APPLICATION NOTE

APPLYING UCI ON NITRIDED SURFACES IN THE HEAT TREATMENT INDUSTRY USING SONODUR

Testing nitrided compound layers destructively disrupts production. SONODUR 3 enables direct, non-destructive UCI hardness testing on-site.

THE CHALLENGE

Nitriding enriches the surface of steel with nitrogen, creating a very hard compound layer (8–20 µm) and a diffusion zone beneath it (40–50 µm). The compound layer contains no metallic structure and differs significantly from the base material. Conventional hardness testing is typically destructive and laboratory-based, requiring removal of samples from production

THE SOLUTION

SONODUR 3 applies the UCI (Ultrasonic Contact Impedance) method, enabling hardness testing with minimal penetration depth at low test forces. After lightly grinding the surface to remove the compound layer, the diffusion zone can be measured directly. Adjustment of the Young's modulus ensures accurate results despite the modified microstructure.

THE RESULT

Hardness of nitrided components can be verified directly in the production environment without destructive testing. On-site measurement reduces downtime and eliminates laboratory delays. Immediate digital documentation ensures traceability and reliable process control in heat treatment applications.

SONODUR 3

Portable, high-quality and suitable for industrial use - the user-friendly SONODUR 3 sets standards in the field of mobile materials testing

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