

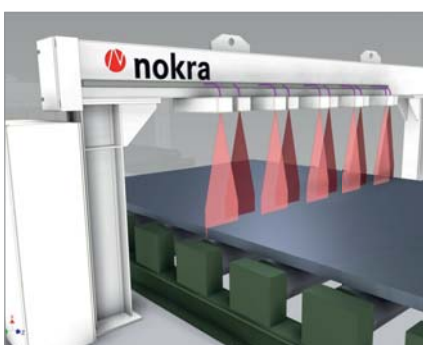
alpha.fi 2.0

inline flatness measurement



Time, expenses and quality are the key factors of any production line. In rolled steel production one of the effective control tools is measuring the flatness during different process steps. Comparing to the common manual measurement procedures, using an automated inline flatness gauge gives some important advantages, like

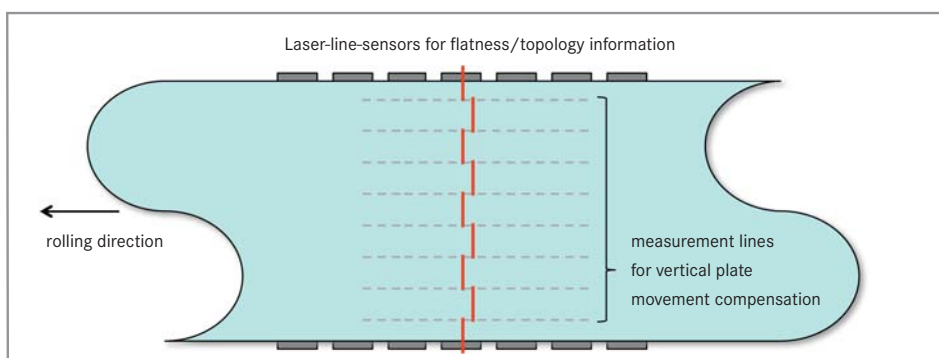
- 100% production coverage
- flatness measurement, evaluated according to: DIN/EN/ASTM or customer specific standards
- classification + display of standard flatness defects
- archive for reliable production documentation
- feedback to the production process, i.e. process control of leveller
- full flatness quality control



The usual procedure to quantify the flatness is a manual ruler measurement. The disadvantage of this measurement method is the restricted reproducibility, the high worker influence, the manual documentation and the huge work load.

In order to match this existing procedure, the nokra flatness measurement system calculates this ruler result automatically (acc. to DIN EN 10029 or EN 485-3 or ASTM A480 or any customer specific standard).

Fig 1: new alpha.fi 2.0 design



Highlights

- coils and plates of any length and width, hot or cold
- thickness up to 400 mm
- strip/plate temperature up to 1400 °C
- rolling speed up to 20 m/s
- integrated, software based compensation of vertical plate movement
- automatic adjustment and calibrating procedure
- low integration space (~ 1 m of strip width)

Options

- move cap for full accessibility of the production line (maintenance, crane operation)
- customer individual flatness evaluation
- true measuring tool capability according to MSA 2.0/EN 9001
- low maintenance requirements;
- low TCO

Since the result is available within seconds after the sheet/strip passes the gauge, the nokra equipment assures 100% coverage of the produced sheets/strip. On top of the ruler results the nokra flatness measurement system classifies typical flatness defect appearances.

The classification of these special flatness defect appearances gives important feedback to support the control of the levelling process. In total nokra provides a fully integrated, low maintenance inline flatness gauge to match the challenging environment demands even of the heavy steel plate production process.

- fully integrated, software based compensation of vertical strip/plate movement
- designed for rough environments, resistant against water, light, surface effects such as scale, ...
- automatic adjustment procedure guarantees a persisting measurement quality
- active temperature control unit to ensure independence to different temperature environments

Defect	Description	Presentation
Edge wave	Typical wavelengths from 150 mm to 2,000 mm	
Buckle	Symmetric curvature in both directions with a common area size around 500 mm x 500 mm	
Bathtub Turtle	Identically oriented curvature over around half of plate length	
Ski	Same orientation of the last few meters of the plate	

Fig 2: Typical flatness defects calculated by the nokra flatness gauge

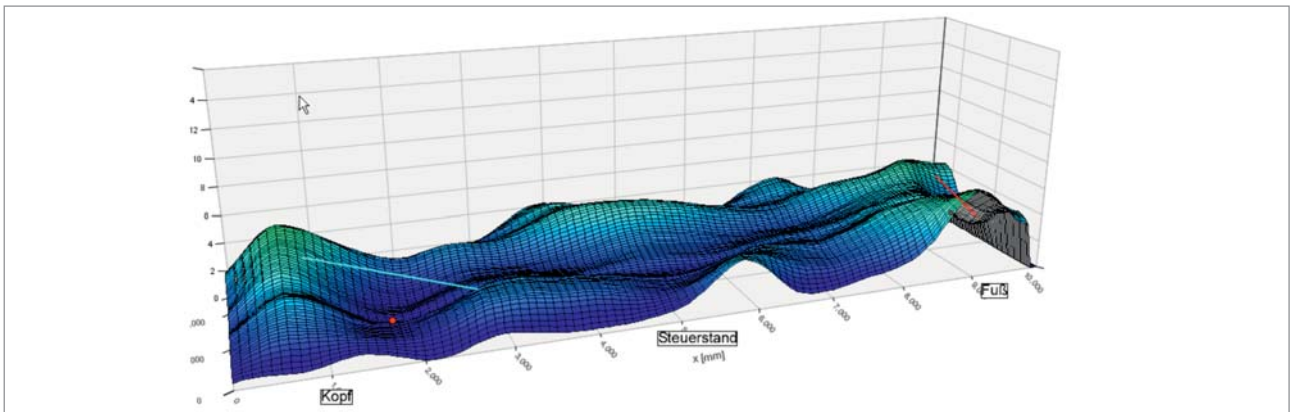


Fig 3: Display of a plate flatness topography including ruler results



Fig 4: nokra flatness measurement system alpha.fi at a plate mill

Your partner

nokra GmbH is an international medium-sized company, which provides high-quality measuring and inspection systems, such as flatness-, thickness or profile-measurement-systems for use in manufacturing. Our systems measure and inspect geometric features of coils, plates, strips, pipes, tubes or automotive parts such as length, width, roundness, thickness, profile, form and position. nokra itself develops laser sensors and automated inspection systems for these application fields. This enables every system to be customised to the specific

requirements of our clients and optimized for the respective application. nokra consequently has unique experience concerning measuring technology in the steel, aluminium and automotive industry as well as glass processing, plastics industry and plant engineering.

In addition to developing and manufacturing its own laser measuring systems nokra sells them worldwide. nokra has installed well over 200 systems with more than 2,000 laser sensors.