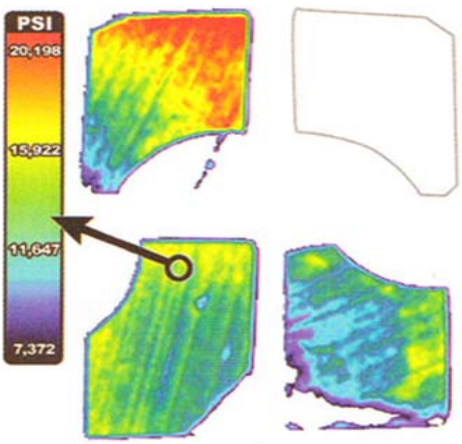
Tooling Update

Pressure-Indicating Film Reduces Press Setup Time and Maintenance Costs



This pressure image of the progressive die reveals that three of the four bumper blocks experienced pressure of 7000 to 20,000 psi, while one block failed to make contact, requiring a shut-height correction

Pressurex, a thin, flexible, Mylar-based sensor film developed by Sensor Products Inc., Madison, NJ, instantly captures and permanently records pressure distribution and magnitude between any two mating surfaces. In the pressroom, stampers can use the film—which reveals surface pressure from 2 to 43,200 psi and comes in eight pressure ranges—to pinpoint important pressure points that affect tool balancing, and key pressure areas that lead to die wear, to reduce long-term production-maintenance costs.

Proving this out is Shawn Eeles, general manager of Five Star Tooling, a progressive-die manufacturer in Ontario, Canada. Eeles, along with Mirco Graenert, of Mirco Graenert Consulting Inc., Newmarket, Ontario, put Pressurex through a 400-ton progressive-die trial to analyze its capabilities. They found that the film works as-specified in forming and piercing operations, identifying pressure points affecting tool balancing and die maintenance.

Five Star Tooling applied Pressurex to a 5-ft.-long progressive die used to stamp a structural automotive part. It applied the film between mating cutting and forming components as well as to bumper blocks, revealing local pressures that can be modified to optimize die balancing.

"Accurately balancing the die by obtaining pressure readings from the various operations results in higher quality dies and lower die-maintenance costs," says Graenert. "The restrike station, for example, often exerts a concentrated force near the exit side of the die. Unbalanced pressures can cause the die to 'kick,' causing premature fatigue, excess wear and subsequent cracking or breakage of die components, This can be minimized by using the pressure readings from the film and varying stripper pressures to balance the tool."

Pressurex, similar in thickness to ordinary paper, changes color directly proportional to the amount of pressure applied. Metalformers can determine pressure distribution by comparing the exposed sensor film to a color-calibration reference chart. Or, Pressurex® readings can be further analyzed using Sensor Product's inhouse imaging service, or by leasing or purchasing its Topaq® tactile-force-analysis system.

"The test proved," says Graenert, "that bumper blocks, areas near cutting edges, gradual forms, trim-cutting edges and restrike stations all can be thoroughly analyzed, giving vital information that enables better die balancing. For some dies, these pressure values, particularly combined with die knowledge, reveal what is 'unseen' and allow dies and other mechanical systems to be fine-tuned. This reduces their lifecycle maintenance cost and improves part quality and consistency."

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