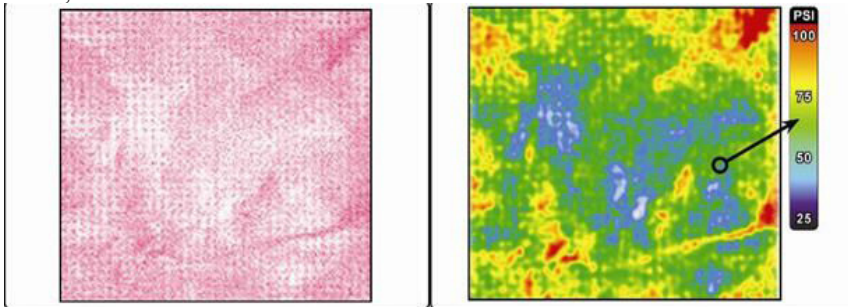


INTERCONNECTION WORLD™

Six steps to ensuring optimal ultrasonic-weld strength

Feb 4, 2010



Horn's Pattern on Pressurex® Film reveals Contact Flaws

Pressurex® Pressure Profile after Image Analysis

Sensor Products recommends the use of pressure-indicating sensor film during ultrasonic welding. According to the company, use of its Pressurex brand pressure-indicating sensor film is part of an economical and precise procedure that will ensure weld optimization and prevent defects.

“Ultrasonic welding is a joining technique that uses high-frequency ultrasonic acoustic vibrations to create solid-state welds,” the company explains. “To optimize the weld and prevent defects, the horn and anvil must be precisely aligned during setup so that the horn exerts uniform pressure across the entire weld area.” That’s where the company’s Pressurex pressure-indicating sensor film comes in.

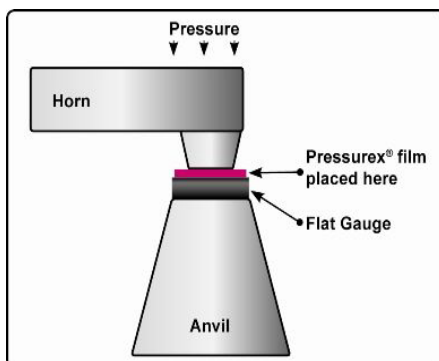
The film reveals the distribution and magnitude of pressure between any two contacting surfaces. When placed between the horn and the anvil of the ultrasonic bonder, the film instantaneously and permanently changes color directly proportional to the actual pressure applied, Sensor Products says. The company adds that the precise pressure magnitude (measured as PSI or kg/cm squared) can then be determined easily by comparing color variation results to a color-correlation chart that is conceptually similar to interpreting Litmus paper. If the user desires, the film can be further analyzed. Pressurex is 4 to 8 mils in thickness, which the company says enables it to conform to curved surfaces.

The images at the top of this page are pressure maps showing pressure variations across the weld zone that can result in less-than-optimal weld strength. Such variations are generally caused by a lack of alignment between the horn and anvil or by dirt or residue on the horn, Sensor Products explains. The company offers the following tips on how to fix these conditions during setup.

1. Turn on the ultrasonic welder and set the supply air pressure.
2. Place a flat gauge on the anvil’s contact point to simulate the thickness of the parts to be welded.
3. Lower the horn onto the flat gauge to calibrate the height setting.
4. Align the horn tip and the anvil.
5. Place the pressure-indicating sensor film on top of the flat gauge and lower the horn to exert light pressure on the film.
6. Adjust the horn tip as needed through repeated setups with the sensor film.

The setup is correct when the pressure density on the film is uniform in color.

Sensor Products adds that the routine use of its Pressurex film during the setup of ultrasonic welders helps ensure proper contact pressure and alignment between the horn and anvil, which results in welds of greater bond strength and aids in reducing rejected product and lowering base factory cost.



Using Pressurex® for Setup in Ultrasonic Welding