MANUFACTURING TOPICS

Elmer Smith | Process Engineer | Spirit AeroSystems

Advice for New Shot Peening Technicians

and the people that hire them

Elmer Smith, a Process Engineer with Spirit AeroSystems in Wichita, Kansas, exemplifies the best of the manufacturing workforce. He is an experienced technician that enjoys his job and does it well. His advice to shot peening operators addresses an important issue to everyone in manufacturing: the transfer of knowledge from a skilled workforce to new employees.

ELMER SMITH is a Process Engineer for one of the largest non-OEM designers and manufacturers of aerostructures for commercial aircraft—Spirit AeroSystems in Wichita, Kansas.

The Wichita site has manufacturing operations for all Boeing models now in production, as well as the Bombardier CSeries and the Mitsubishi Regional Jet; Maintenance, Repair and Overhaul (MRO) support and services; and other manufacturing, administration and support facilities.

Elmer has been with Spirit for over 39 years and has worked in their shot peening division for 35 years. He is one of nine certified shot peening technicians that operate four wheel- and air-blast machines. To be certified, a shop peening machinist must first take classroom training, then he receives on-the-job training. When the on-the-job training requirements are met, he is certified by Spirit's training department.

Elmer and his department are responsible for every component that needs to be shot peened in the Wichita facility. "We peen everything that needs to be peened that we can fit in our work zone," he said. A typical workday for Elmer starts with setting up a shot peening machine to process a part and then troubleshooting any concerns that come up during the peening process. He oversees the machine operators and the process, and will run the machines, when needed. He is responsible for meeting Nadcap requirements and, if it is a new procedure, he will develop the technique sheets. He also participates in Research and Development relevant to his department.

An Interview with Elmer

The Shot Peener staff is very appreciative to Elmer and Spirit's Corporate Communication staff for letting us pull Elmer from the busy shop floor to answer a few questions for us.

The Shot Peener: What do you like best about your job?

Elmer: I like to set up complicated parts that require shot peening to specific requirements. I also enjoy the opportunity to meet people that I respect because of their knowledge in surface enhancement.

The Shot Peener: What resources do you depend on when you have a question or problem with a shot peening job?

Elmer: I can get answers from our engineering department or the customer's requirements.

The Shot Peener: What additional resources would be helpful to you?

Elmer: The testing results from various metals peened with different media by a university or engineering lab. We could use the results as reference when making a new setup and save a lot of time.

The Shot Peener: You mentioned that you're responsible for developing technique sheets. Tell us more about them.

Elmer: Technique sheets help new and experienced operators process parts according to customer specifications, Nadcap requirements and our own specs. I call them the "Bible of Parts Processing."

The Shot Peener: What kind of training did you receive when you started in Spirit's shot peening division?

Elmer: I was trained by a shot peening operator who had 20 years of experience in all aspects of shot peening. I'm always reading books and magazine articles on advancements in surface enhancement. I read *The Shot Peener* and when you Google "shotpeen," it opens up a whole world of information, even YouTube videos.

The Shot Peener: Are you responsible for training new employees?

Elmer: Yes, but we prefer to do it as a group of senior operators. We believe in teamwork!

The Shot Peener: Spirit AeroSystems is a world leader in the aerospace industry. Do you ever think about your contribution to shot peening and the role shot peening plays in the integrity of aerospace components?

Elmer: From Engineers to machine operators, we are all held to very high standards by our Quality Assurance staff. We shot peening operators especially hold ourselves to a very high standard because if the component is not processed per customer specifications, if something goes wrong and that part fails, lives can be at stake. That is not an option!

The Shot Peener: What advice would you give to a new shot peening operator?

Elmer: Learn from the old dogs and read any research you can get your hands on to improve the process. Never be satisfied with "that is how it has been done for years." If you see something that can help the process, speak up and run tests to show the improvement. Always look for better quality within the specifications you are given by the customer.

KNOWLEDGE TRANSFER
***Knowledge transfer* means replicating the expertise, wisdom, and skills of critical professionals in the heads and hands of their coworkers.[1, 2]**

"Old Dogs" and Knowledge Transfer

Elmer said that it's important for new employees to learn from the "old dogs." He was fortunate to begin his career with the help of an experienced shot peening operator. But he makes another good point: "Never be satisfied with the way things have been done for years." Relying on the current workforce to properly train new workers isn't 100 percent reliable. What if the "old dog" has performed a process improperly for 20 years?

From our conversation with Elmer, we can see several steps that Spirit has taken to protect the integrity of their shot peening processes:

1) New operators must pass a two-step certification program that includes classroom training and on-the-job training.
2) Elmer trains new employees as part of a team of senior machine operators. A team approach reduces the likelihood of passing along poor work habits and it distributes training responsibilities among the staff.
3) Process engineers are responsible for developing technique sheets of successful setups. Technique sheets are required for Nadcap and other audits, but they are valuable knowledge transfer tools, too.

The Wichita, Kansas facility is just one of many Spirit AeroSystems facilities around the world and Spirit has resources that are out of the reach of most manufacturers. In addition, Elmer has taken the initiative to keep abreast of innovations in surface enhancements, and not all employees are that motivated. But if this claim is true, that few organizations can say with any degree of certainty that they will have the workforce they need to hit their strategy 1-3 years from now,[1] every manufacturer needs a knowledge transfer plan. Maybe your shop floor is populated with young workers, not old dogs on the verge of retirement. You're still at risk since younger workers move on to new jobs more frequently than older workers.

Fortunately, the basis for safeguarding the future of your business is similar to creating a quality shot peening process: Training, documentation, quality control and the instillation of pride in a job well done.

[1] Knowledge Transfer - Preserving Your Secret Sauce. The Steve Trautman Co.

[2] Knowledge transfer has a different meaning in the United Kingdom. In the UK, it is defined as the means by which expertise, knowledge, skills and capabilities are transferred between academic institutions and businesses.