

HEXAGON

Unmatched Measurement Expertise across Rail Applications



Across the rail industry, metrology is an increasingly used tool for ensuring production productivity and quality is improved and wastage is minimised without compromising passenger comfort and safety.

In manufacturing and maintenance, the integration of advanced inspection technology is a necessity. Each area of the railway production process has high potential for productivity gains by introducing improved inspection methods.

Hexagon has the ground-breaking metrology and automation expertise needed to understand and deliver solutions to various challenges.

Focus on Solutions for Railway Wheelset and Track Profile Measurement

Train wheelsets and rail infrastructure are typical wear parts and have significant effects on passenger comfort and safety as well as noise and ride. Profiles of wheels, brake discs, rails and switches are therefore regulated by recurring measurement operations in demanding operating conditions. The challenge lies in

the efficient generation of valid measurement data for the entire wheel-rail system. Efficient wheelset profile measurement can drive timely maintenance actions and help minimise train downtime, as well as ensuring a smooth and safe journey for rail passengers.

Hexagon's 2D laser profilers, automated on-track systems or portable measuring arms combined meet the specific demands of the railway industry by delivering accurate and reproducible results, independent of operator influence. These specialised rail profile measurement devices are widely used for wheel profile inspection, brake disc measurement, wheel distance measurement, wheel wear inspection and rail wear inspection.

Technologies and Products

2D Laser Profiler

Designed to measure all common train wheel, brake and track profiles, handheld rail measurement devices provide quick and correct evaluations with high repeatability.

The unique CALIPRI principle from Hexagon is a development of laser light section technology for non-contact dimension and profile measurements. It involves an innovative technology automatically correcting tilts and rotations of the measurement device. The result: highly accurate, reproducible, and user-independent measurement results – by hand and within seconds. Never again struggle with imprecisely positioned gauges: CALIPRI replaces error-prone and imprecise inspection devices.

The CALIPRI train and rail solutions range meets the demand of the railway industry for easy-to-use profile measuring devices with highly reproducible results. The

series stands for multifunctionality across the board for the complete wheel-rail system. Different software measurement modules for wheels, break discs, rails and switches allow customised use across the rolling stock domain. With CALIPRI rail measurement solutions, users can perform different measurement tasks with just one lightweight and easy-to-operate system. Measured dimensions are displayed on a tablet PC or directly via the sensor display, and can be compared to predefined limit values.

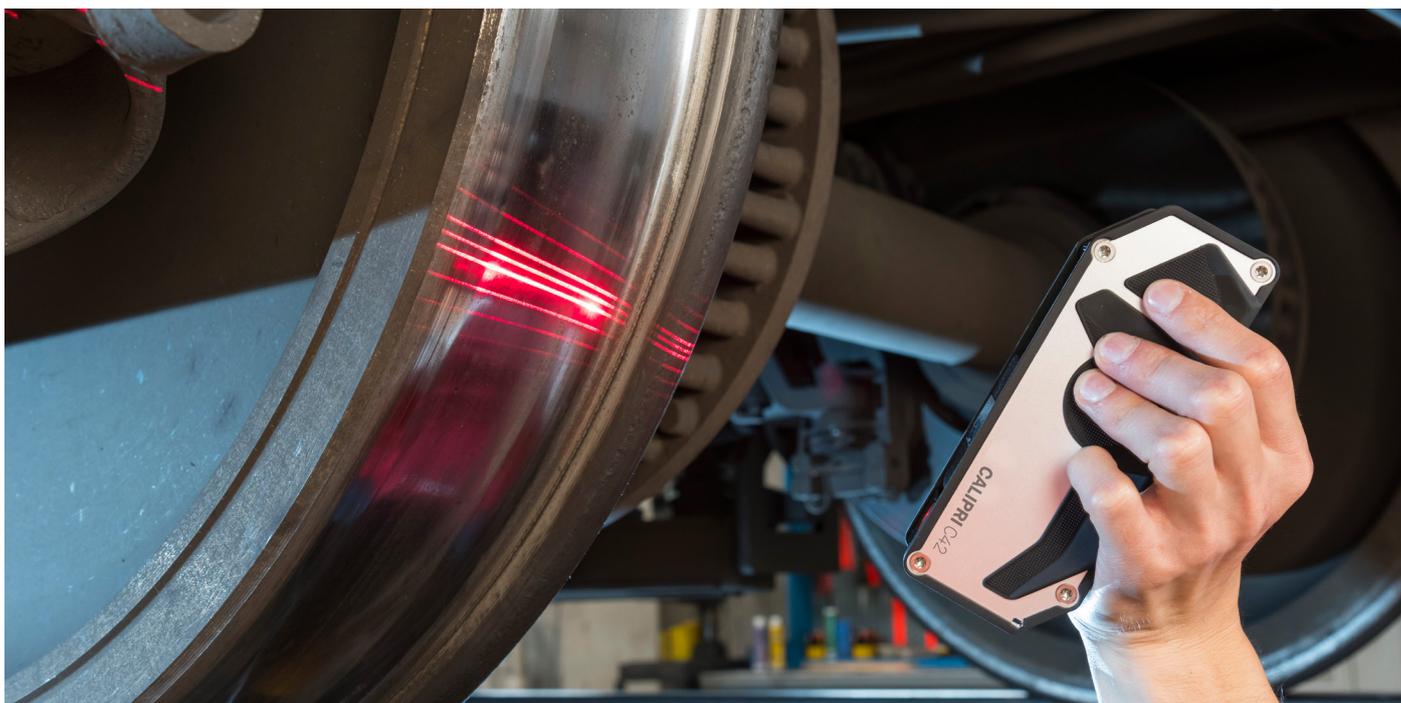
The CALIPRI C42 handheld measurement devices are widely used within the rail industry to support train wheel manufacturing and quality assurance. The CALIPRI technology is also applied to train and rail maintenance and service application including wheel profile wear and diameter measurement, brake disc wear analysis, rail and switch wear measurement and wheelset back-to-back distance measurements.

CALIPRI X is an automated, permanently installed on-track wheelset measurement system for the rail industry. It eliminates time-consuming and costly manual measurement, delivering precise results in seconds, immediately identifying out-of-tolerance areas.

An accurate understanding of wheel wear condition allows you to move from interval-based to condition-based maintenance – and ultimately true predictive maintenance – enabling better resource planning and significant cost savings. The non-contact optical laser system measures all wheelset parameters according to the European standard EN 15313 – including wheel profile, diameter, back-to-back distance, equivalent conicity, camber and wheel toe.

In combination with the cloud storage and analysis tool CALIPRI Predictor, measurements are automatically and





instantly stored in the cloud, saving the time and effort of your maintenance team. Together, CALIPRI X and the analytics of CALIPRI Predictor will enable you to safely operate your rolling stock with longer, more predictable maintenance intervals, less downtime and reduced lifecycle costs.

The solution ensures full traceability and allows secure 24/7 access to results and analytics for fleet technicians, workshop owners, maintenance workers and other company personnel, wherever they are located worldwide.

Measurement with CALIPRI X couldn't be easier: a train only needs to drive slowly over a sensor unit where laser and camera modules automatically measure and record the profile of the wheels. The system is easily installed on existing tracks where trains frequently run – in front of depots, workshops, washing facilities or in sidings. This allows frequent measurements to be made without extra effort or costs. The result is that you always know the current condition of your fleet.

Together, CALIPRI X and CALIPRI Predictor offer an integrated solution that delivers unrivalled productivity gains and operational cost savings when maintaining your rolling stock over its lifecycle.

The benefit for customers is that these measurement solutions close the loop between measurement, data handling and demand planning. With CALIPRI, the

entire process – from performing measurements and monitoring values to planning and executing maintenance – has been digitised as much as possible and predictive maintenance has been brought to life.

The Absolute Arm

The Absolute Arm delivers tactile probing and non-contact scanning in a uniquely ergonomic package to ensure accurate measurement that can be taken to the heart of production for inspection for expert analysis. It's the clear choice for high-end portable measurement applications. With usability central to its design, this is a measuring device that can't be beaten when it comes to ease of movement and ease of measurement. All this adds up to a far more productive and versatile arm that delivers high-accuracy measurement results more quickly and more easily than ever before.

A specialised touch measurement tool that also boasts the option for entry-level 3D scanning – the Absolute Arm 6-Axis is one of a kind. Based on patented technology with Absolute Encoders located at every articulation point and designed with ease-of-movement and usage as a focus, this is a portable measuring arm like no other.

The most recent developments in the current generation of Absolute Arm models make it the perfect answer to the challenging questions now being asked of metrology equipment. With IP54-rated protection



against liquids and particles during transport and measurement – a first on the market offering among portable measuring arms – the Absolute Arm can handle humid factory conditions, splashing oil and milling dust without breaking a sweat.

High temperatures are another area in which the Absolute Arm excels, with guaranteed operation at specified accuracies in environmental temperatures of up to 45°C. Whether it's down to production sites in the tropics or non-existent air conditioning systems, the Absolute Arm can stand the heat like no other portable arm on the market.

Integration within the Metrology Asset Manager solution offers another way in which the Absolute Arm is better protected than ever before. Thanks to real-time monitoring anywhere in the world, you can be protected against poor measurement results by making sure you know the moment arm performance drops below expected levels. Instant notifications can even be defined for incidents like shock events that may impact measurement accuracy and require a recalibration.

About Hexagon

Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications. Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter.

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