TORQUEMON
INLINE TORQUE MEASUREMENT FOR ROLLING MILL SPINDLES

Dynamic torque measurement supports the monitoring of drive systems in rolling plants. Problems arising during the production process in the drive train components are predominantly seen in the form of torque fluctuations. Torque observation supports the prevention of breakdowns, enables maintenance to be planned and increases production.

YOUR CHALLENGE

In order to ensure high product quality, stable and consistent rolling parameters must be achieved in the rolling process. Incorrect torque can lead to flatness defects on the product, such as turn up or turn down, which may cause additional damage or cobbles during the rolling process. Furthermore, in terms of reliability, fluctuating torque can lead to an overload, damaging bearings and motors and in the worst case resulting in breakage of the spindles, roll necks or chocks. In most cases this type of damage is related to the torque and a difference in speed between the work rolls.

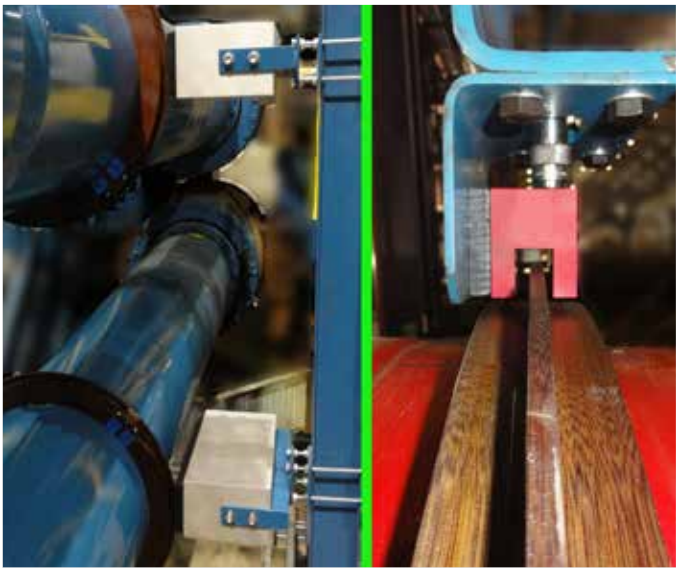
Speed measurements and current measurements at the motor are influenced by inertia and damping at the

gearbox so are not the most reliable method for determining actual torque loading. In comparison, measurements taken directly at the shaft can easily and reliably identify the true torque loading on the spindles.

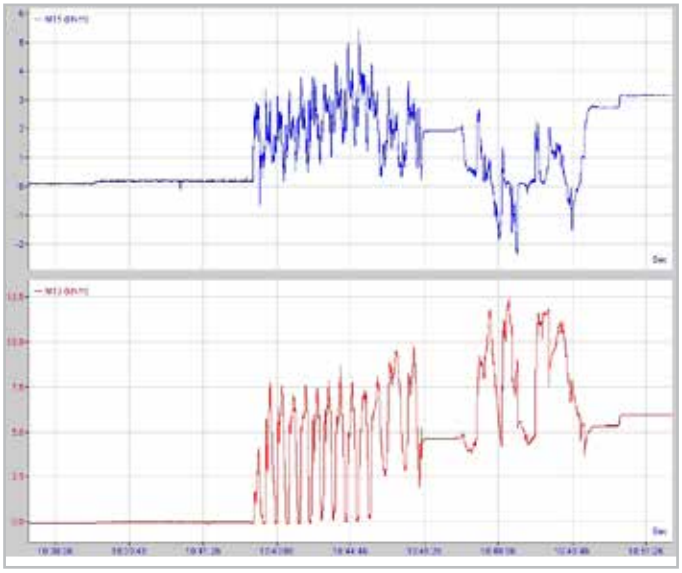
FUNCTION

The torque measurement system, TorqueMon, is a reliable method of measuring the torque of rolling mill spindles. It offers a permanent, real-time measurement based on the principle of strain gauge measurement. Sensors mounted on the rotating parts send the measurement signals to a rotary antenna.

A stationary, wireless, antenna supplies all rotary parts with power and receives the measurement signals from the spindle mounted sensor. Calibrated telemetry converts the measurements into analogue or digital signals. An optional evaluation unit can be used for data access and storage as well as for the evaluation of the data. These results can be easily used to verify and detect variations and overloads in the rolling torque during the whole rolling process.



Flat or fork type antenna



TorqueMon measurement data of upper and lower roll shaft

PRODUCT FEATURES

Torque measurement is possible under almost all environmental conditions. Sensor-positions can be calibrated remotely, and the measurement data transfer system can be used with other spindle mounted sensors, such as a temperature sensor.

The full range of amplification and offset settings are adjustable. The contactless transmission method uses inductive couplings between measurement and transmission devices. The design is maintenance-free and provides uninterrupted and permanent measurement (no batteries that can run out of power).

Features of Evaluation Unit:

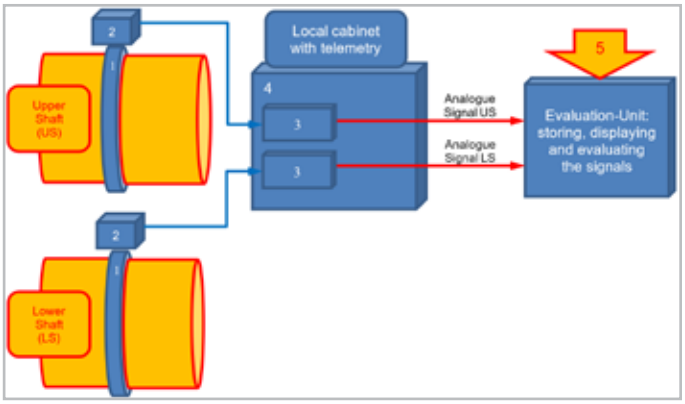
- Basic values: max/min/mean torque; load history, overload alarming
- Torsional spring oscillation analysis incl. dampening
- Torque stress related to design parameters over life-time (load collective, TAF...)

TECHNICAL DATA

- Rotational acceleration up to 100 g (optionally higher)
- Maximum shaft temperature of 100 °C (optionally up to 220 °C), max. surrounding temperature of 100 °C
- Measurement of dynamic torque up to 1 kHz
- Adjustable measuring and zero-point range
- Frequency range 0 to 1 kHz
- Temperature range -20 ° to +70 °C

ADVANTAGES OF TORQUEMON:

- Prevention of unplanned production stops
- Exact knowledge of health state of the shaft
- Industrially robust system
- High temperature stability (up to 100 °C)
- Maintenance-free, permanent measurement



TorqueMon with Evaluation Unit

ENHANCED PRODUCTIVITY

EASY MAINTENANCE

INDUSTRY 4.0

Primetals Technologies Austria GmbH
A joint venture of Mitsubishi Heavy Industries and partners

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