

How to Achieve Blast Cleaning Process Control with Almen Products

Many of our readers use Almen strips and Almen gages to measure the intensity of their shot peening processes. It could come as a surprise, however, that the same tools and techniques are used to make blast cleaning operations more productive and profitable. (Thank you, Kumar Balan, for pointing this out in your “The Top Five Things My Customers Are Doing Right” article.) The following is based on an article first published in the Summer, 2001 issue of **Abrasive Blast Cleaning News** by Jack Champaigne. Here Mr. Champaigne outlines how Almen products can monitor the blast cleaning procedure.

IS THERE A SPC FORMAT that allows you to monitor the blast cleaning process? There sure is. And it's simple and economical to do. Some people start their SPC program by keeping a record of motor Amps and that is a good beginning. However, tracking motor Amps won't tell you if the wheel target or hot spot pattern has changed. It also won't detect problems with the media such as a poor working mix or the consequences of using a different hardness or size of media.

A far better method of SPC control is to run an Almen strip on an Almen holder mounted on a sample part through the blast stream. Since the condition of the wheel blast machine and the media affect the blast stream intensity, the Almen strip will react the same as it does during a shot peening procedure—it will exhibit a slight curve that can be measured on a #2 Almen gage. This curvature measurement can be recorded in a SPC chart.

Here's a complete list of the factors that will affect the curvature of the Almen strip:

■ Targeting (hot spot location)

- Control cage wear
- Impeller wear
- Blade wear

■ Media quality

- Contaminated working mix
- Incorrect media hardness
- Wrong shot size

■ Cleaning rate

- Incorrect exposure time
- Incorrect media flow rate (i.e., motor Amps)

It isn't practical to constantly monitor each of the above items. You can, however, use an Almen strip twice a day to quickly spot a change in the curvature measurement.

Ideally, the curvature measurements should be the same every day. However, as wheel parts wear, the hot spot pattern shifts and the curvature reading will change. As mentioned before, a substitution of shot size or hardness, or even the conveyor speed, will also cause the Almen strip reading to change. In fact, the nice thing about this technique is that changes in the most important elements of a controlled blast cleaning procedure will be detected by the Almen strip readings.

Again, changes in the process, such as using a different media or the slow wear of equipment components, will affect the readings. Here's a checklist of problem areas.

■ Shot/grit

- Working mix
- Hardness
- Contamination
- Availability (hopper is clogged or empty)

■ Targeting

- Wheel hot spot pattern shift
- Change in part placement

■ Blast exposure time

- Conveyor speed
- Cycle time setting

■ Motor Amps

- Ammeter calibration
- Media flow rate

■ Wheel speed / Speed setting

As demonstrated, the blast cleaning process can be quantified and part of the SPC program. The Almen strip and gage are valuable resources for your ISO 9000 quality program and SPC program. ●