

Press Release

InfraTec GmbH Infrarotsensorik und Messtechnik

Dresden, 2026-08-26

DIECAST-CHECK by InfraTec: Ensuring Thermal Safety in Die Casting Processes **Inline measurement system for monitoring the temperature distribution of the casting mold**

With InfraTec's new DIECAST-CHECK automation solution, users can monitor the temperature distribution across the surface of the die inline. The system detects thermal deviations early on, thereby creating the conditions necessary to stabilize die casting processes, reliably ensure the quality of castings, and reduce scrap.

Unlike spot measurements using pyrometers or thermocouples, DIECAST-CHECK provides a complete thermographic image of the mold surface that shapes the casting ("cavity"). This makes it possible to identify critical areas of the die and make targeted corrections during the ongoing process. The thermographic measurements also provide important data for optimizing the quality of the die cast part and the cycle time of the process.

The recorded temperature data can also be processed for each individual production cycle using AI-based algorithms. This makes it possible to analyze patterns in mold temperature across different batches and, for example, draw conclusions about how to heat the mold more evenly.

Temperature Deviations as Sources of Error in Die Casting

Die casting is a highly productive process for the mass production of components made of non-ferrous metals such as aluminum and magnesium, as well as their alloys. The processes take place within narrow thermal windows and with short cycle times. Even slight temperature deviations on the cavity surface can compromise the quality of the casting. These deviations occur particularly during the warm-up and start-up phases of a system. Reliable inline temperature monitoring is therefore essential for ensuring an efficient process.

Reliable Measurements in Demanding Environments

As part of the DIECAST-CHECK solution, high-resolution thermal imaging cameras reliably detect temperature deviations, even on complex, finely structured components. However, non-contact, area-wide temperature measurement during the die casting process is technically very challenging due to the harsh environmental conditions. To make it easier to remove the component after die casting, the mold is sprayed with a release agent before each casting operation. The optical systems of the thermal imaging cameras used in the immediate process environment must be protected from the resulting spray mist and dirt.

To meet the particularly demanding requirements of this "lubrication phase," a special, highly robust protective housing was developed in collaboration with an industry partner. This housing features a precisely controlled protective flap and an air-purge system that prevents contamination of the germanium protective window integrated into the housing. This ensures the continued functionality of the entire measurement system, and cleaning becomes necessary only after long periods of operation.

DIECAST-CHECK Software: Temperature Monitoring, Alarms, and Process Evaluation

The automation solution is integrated into the die casting cell's process control system via industry-standard interfaces. The DIECAST-CHECK software used is a version of InfraTec's INDU-SCAN software specifically tailored to the monitoring of die casting processes. It delivers data to the higher-level plant control system, displays the process data on a control screen, and stores all measured values.

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Temperature data is automatically collected and recorded after the release agent is applied. The user interface of the DIECAST-CHECK software displays real-time thermal images of the die. Temperature trends over time can also be displayed graphically and analyzed. For analysis, various regions of interest (ROI) can be defined, enabling targeted monitoring of areas that are particularly critical for component quality.

If the temperature of the die measured by the system is within the specified limits, the die cast part produced is classified as “acceptable” and the cycle continues. If the temperature exceeds or falls below the limits, the system triggers an alarm and highlights the affected areas where temperatures are too high or too low. The data are transmitted to the machine control system, which initiates the necessary heating or cooling of the die.

In addition to temperature, the DIECAST-CHECK software monitors other parameters. These include compressed air supply to the camera protective housing, the proper operation of the protective flap, and the need to clean the viewing window.

Learn more about the DIECAST-CHECK solution:

<https://www.infratec.eu/thermography/industrial-automation/process-monitoring-die-casting-diecast-check/>

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About InfraTec

The InfraTec infrared sensor and measurement technology company was founded in 1991 and has its headquarters in Dresden, Germany. The privately held company employs more than 240 employees and has its own design, manufacturing and distribution capabilities.

With its infrared measurement business unit, InfraTec is one of the leading suppliers of commercial thermal imaging technology. In addition to the high-end camera series ImageIR® and the camera series TarisIR® and VarioCAM® High Definition, InfraTec offers turnkey thermographic automation solutions e.g. for industry processes, non-destructive testing and fire detection and prevention.

The Infrared Sensor division produces custom-made components – especially pyroelectrical infrared detectors – for clients worldwide. The product range includes analogue single and multi-channel detectors as well as digital multi-channel detectors (PyrIQ®) and high-performance detectors (PYRONEER®) for analytical instruments. The detectors are used in gas analysis, fire and flame sensors and spectroscopy.

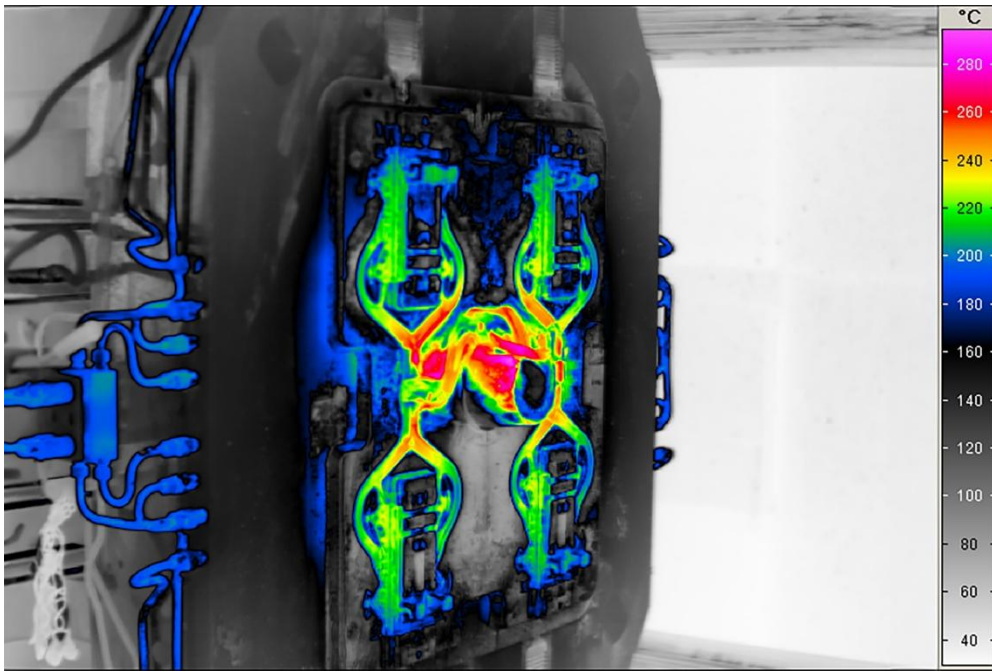
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Pictures:



Thermal image of a die casting mold / Picture credit: © InfraTec



Camera protective housing developed for the DIECAST-CHECK solution / Picture credit: © InfraTec

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