FRAUNHOFER IWU

PRESS RELEASE

GreenHiTemp: Thermography Reliably Visualizes the Quality of All Parts in a Batch with No Additional Effort

Quality control in hot forming can often only begin when the workpiece has cooled down. Conventional optical quality assurance methods are limited when dealing with hot parts; as the temperature of the workpiece rises, the blurriness in determining its geometry increases. This finding leads to high scrap rates and unnecessary costs due to process-related quality defects. The GreenHiTemp project offers a promising solution with thermal imaging, enabling reliable predictions during the process instead of relying on post-production checks.

The Fraunhofer IWU, in collaboration with InfraTec GmbH, is researching the advantages of thermography in the context of press hardening. Press hardening combines the benefits of heat treatment and forming. It allows for the production of high-strength yet lightweight body parts, such as B-pillars in automobiles. The temperatures determined through thermal imaging provide reliable insights into the workpiece's quality.

100 Percent of Parts to Undergo Quality Control Without Time Loss

With a properly trained AI model, hardness predictions of the component are possible. Production workers can use a simple color scheme to identify any areas of the part that may be faulty or to determine whether the entire component can be classified as "good" or "defective" once the forming process is complete. This early transparency makes trends visible, allowing for timely interventions in the manufacturing process.

A Quick Glance at the Monitor Replaces Lengthy Testing Procedures

Existing tests, for time reasons, must rely on spot checks. Even with a fully automated testing process, it would take about seven minutes to process 88 measurement points; in some cases, only destructive testing would be possible. Any error detected may lead to discarding an entire batch for product safety reasons. With GreenHiTemp, the share of scrap decreases significantly, leading to a much more resource-efficient and effective production process.

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DigiRess

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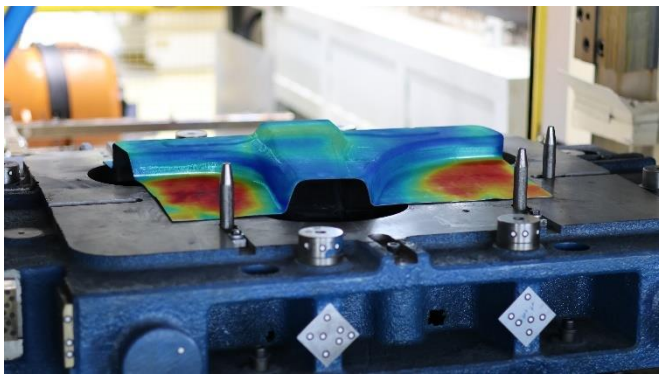

Fig. 1 Thermographic overlay of a press-hardened B-pillar base - this component connects the B-pillar of a vehicle (where the front door latches) to the floor assembly. The temperature image, combined with the image of the flat sheet metal (see Fig. 2), allows for the prediction of the hardness and, thereby, the quality of the part.
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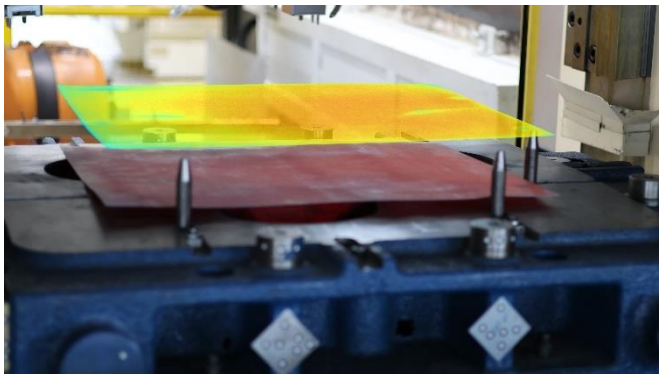

Fig. 2 Still glowing flat sheet metal before the forming step, with the thermal image projected above it.
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