

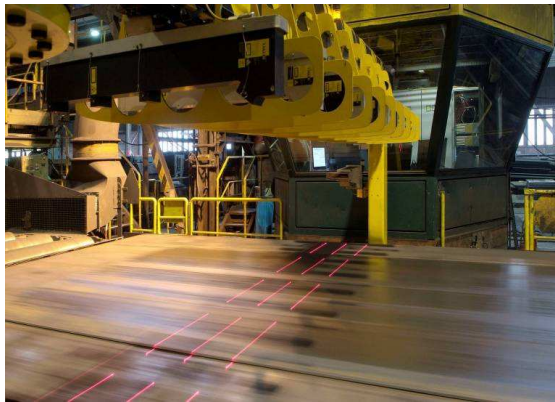
Inline flatness measurement system

Time, costs and quality are the main concerns in production facilities.

One of the procedures that affects all three matters is measuring plates during and after production.

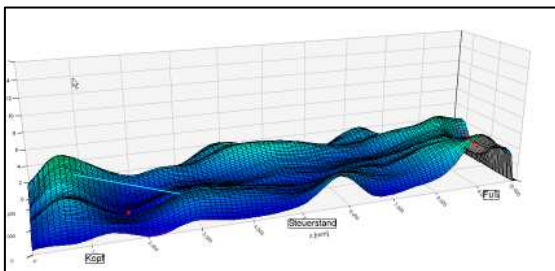
Compared to manual measurement of heavy plates, **automated inline flatness measurement** has considerable advantages, such as:

- 100% of the plates are measured
- Inline measurement
- Objective, traceable measurement
- Automatic classification of flatness defects
- 100% documentation (Automatic and complete)
- Automatic feedback to production process



(Pic.1 Inline flatness gauge at Thyssen Krupp Steel)

Nokra GmbH is specialized on development and production of laser measurement technology and provides tailor-made measurement systems for heavy plates, metal sheets and profiles. Until now nokra has set up over 150 systems with over 1000 sensors worldwide.



(Pic.2 Surface topography measured by arcus-flat)

Due to inline measurement (Pic.1), it is possible to measure 100% of the production output. The measurement device can be set up on any reasonable point in the line (e.g.: behind rolling, in front of or behind warm or cold flattening, end control). A topography of the plate is generated during measurement (Pic.2). Flatness defects are classified automatically.

Fast inline measurement (depending on conveyor speed) allows time saving, enhanced quality and a reduction of costs.

The system is equipped with double or triple laser line sensors and is capable of discrimination between plate motion and flatness deviations.



(Pic.3 Measurement gantry in alignment position)

For monitoring, maintenance and alignment the measuring gantry can be rotated by 90° (Pic.3) which also allows full conveyor accessibility e.g. for crane operations.

An adjustment station, equipped with a certified measurement standard granite stone block completes the system. It allows adjusting the lasers automatically within minutes as well as easy replacement of defective parts.

The measurement system is fully integrated into the production line and gives instant feedback to upstream and downstream units to optimize production and quality.

Robust systems components (Siemens, Rittal, Bosch Rexroth) and the tailor-made system design grant a long term stable measurement and operational availability of >98%, even in 3 shift usage.

The performed measurement is traceable, objective and automatically and completely documented in a database.

All requirements of measuring system capability according to MSA 2.0, repeatability, absolute accuracy and long term stability are fulfilled. Regular cleaning and lubrication is the only maintenance the system needs.

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