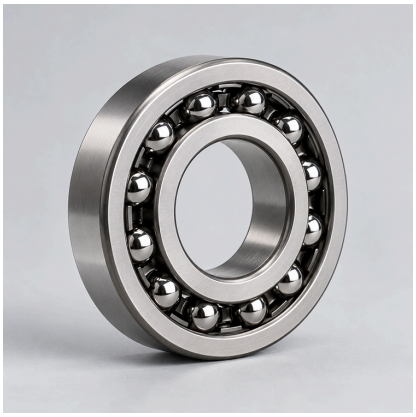
AUTOMATED MATERIAL MIX-UP DETECTION OF BEARING BALLS

Material mix-ups in bearing balls can compromise the reliability of the entire bearing. MAGNATEST detects deviations within milliseconds, enabling reliable 100% inspection.



THE CHALLENGE

Bearing balls ensure low-friction, reliable operation in machines, motors, gearboxes and other applications with rotating shafts. A single rolling element with incorrect material properties can impair the performance and service life of the entire bearing. Most balls are made of high-carbon chromium steel and pass through cutting, cold forging, grinding and heat treatment. Where several steel grades and process conditions coexist, material mix-ups or heat treatment deviations can occur. As these are not visible, every ball must be inspected for material grade and hardness within short cycle times and non-conforming parts separated automatically.

THE SOLUTION

Eddy current testing evaluates the material properties and heat treatment condition of bearing balls non-destructively. The method responds to changes in electrical conductivity and magnetic permeability, which correlate with differences in material composition and structure. For automated inspection, the balls pass individually through an encircling coil. The system detects each component and evaluates its electromagnetic properties within milliseconds, so deviations from the reference condition are identified during production. FOERSTER MAGNATEST TCL and MAGNATEST D transfer the test result directly to a PLC or sorting mechanism.





THE RESULT

The automated eddy current inspection enables 100% testing of bearing balls directly within the production process. Material mix-ups and deviations in the hardening condition can be detected within milliseconds without damaging the component. Automatic transfer of the test result to the production control system allows non-conforming bearing balls to be reliably sorted out before they are assembled into a bearing.This helps prevent incorrect rolling elements from entering subsequent production stages and supports consistent material quality and reliable bearing performance – even at high production speeds.

FOERSTER

MAGNATEST TCL

Magneto-inductive testing of components critical for safety



MAGNATEST D

Magneto-inductive testing of metallic components for material properties



MAGNATEST SENSORS

Sensors for magnetic induction testing of metallic materials in the automotive and aviation sectors and for semi-finished products



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