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Turning Technology into Useable Tools

New technology is changing the shot peening community. We've watched laser shock peening make significant contributions to very deep compressive stresses on blade leading edges. We've also seen a serious reduction of sliding friction due to Fine Particle Shot Peening and the Fine Particle Shot Peening Society in Japan. Rotary Flapper peening has been around since the 1960s having been developed for helicopter repair in Vietnam. Now we see some techniques to accomplish peening of small areas without the rotating flaps. Sonats in France has developed a unique ultrasonic vibrating plate that will agitate small peening balls which will strike your target surface with sufficient impact to create a large range of compressive stresses. This equipment is available in either stationary or mobile format. Sonats also has a device that uses ultrasonic vibration to activate a series of small needles; a modern version of pneumatic needle peening.

Along with new technology comes the challenge of “how do you assure that the performance is appropriate and repeatable?” The answer is simple. You turn to SAE and the AMEC sub-committee on surface enhancement, created last January at AMEC's annual meeting in Asilomar, California. The two-day conference was attended by 29 charter members. This year, during a two-day meeting hosted by Lockheed Martin in Marietta, Georgia, the 19 members who attended the special committee were able to address a number of outstanding issues. These need action by SAE Aerospace committee but here are some of the topics that were discussed.

- AMS-S-13165's cancellation notice was revised to allow continuation of existing technical plans already approved and in service.
- AMS-2430 was revised to accommodate technical plans previously approved in AMS-S-13165.
- AMS-2430 has multiple revisions, still in progress, to continue to improve the control of the peening process.

- AMS-2431 has multiple revisions to accommodate differences in media size inspection when using sieve shaking devices, adjustments to several glass bead sizes, addition of several ceramic bead sizes, introduction of a new low sodium glass bead of high durability for fine particle shot peening, and many more issues.
- NEW: An AMS version of a flapper peening specification intended to displace the MIL-R-81841 specification which has several erroneous concepts and requirements.
- NEW: An AMS specification for ultrasonic activated ball peening.
- NEW: An AMS specification for ultrasonic activated ball peening media.
- NEW: An AMS specification “Word for Word” adoption of the recently cancelled MIL-W-81840 spec “Wheels for use with Rotary Flap Peening”.

If you wish to become active on this committee, you can join with the other 62 leading experts on shot peening by contacting Al Patterson at Lockheed Martin at a.patterson@lmco.com.

The surface enhancement meetings convene in January and August. Not all of the traction on specifications takes place at the AMEC meeting. Many of the industry and proprietary specifications refer to the SAE “J” series of standard practices. On October 14th the SAE Fatigue Design and Evaluation Committee Surface Enhancement Division, custodian for the “J” practices, will meet for its semiannual meeting at the University of Toledo to discuss changes to J442, J443, J444, J2277 and J2441. To participate in this committee, email me at jack.champaigne@shotpeener.com. Applicants do not have to be U.S. citizens and you do not have to join SAE (but joining SAE is encouraged). ●