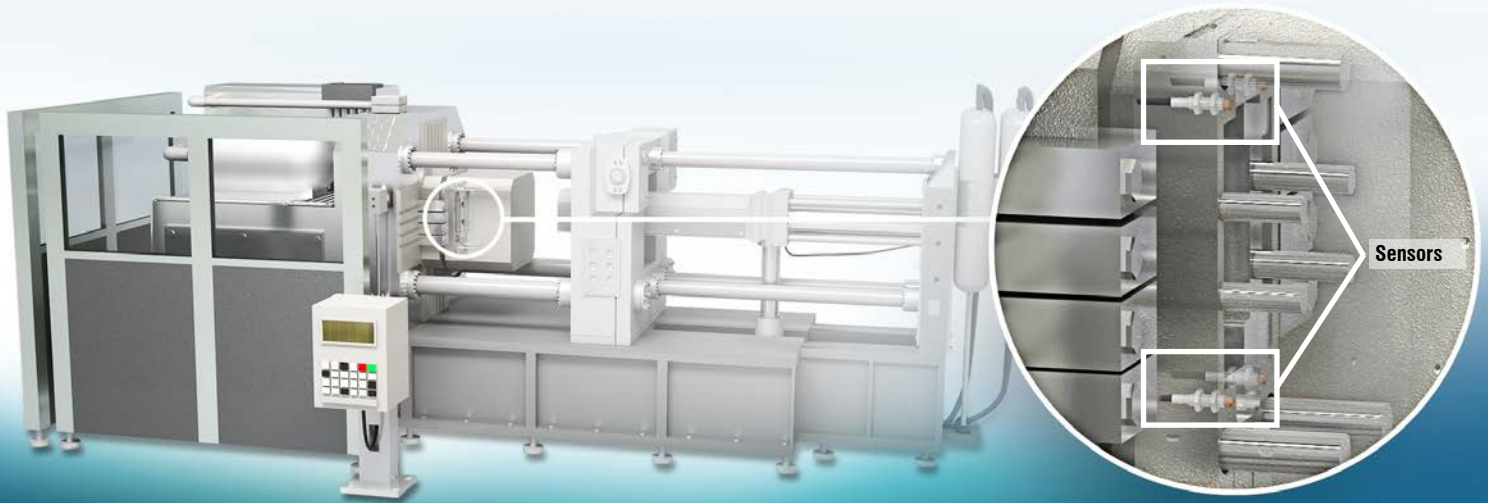




Monitoring mold deformations in aluminum die-casting

In the production of aluminum die-cast parts, liquid aluminum is pressed into a mold under high pressure. The two mold halves are held together with significant force. Despite this high contact force, the tool halves are pressed apart minimally. This process is also called mold breathing. Minimal openings are normal and intended during this process, but if the gap is too large, this causes fraying on the component. These splinters need to be reworked to meet the high quality requirements of the final product. If aluminum residues remain on the tool, they also lead to increased wear, which reduces tool life.

Monitoring tool deformation using inductive sensors based on eddy current enables high product quality combined with improved tool life and reduced rework. Usually, three to four eddyNCDT 3005 eddy current systems are used to ensure consistent gap monitoring.

A system consists of a compact and robust controller, which together with the cable and sensor form a solid unit. The integrated system design increases robustness and resistance to external factors, making the system insensitive to harsh industrial environments with high temperatures, dust, dirt or pressure, and delivers accurate results regardless of the environment. Due to the compactness of the eddyNCDT 3005 system, subsequent integration into an existing machine is possible at any time.

Requirements for the measurement system

- Resolution: 1 μm
- Linearity: 5 μm
- Short shot time requires high speed measurements

Ambient conditions

- Sensor is exposed to temperatures > 100 °C
- Vibration
- Sensor might be exposed to pressure
- Dirty environment

System design

- Measuring system: DT3005-S2-A-C1
- Connection cable: PC5/5

Advantages

- Compact sensor technology enables subsequent tool integration
- Robust sensors based on a reliable measuring principle
- Extended tool life
- Improved molding quality reduces rework time

