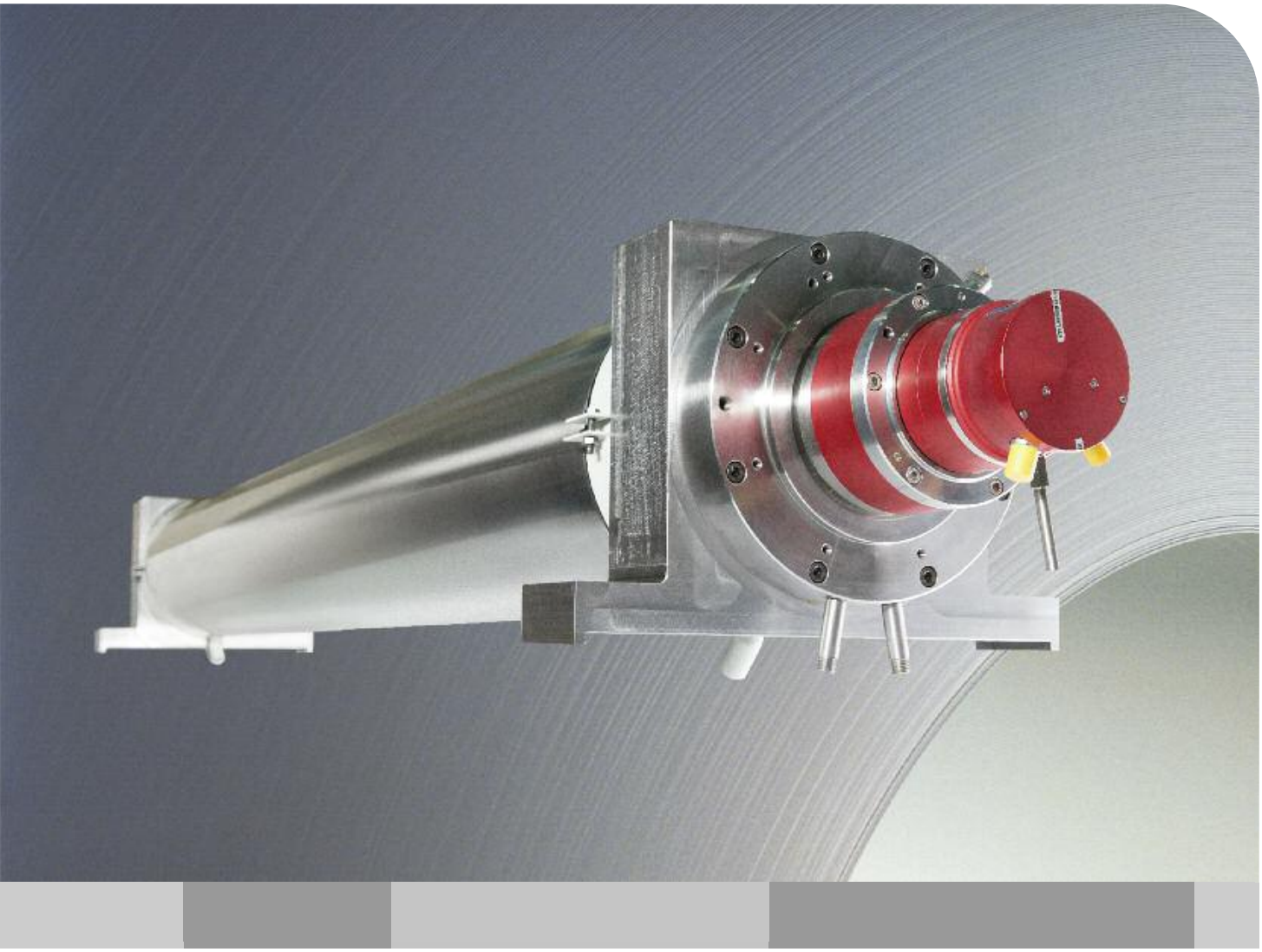
SMS group

X-Pact®

X-Shape – PRECISE FLATNESS MEASURING

Electrics and Automation



X-Shape

Flatness measuring system with rolls of the latest generation

SMS SIEMAG FLATNESS MEASURING ROLL

In addition to a constant strip thickness, the flatness of cold-rolled strip is the most important quality feature. Our technological control systems are designed to ensure strip flatness even under the most adverse conditions and at high rolling speeds of up to 2,000 m/min with close tolerances and across the entire strip width.

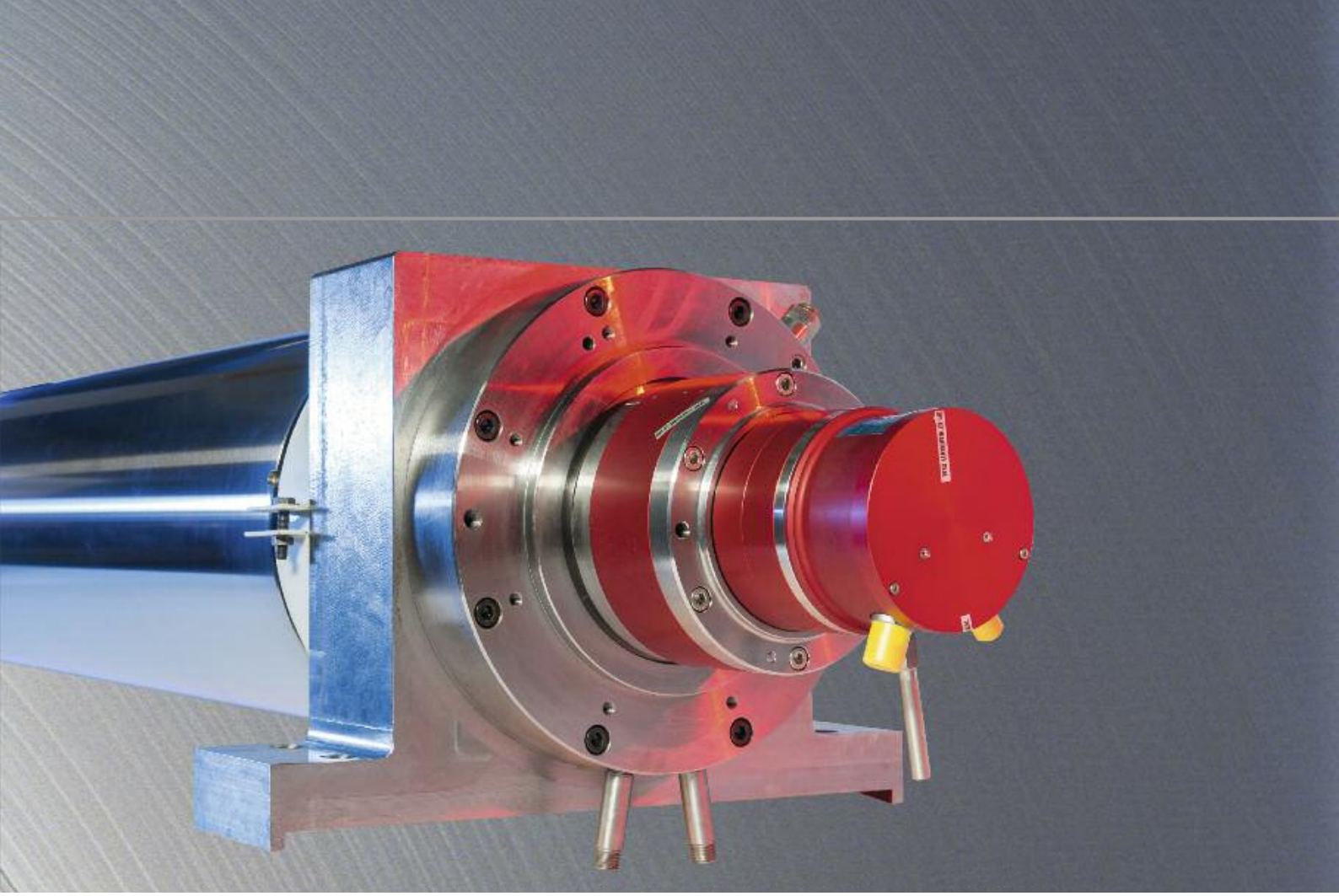
For this purpose, every closed-loop control system requires measuring systems which determine the actual condition and give an account of the deviations of the actual value from the desired target value of a process variable.

Because reliable and precise flatness measurement is of such great importance for our plants, a few years ago we at SMS Siemag decided to manufacture the flatness measuring rolls for our plants ourselves. These rolls carry the brand name X-Shape and are part of the X-Pact® product family, which represents innovative solutions in the field of electrical and automation systems from SMS Siemag.

MEASURING PRINCIPLE

The X-Shape roll technology is based on the measuring principle developed by the VDEh-Betriebsforschungsinstitut (BFI, Düsseldorf), which is implemented by introducing force sensors into a measuring roll body via axial bores and securing them in place. The position of the sensors and the width of the measuring zones can be freely selected depending on the minimum and maximum strip widths. The highly sensitive sensors detect even minimum variations in strip tension across the strip width by measuring the vertical force components of the strip tension. The strip tension distribution is the measure for the product flatness.

The axial bores have the advantage that the roll shells remain fully closed during manufacturing and therefore do not involve any risk of leaving marks on the strip surface. The roll surfaces can be standard-hardened or provided with various coatings, such as chrome or tungsten-carbide. In this way, the rolls' service life is extended, making them more wear-resistant.



ARRANGEMENT OF THE SENSORS

Up to 96 sensors can be fitted into the 4 axial bores. In this way, strip widths of up to 3,000 mm can be measured without gaps and in high definition in the area of the strip edges (26 mm zone width). This is of major importance as in modern rolling mills; especially in the field of aluminum rolling, the maximum strip widths continue to increase and thus in the edge zones can no longer be fully covered, in high resolution by conventional measuring rolls.

After the sensors have been positioned and fixed inside the bores by means of tapered sleeves especially developed by SMS Siemag, the signal transmitter is installed on the operator side, sealing the axial bores to be dust-proof.

Installation of the measuring sensor.

Measuring sensor with tapered sleeve.

Signal transmitter with cover.

SECURE SIGNAL TRANSMISSION

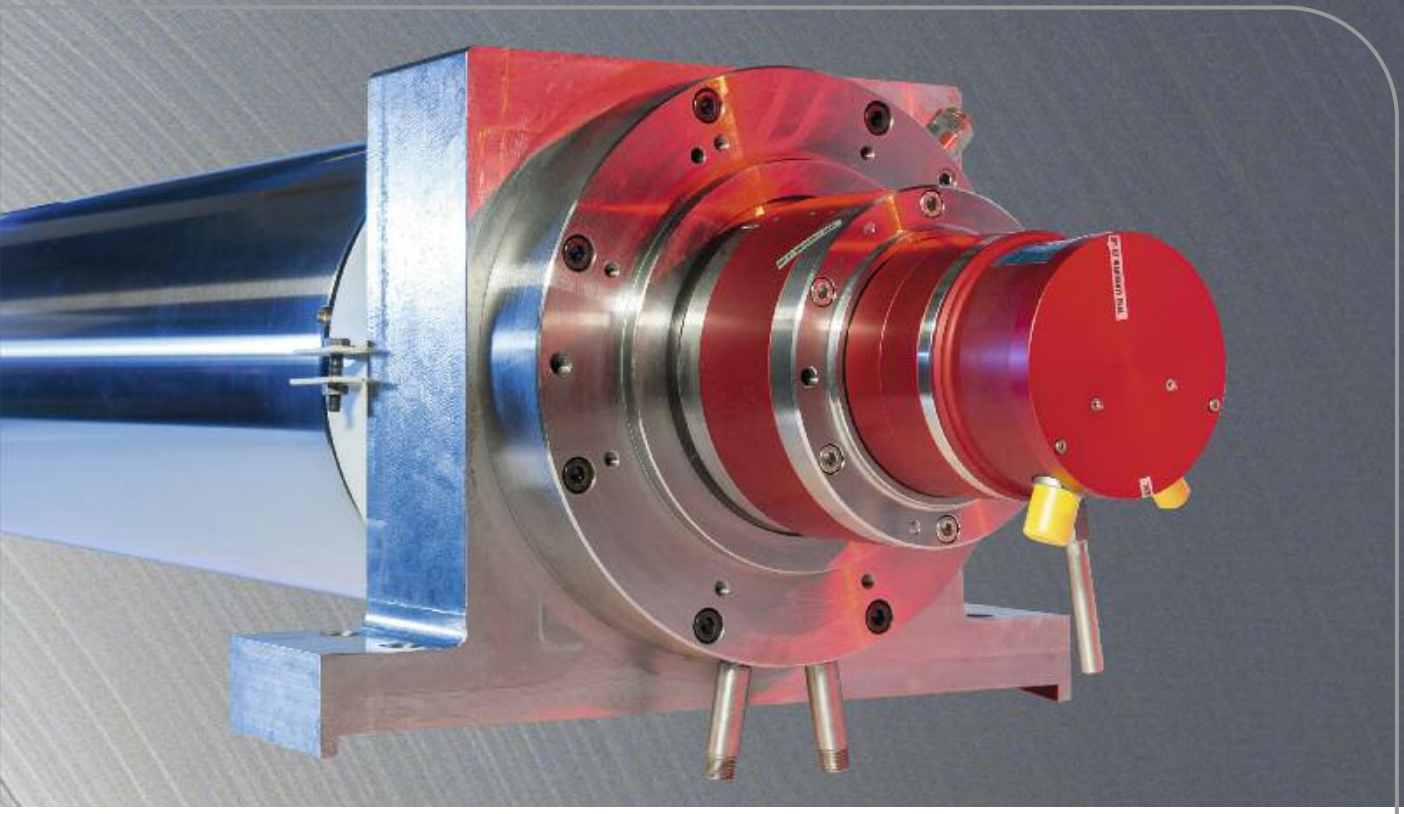
Digital signals are continuously transmitted maintenance-free via optical signal transmission. In the control cabinet included in the scope of supply, the signals are further processed. The raw signals from the sensors are evaluated with a newly developed software called X-Shape-Analyzer. The Analyzer precisely filters the useful part from the sensor signals and prepares it for the visualization and control systems.

The signals are then provided to the SMS Siemag flatness control system via a defined interface.

PERMANENT CALIBRATION

In our workshop, the measuring rolls are calibrated on the test stand developed by SMS Siemag. Calibration of the measuring roll on site upon installation in the plant or regularly during maintenance shutdowns, as it used to be common practice for measuring rolls in the past, is no longer required. This further emphasizes the system's maintenance-free design.

Installation of the signal transmitter.



OPERATING EXPERIENCE

Our experience gained in various rolling mills and strip processing lines for steel, aluminum and non-ferrous metals over the past years has continuously contributed to the further development of the X-Shape flatness measuring roll. In operation, the roll is characterized by its high reliability, low degree of wear and almost maintenance-free design as well as its high temperature resistance. The latter has proven to be essential especially for the rolling of strips at temperatures exceeding 200°C.

X-Shape can of course be installed in new plants or retrofitted in the scope of modernizations or revamps of existing plants.

Together with the X-Pact flatness control system, SMS Siemag offers a complete system perfectly tailored to match the process requirements. This technology sustainably ensures and even improves the productivity and product quality of rolling mills.

YOUR BENEFITS AT A GLANCE

- Mark-free measurement thanks to the closed shell
- Adaptation of the roll coating to the respective operating conditions
- Free configuration of the sensor arrangement and selection of the measuring zone width
- Possible measurement of up to 3,000 mm strip width with max. 96 sensors
- Reliable signal transmission and signal evaluation without mechanical wear
- Permanent installation without need for recalibration on the plant
- Installation in new plants and retrofitting to existing plants possible

SMS SIEMAG AG
Electrical and Automation Systems Division

Wiesenstrasse 30
57271 Hilchenbach, Germany

Phone: +49 2733 29-5895
Telefax: +49 2733 29-775895

Ivo-Beucker-Strasse 43
40237 Düsseldorf, Germany

Phone: +49 211 881-5895
Telefax: +49 211 881-775895

E-mail: Automation@sms-siemag.com
Internet: www.sms-siemag.com

MEETING your **EXPECTATIONS**

A/310E
500/09/13 · Ky · Printed in Germany