COMBINED PROFILE MEASUREMENT AND SURFACE INSPECTION

THE EAGLE'S EYE ON QUALITY

4D *EAGLE* S 50

4D *EAGLE* S 120

4D *EAGLE* S

THE STEEL INDUSTRY IS HEADING TOWARDS DIGITALIZATION

Rolling mills for the production of long products are increasingly equipped with measurement and automation technology. Continuous innovation enables ever more precise measurements at ever higher speeds and ever shorter reaction times. In this context, laser measuring systems are particularly suitable in rolling mills for digital profile measurement and surface inspection when rolling long products. They provide reliable process data and have thus become important elements in quality assurance in an era of the Industrial Internet of Things.

JOINED FORCES FOR INNOVATION

KOCKS and **LAP** look back on a long history as mutual market companions. Unique experiences put both companies in a position to bring a product to market that meets the high demands of modern rolling mills worldwide.

LAP has been leading in the field of laser measurement systems for the steel industry for decades. As a specialist in 3-roll techno-logy for the precise production of special bars, KOCKS contributes its in-depth expertise and has made its mark on developing measuring systems for the steel industry with its own solutions.

PIONEERS WITH A PRECISION MINDSET

The collaboration enables the teams of both firms to concentrate intensely on the topic of quality assurance by employing digital measurement technology. Additionally, both partners have access to the entire infrastructure of KOCKS and LAP, for example, for global sales and service.

THE PIONEER IN 3-ROLL TECHNOLOGY

The KOCKS Group, headquartered in Germany, is a global supplier of rolling mill equipment for the steel industry. Founded in 1946, KOCKS has developed into a globally recognized brand. With the KOCKS 3-roll technology, the company has built up a reputation as an innovator. Its core competencies include consulting, planning, development, design, delivery, assembly and commissioning of rolling mills, as well as the revamping and modernization of existing plants. In the course of the digital transformation, KOCKS is actively driving the change from product to solution provider and developing holistic automation and digitalization solutions.

… AND THE EXPERT IN LASER MEASUREMENT SYSTEMS

Since 1984, LAP has been the expert in non-contact laser measurement systems for rolling mills. During the rolling process, LAP's laser systems measure the contour of steel products, including wire, tube, bar, and profile. Integrating LAP systems in the rolling mill allows the measurement of correct dimensions during operation and provides recommendations for optimum adjustment of the rolling stands. This enables quality control and ensures production reliability. The user can react immediately to deviations and thus achieve time and material savings.

ELEVATE YOUR ROLLING MILL TO NEW HEIGHTS

Reach new quality heights with the precision of an eagle's eye. Experience the cutting-edge technology of the **4D** *EAGLE* S 50 and the **4D** *EAGLE* S 120. Raise your rolling mill to the next level in profile measurement and surface inspection.

TECHNICAL DATA	**4D** *EAGLE* S 50	**4D** *EAGLE* S 120
No. of sensors	4 AQUILIS sensors	4 AQUILIS sensors
Profiles	Round, hexagonal, square, flat	Round, hexagonal, square, flat
Measurement range	50 mm	120 mm (or 156 mm)
Typical product size	4 - 40 mm	10 – 100 mm (up to 146 mm)
Surface	Surface inspection and classification	Surface inspection and classification
Overall height / width / depth	1,580 / 1,470 / 460 mm	1,730 / 1,470 / 550 mm
Pass line height	520 mm	640 mm
Weight	~ 530 kg	~ 650 kg

FUTURE-READINESS WITHOUT COMPROMISE

Built with scalability in mind, the surface inspection and classification functionality is integrated as standard in every new **4D** *EAGLE* S to evolve alongside your production needs. You have the choice of utilising all functions to their full extent immediately or upgrade the hardware and software at a later date.

MEASUREMENT ACCURACY

High-speed measuring with precise and reliable results thanks to advanced temperature stabilization.

HYBRID TECHNOLOGY

Surface inspection and profile measurement combined in one advanced measuring gauge and a user-friendly and intuitive application software.

EASY MAINTENANCE

Extended service intervals and easy in-line maintenance, minimizing downtime.

STURDY DESIGN

Specifically designed for the demanding environment at rolling mills. Trust in the reliable and robust hardware components.

4D *EAGLE* S 50

4D *EAGLE* S 120

PRECISION MEETS PERFORMANCE

The **4D** *EAGLE* S combines classifying surface inspection with precise profile measurement in one powerful measuring gauge. The system accurately detects and classifies rolling defects using laser light sectioning technology. It also measures the complete profile of long products.

Installed in steel rolling mills, the measuring gauge jointly developed by KOCKS and LAP supports the path towards more efficient and transparent rolling processes. Advanced hardware technology and state-of-the-art software and machine learning open extensive analysis and evaluation possibilities – for sustainable process optimization and quality assurance.

SOPHISTICATED LASER LIGHT SECTIONING

The wide measuring field features four laser sensors. Blue and green lasers lines are projected onto the rolled material's surface. Special narrow-band filters ensure minimal sensor interference.

At the core of the **4D** *EAGLE* S are high-resolution cameras and advanced image processing, augmented by machine learning technology, enabling a significant technological leap forward. It allows the gauge to record detailed profile information. Thanks to the high measuring frequency, this data facilitates comprehensive surface inspection.

FAST

Unseen measurement frequency for small defects, highest resolution and a 3D view of bars.

PRECISE

AI-technology of machine learning detects single and periodic surface defects.

SMART

Comprehensive surface inspection and profile measurement paired with intelligent software.

SOFTWARE FOR CUTTING-EDGE MONITORING

The user-friendly and intuitive SMART CORE X software redefines the standards of profile measurement, defect inspection and process control, providing a significant competitive advantage. Explore the unique features and benefits of our human-machine interface that will help you reach your goals.

SMART CORE X encompasses all the necessary features to meet the most demanding requirements:

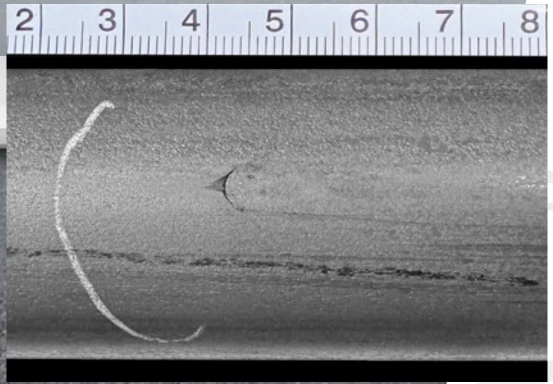
- digital profile measurement
- 3D view of defects
- comprehensive data insights
- open interfaces
- full customizability
- user-centric interface

The SMART CORE X interface:
Users in rolling mills benefit from high accuracy, filters, export capabilities, statistics and various customization features, providing exceptional experience.

DEFECT MAP

The defect map is the tool for visualizing surface defects in real time. It provides a clear, intuitive overview of the type and position of every detected defect across the rolled product. This enables operators to assess surface quality at a glance and make informed decisions immediately.

Scale in cm

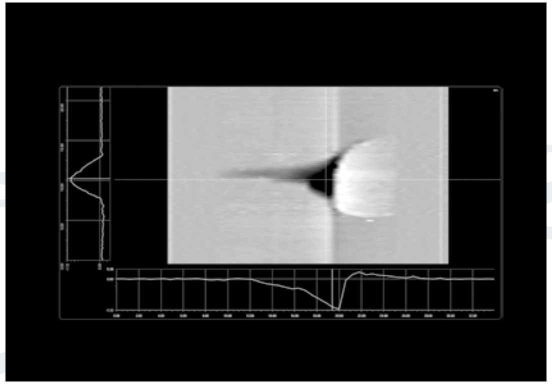


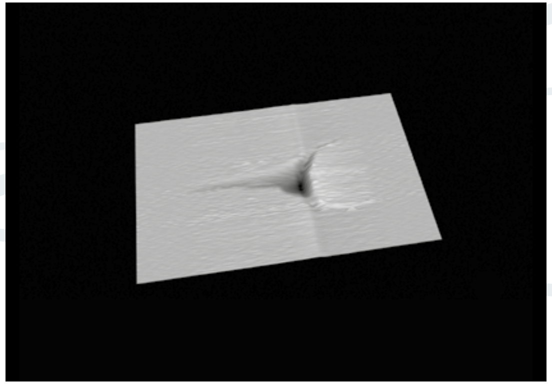
NOTHING ESCAPES THE EAGLE'S EYE

With the integration of high-resolution surface inspection, the **4D** *EAGLE* S takes quality assurance to the next level. Even the smallest surface defects are detected in real time – for reliable results and full transparency.

2D AND 3D VIEW OF DEFECTS

The 2D and 3D views transform raw inspection data into a detailed visual representation of each surface defect. This powerful feature allows operators to analyze the exact shape and depth of defects, improving classification and reducing false positives.





INTERESTED?

All information about the advanced
4D *EAGLE* S can be found at:
www.4d-eagle-s.com

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