

# Automated Testing Systems for Ultrasonic Testing of Railway Axles by ARXES-TOLINA

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## Abstract

The wheelsets of the railway rolling stock are periodically inspected by non-destructive testing to ensure the safety in the passenger and freight transportation. The ultrasonic testing of the wheelset axles is a standard procedure in the periodic maintenance. The arxes-tolina GmbH provides automated testing systems with optimised single-element transducers for testing of hollow axles and special phased array transducers for testing of solid axles. These systems are in use at DB and other railway companies worldwide.

Easy changeable probes for the different bore diameters are provided for hollow axles. The inner surface of the bores can be inspected by creeping waves. Optional a special analysis mode based on the SAFT-algorithm can be used to get more detailed images from not clearly evaluable indications especially from the press fit of the mounted wheels and brake disks. Often the natural indications caused by the pressing reach amplitudes near the acceptance level and it requires great experiences to differentiate them from real cracks at the surface of the axle. Hence the analysis mode can reduce the number of false calls and so reduce the effort, the costs and the time of non-operation caused by an unnecessarily dismounting of the complete wheelset.

Special features of the systems for solid axles are the coverage of a wide range of shaft diameters without changing the transducers, the testing at complex surface conditions such as saddle shaped and thick coated and the testing of driven axles with reduced coupling space on the shaft. The systems are easy operable, have a long service life, low service costs and a high availability.

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