DEUTROFLUX DEUTROMAT
Magnetic Particle Testing of Railway Components

KARL DEUTSCH

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For more than 50 years now the company KARL DEUTSCH is involved in development and production of equipment and systems for magnetic particle testing (MT). Our engineering department in combination with in-house PLC programming and control panel construction provide single source solutions and quick response to customer-specific demands. State of the art MT systems offer modular machine concepts with two AC circuits and usually operate with water-based magnetic particle fluids. Since 1993 our quality management system is certified by TÜV NORD CERT and was successfully re-certified in 2013 with respect to the most recent revision of the standard DIN EN ISO 9001:2008.

DEUTROFLUX UWS: MT of railway axles

Magnetic particle inspection plays an important role in the railway axle production as well as in the maintenance workshops of railway companies. Five workshops of the German railway company 'Deutsche Bahn AG' already rely on MT systems of KARL DEUTSCH. Right after overhauling and before re-assembly, the train axles have to be inspected for surface cracks. In some cases we delivered even DEUTROMAT test benches for railway axles of complete wheel set systems, with the wheels still mounted. In this case the wheels are tested separately with a special high-current coil.

Testing of railway axles for longitudinal defects (defects in axial direction) is executed by a current flow transmitted through the axle, generating an encircling magnetic field. Testing for transversal defects (defects in encircling direction) is done with coil magnetization, moving the motor driven coil (with the front side shower ring activated) along the part. The implemented bi-directional magnetization with alternative activation of the two shower rings reduces the cycle time – avoiding extra time for a non-test return run of the coil. Optionally this machine can be supplied with an automatic clamping length adjustment.

DEUTROFLUX UWS for testing of railway axles: For the inspection of the complete axle shaft a rotating support unit is used. Three UV large area lamps provide uniform illumination. The lamp mounts and the roof of the darkening cabin can be moved pneumatically to enable crane loading from top.

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Inspection of railway axle with mounted wheels

Other train components as well need to be inspected for cracks. Some of these applications can be handled by portable magnetic particle inspection equipment such as the DEUTROPULS Hand Yoke or the portable power pack DEUTROPULS Current Flow Unit. For testing of non-magnetic steel components, we provide our KD-Check Penetration Testing equipment (PT).

Our scope of products also comprises powerful chemical products for MT (FLUXA) and PT (KD-Check), both produced in-house at KARL DEUTSCH.

Typical railway components for surface crack detection

KD-Check penetration testing on railway wheels

Wheel testing with current flow unit and special high-current coil

Weld seam testing with DEUTROPULS Hand Yoke.

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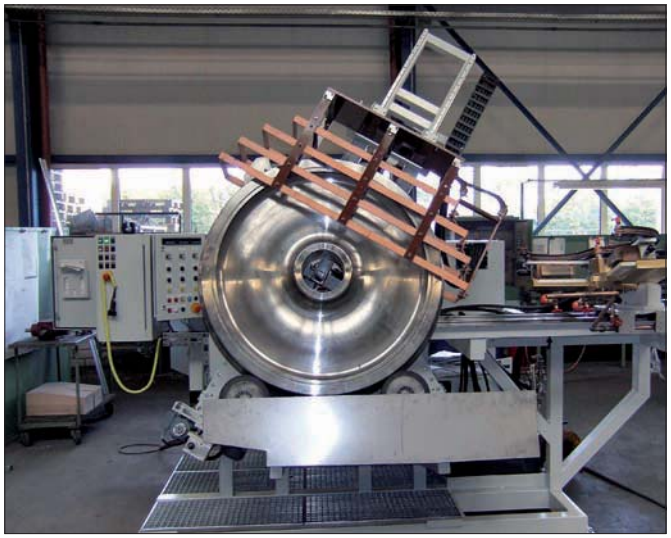
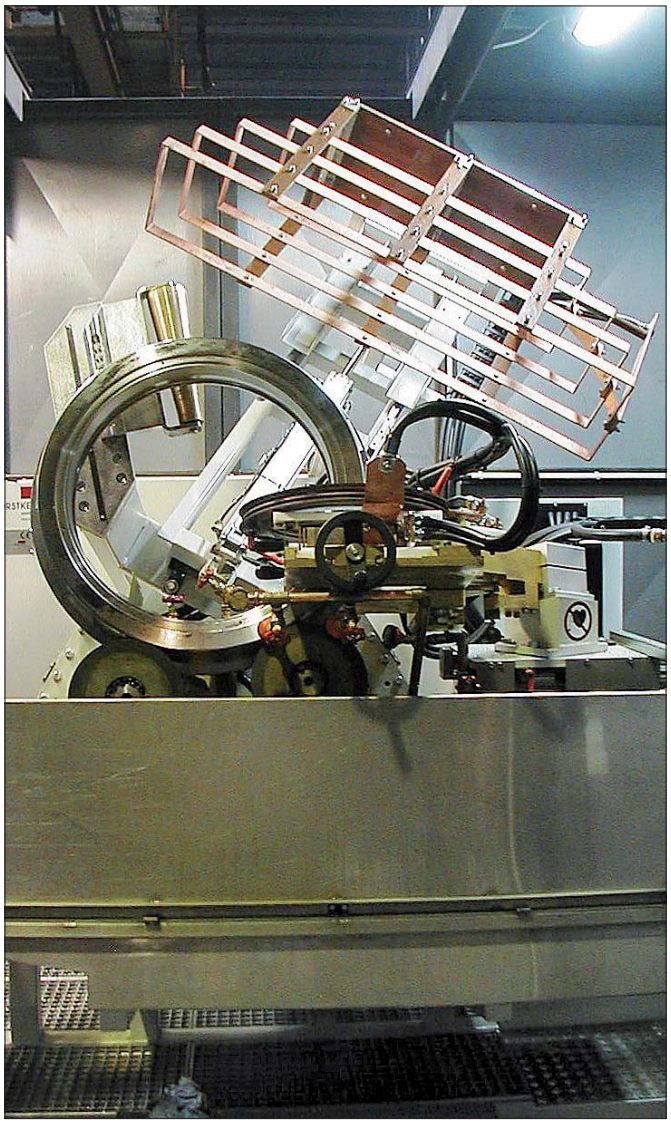
DEUTROMAT: Testing of railway wheels and steel tyres

A DEUTROMAT unit for magnetic powder inspection on forged wheels and steel tyres was installed at the German company BVV. A special high-current coil is used for magnetization of the wheels. The steel tyres are tested with a combination of high-current coil and yoke. In both cases the parts under test are rotated for 360° to cover the entire surface and to detect cracks of all directions. Loading and unloading is done from top by means of a crane.

Darkening cabin and crane for loading / unloading.



DEUTROMAT with railway wheel in test position



Testing of wheel tyres with hinged coil and yoke

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DIN EN ISO 9001 certified

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