blasting or peening process as we work through the project together. The problems are more complex because, more and more often, customers have multiple parts to process in smaller batches. Their challenge is to work out their process so that they can adapt one machine to handle all of their parts. More frequently these days, they are operating in a lean environment where cellular manufacturing is becoming more common. They are concerned about part movement, set-up time, and wait time between operations. Their goal is to eliminate overproduction and only produce items when they are needed. If successful, they will produce cost savings and have better control of their operations. It's all a matter of process design.

One particular customer presented a range of parts that were flat and about four-feet square. The parts varied in thickness from sheet metal to six inches thick. Some had Ra requirements, others did not. It was important to avoid part distortion. This project involved sample processing hundreds of parts. We learned that their manufacturing process produced more residual stress on one side than the other. Over the course of many months and more than a half-dozen processing runs, we eventually determined that they needed four distinct gun setups, special parts handling for the thin materials, and several sizes of aluminum oxide media.

The solution:
During this project, the customer and I became very well acquainted. Our goal was to design a process and machine that would be flexible enough for their various parts. On their side, they were willing to adapt their work flow to reconfigure the machine for the four setups needed to accommodate processing all the different parts.

The automated machine they purchased had 20 suction nozzles, a split-belt conveyor, a media reclaimer, reverse-pulse cartridge-style dust collector, and an elaborate media separation system. The electrical controls were mounted in a free-standing NEMA-12 enclosure. The split-belt allowed simultaneous blasting from above and below, while hold-down fixtures and slightly elevated blast pressure from above kept the parts in place. To prevent marring any of the parts, a unique urethane conveyor belt minimized contact with the part.

A 3600-cfm reclaimer was used to separate good alox from dust and fines. And for the three sizes of media, the alox travelled through a multi-deck vibratory separator into three separate storage hoppers according to size. Each hopper had 20 metering valves allowing operation as needed for whichever setup was employed. A media-add system replenished the supply of properly-sized media on demand.

Separate pressure regulators were provided to control the upper and lower banks of automatic guns, which were adjustable. Individual valves controlled the 'on' and 'off' of each blast gun, and variable belt speed controlled the blast duration. To keep the work area clean and minimize waste of compressed air and blast media, the machine had an exit vestibule with fixed brushes, pull-through air flow, and blow-off nozzles to clean the parts. Sensors triggered the blast cycle upon entry, and the blow-off nozzles prior to exit.

With every specially engineered machine, a critical component we deliver is training. With their involvement from the beginning, the engineers were pleased with the versatility of the machine. They were confident that following operational and maintenance training, their process operators would be sufficiently multi-skilled for the range of tasks involved in their work cell. And that they would be comfortable adapting to future process changes their production line required. ●