

UNDER PRESSURE

Sensor film maps contact surface-pressure distribution for leading load cell manufacturer

Pressurex[®], a thin, flexible film from Sensor Products Inc., is a versatile NDT tool for quality control and machine-component inspection. Its ability to easily and rapidly show inconsistencies in surface pressure between mating or contacting surfaces has lowered scrap rates and assisted in the design and manufacture of many industrial and electronic products.

PROBLEM

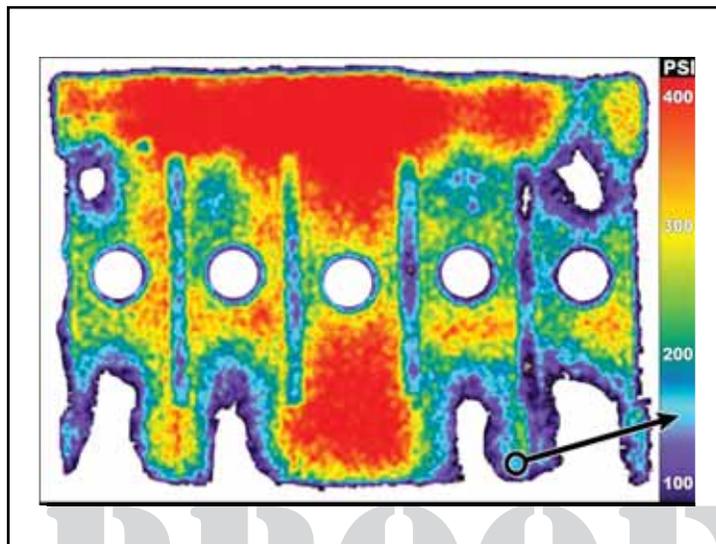
Futek, a leading U.S. manufacturer and supplier of load cells, torque and pressure sensors, was having difficulty assembling some of its load cells to its specifications. By performing several tests and controlling for different variables, fluctuations in clamping pressure were found to be a significant factor.

SOLUTION

Futek's sensors incorporate metal foil strain gauge technology. The adhesive they use to bond the gauges to their sensors requires a clamping pressure of 50-75 psi. However, James Meiselbach, a Futek mechanical engineer, said that when they used Pressurex[®] film, pressure fluctuations of 50-200 psi or more in some production runs were achieved. This led Futek to use the film to help redesign several of their clamps to incorporate silicone die springs to more precisely regulate the pressure.

"A sample pack of Pressurex with film that revealed different surface-pressure ranges allowed our production to continue," Meiselbach said.

The film reveals surface pressure of 2-43,200 psi (0.14-3,000 kg/cm²) and requires no training or instrumentation. It can assess surface contact inconsistencies in virtually any industrial or elec-



tronic application, including gaskets, clamps, bolted joints, connectors, heat sinks, heat-sealing elements, welding heads, and plastic and composite manufacture.

Meiselbach found using the Pressurex film to be a simple procedure. To measure the surface pressure of a clamp around the outside of a load cell, he cut the film to the configuration of the clamp surface area, placed it between the clamp and the load cell, applied force, unclamped it, and removed the film. He then compared the film, which changes color depending

on how much pressure is exerted, to an accompanying color-calibration chart.

Meiselbach became aware of Pressurex while working for an aerospace company. "We were having a problem with the main rotor blade of a helicopter," he said. "Interference was causing a fatigue crack in one of the inner spar tubes of the rotor blade. We put a large sheet of Pressurex in the bonding tool, bagged it up and pressurized it in the autoclave. When we removed the film, we were able to identify the exact amount of pressure causing the crack."

ABOUT THE COMPANY

Established in 1990, New Jersey-based Sensor Products Inc. is a world leader in the manufacture and distribution of film and electronic tactile pressure-sensing solutions. The company provides in-house and on-site stress- and pressure-mapping analysis, as well as consulting services and regional technical seminars.

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