

# THE SHOT PEENER

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## Shot Peening Procedure

by Jack Champaigne

Things aren't the way they used to be. And they never were. That's just another way of saying that times change. With the changing times comes new performance requirements. Some changes are due to specification revisions. Some are economically driven for lower production costs or reduced liability exposure. Whatever the nature of the change, certain guidelines usually persist.

Questions like, "Why do we have to do anything at all? Why do we have to do it this way? Why do we have to do it now?" will often outline a course of action.

The manufacturing process can benefit substantially by focus on three areas:

- a. Product uniformity
- b. Adherence to standard practices
- c. Real-time process control

Consistency is the glue that attaches credibility to standard operating procedures. If something is worth doing, then it must be done well.

Having the desire to be consistent is only the first step. Actions must not only be efficient, they must be effective. This requires that a plan of action must be appropriate. The confirmation of achieving the goals should be available in realtime. Inspecting for quality as a last step is no longer an acceptable method of monitoring the process. Those that know build quality into the product. They don't wait to test for it afterwards.

In the shot peening practice we see two definite trends. The first is from the specifications influence. Several of the larger U.S. aerospace manufacturers are revising their procedures to utilize state of the art technology. ASTM is actively revising their peening standards, as is the AMEC committee of SAE. The U.S. military specification was recently (June, 1989) revised to reflect these trends (see article on page 5).

The automotive industry, always striving for more performance without the penalty of increased size or weight, is very active in seeking better peening methods. The economic motivation in this industry is tremendous. Higher processing rates, at lower costs, producing durable goods that outlast the warranty period; these concepts attract attention.

Electronics Incorporated has produced a short guideline that can be used as a model for the shot peening process. The steps included in the procedures are as follows:

1. Define Peening area
2. Specify Peening intensity
3. Specify Shot Size and Hardness
4. Verify Shot Quality
5. Specify Stand-off and Impact Angle
6. Specify Motion Requirements
7. Establish Correct Targeting
8. Establish Peening Intensity
9. Establish Cycle Time
10. Record Process Parameters (and Limits)
11. Perform Peening
12. Evaluate Shot Quality
13. Perform Intensity Verification
14. Establish SPC Control Charts
15. Post Peening Heat Limits
16. Out-of-Control Remedies
17. Fire Hazard
18. References