Blasting High-Precision Tools for High-Precision Surgery

Got a question about shot peening, abrasive blasting, or sample processing? Clemco can help.

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Problem:
Having an operation makes most people a little anxious. But knowing the surgeon is skilled and the instruments precise can allay fears, at least a little. For a good outcome, the surgeon and the hospital must do everything possible to cure the patient and avoid post-surgical infection. Today, most surgical instruments are single-use, disposable tools. The practice of using instruments only once has dramatically increased demand for these tools and requires incredible production capacity.

I recently worked with one such manufacturer of very high quality medical instruments whose demand for precision exceeded almost any other application I've worked with, even compared with shot peening applications. Most of you know the stringent requirements associated with shot peening specifications, so this application was very special.

The company makes laparoscopic instruments, which are fabricated stainless steel tubes of very small diameter, with wall thicknesses between .010" to .017", and some are over a foot long. The purpose of blasting is cleaning and deburring the parts. While blasting produces acceptable parts, the inherent issues associated with blasting are warping, distortion, and part growth. Due to high production demand, the company wanted to control the process themselves. They had experimented with sending the parts to a job shop and using a mix of glass bead and aluminum oxide, but they were dissatisfied with the level of rejected parts and they felt they were wasting time shipping parts back and forth and waiting on new batches of parts. They strived for the right equipment solution, and the benefits it would bring to their operation.

Solution:
Their local ZERO distributor worked closely with them to articulate their needs and specify the challenges to be overcome. Once in the lab, we determined that we could produce good parts with 120-mesh aluminum oxide in a suction-style (venturi-style) indexing turntable blast cabinet, equipped with vertical oscillation. The machine had two blast stations, each with 4 blast guns, and could process six parts at a time.

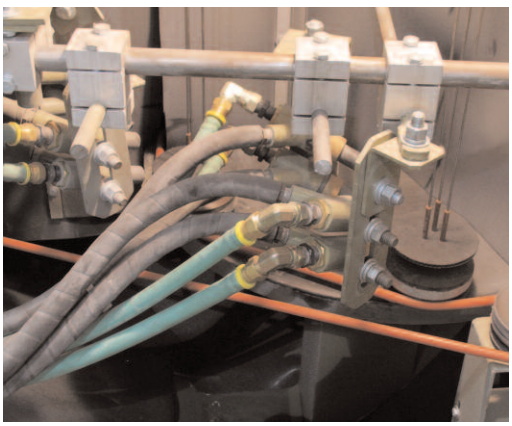
The most challenging aspects of this application related to its very sensitive setup requirements. The customer required a very high degree of precision to maintain extremely tight tolerances due to the thinness of the stainless steel tubes. Each part had to be processed identically for a repeatable outcome. It was therefore critical that the position of the guns, the blast angle, the part rotation speed, and the media flow were identical for both stations.

In addition, maintaining the working media mix was critical. To accomplish this, an automatic media-add system was included so that small amounts of new media would be added at a determined interval to keep the media size consistent. The primary goals were repeatability and consistency.

The company puts the parts through a 100% inspection process that involves visual inspection and a specialized test bench to check concentricity tolerances and length to ensure that the parts meet their specification.

In the end, we were able to help the customer reduce cost by processing the parts in-house. Not only are they able to meet production demands more quickly, but also they are able to control variables, immediately respond to process issues, and eliminate the delays associated with batch processing at a distant location. They are saving time, saving money, and achieving an extremely high level of quality, making us proud to have contributed to this successful project. ●

With two stations and fixtures to hold multiple parts, this semi-automated machine processes thousands of parts per day.



Special gun set up, satellite rotation speed, and media mix provides precise repeatability and consistent parts.