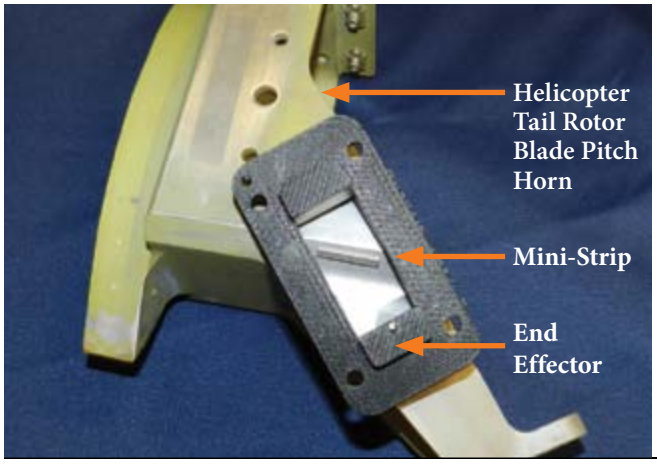
Mini-Strip Research Presented at U.S. Shot Peening Workshop

KELLY MCCLURG presented the results of the first phase of her mini-strip validation program at the 2013 U.S. Shot Peening Workshop. Ms. McClurg is a Materials Engineer for Avion Solutions, Inc. in Huntsville, Alabama. Avion Solutions provides specialized engineering, logistics, software development, and technical services to the U.S. Army's aviation community.

Kelly McClurg
Materials Engineer
Avion Solutions Inc.

Ms. McClurg was introduced to Almen mini-strips when a colleague brought her a sample of the strips from an Army Aviation Association of America convention. Mini-strips are 1" x .125" (25.4 mm x 3.175 mm) Almen strips that can be attached with double-sided tape directly on a test component or simulated fixture. Their size makes them ideal for measuring intensity in small or hard-to-reach areas like dove-tail slots in jet engine disks, gear roots, and the internal bore of springs, without making a complicated test fixture. Avion is currently using shaded strips which involves a laborious masking process. Ms. McClurg recognized that the mini-strip could quickly and accurately obtain intensity measurements. "I conducted this study to get a better understanding of intensities in the small areas of a component. When using shaded Almen strips, we are only getting an arc height. If we change the parameters of the shot peening procedure, then this arc height is no longer a confirmation of intensity as the arc height can fall anywhere along the saturation curve," she said.

Avion utilizes ultrasonic shot peening with the portable SONATS StressVoyager® for small, localized repairs on helicopter components. (Avion Solutions has been validated by the U.S. Army as an Approved Source for the Ultrasonic Shot Peening Process.) Avion creates enclosures called "end effectors" that mate the sonotrode head of the Stresstonic to the section of a component that receives the ultrasonic treatment. The end effector becomes a small peening chamber around the repair area. "We need to make a new end effector for each area of the component to be peened. When we change the design of the end effector, we are changing a shot peening parameter and we need to validate the intensity because of the changed parameter," said Ms. McClurg. "Mini-strips offer a fast and accurate solution."



Ms. McClurg's presentation at the 2013 Electronics Inc. U.S. Shot Peening workshop was titled "Mini-Almen Strips: A Promising New Technology." Her presentation included:

- Development of a correlation between full-size Almen strips and mini-strips arc heights
- Performance comparison between full-size Almen strips and mini-strips
- Intensity validation study along altering geometry (a helicopter tail rotor blade pitch horn was used)
- Mini-strip saturation curve study
- The benefits of using mini-strips including validation of intensity on an angled incline, elimination of complex and costly test fixtures, and intensity confirmation available in areas unattainable with full-size Almen strips

The convenient and easy-to-use mini-strips can be the ideal complement to Avion's portable ultrasonic shot peening processes. "The results of this first study are very promising," said Ms. McClurg. "If we continue to see good results through the conclusion of the study, mini-Almen strips will replace our use of shaded Almen strips and allow for increasingly accurate measurements of intensities in small areas, rather than just arc heights."

Avion Solutions has sent these findings to the U.S. Army for approval to use mini-strips in qualifying intensity on a repair for a Critical Safety Item.

MORE INFORMATION

Almen Mini-Strips: Visit www.electronics-inc.com or call Electronics Inc. at 1-800-832-5653 or (574)256-5001

"A Promising New Technology": Download the PowerPoint presentation from the library at www.shotpeener.com

Avion Solutions: Visit www.avionsolutions.com or call (256)327-7144