Rugged Sensors for Precise and Cost-Saving Roller Positioning

The Measurable Difference
**Tight Tolerances**

The demands on hot or cold rolled steel products are high. The thickness tolerances are subjected to strict, international standards, which must be met or even have to be exceeded in the field. At the same time the surface texture of the products have to be extremely homogeneous.

Hydraulic controlling systems adjust the rollers during the rolling process by horizontal and vertical displacement. During the roller positioning, high accuracy is essential. Temposonics® position sensors by MTS are reliable, precise and dynamic in this rugged environment. They are a cost-effective alternative to other measuring systems.

**Durable in a rugged Environment**

For direct stroke measurement MTS has developed position sensors which can be integrated into the hydraulic cylinder as well as mounted externally. The pressure-resistant sensor pipe is inserted into the open plunger. The pipe protects the sensing element containing the ferromagnetic waveguide that carries the measuring signal. A passive position magnet moves without contact and wear along the sensor pipe and marks the position through the wall of the pipe.

The robust design and the non-contact measuring principle reduce the time for maintenance and downtime. Despite hits during the rolling process, Temposonics® sensors are shock and vibration resistant and continue to perform well.

**Applications**

Rugged Temposonics® sensors measure the position

- of the working roller for hydraulic gap control
- to control the width of the strip
- for lateral support and alignment of the entering rolling stock
- of the pressure roller at the winder
- for the roller changeover.

*Rollstand with hydraulic gap control at a cold rolling mill*
Precise Roller Positioning

Temposonics® position sensors offer accurate measurement signals and minimize system related delays for a precise, dynamic control. This performance is decisive for accurate roller positioning and roller gap control. The standard resolution for position and velocity is 1 µm and 1 mm/s respectively.

For maximum accuracy the internal linearization increases the standard linearity. Due to a repeatability of < ± 0.001 % F.S. reference points can exactly be defined, stored and recalled by targeted positioning of the rollers on top of each other.

Sample Rates up to 10 kHz

Temposonics® R-Series SSI sensors provide high quality, synchronous position measurement suitable for displacement, velocity and acceleration control and enhance the quality of the finished roller product.

To fulfill high, dynamic requirements, the sampling time for the measuring value is shortened so the controller can read the position values out with an update frequency up to 10 kHz - independent of the measuring length.

Cost-saving Alternative

Magnetostrictive Temposonics® position sensors by MTS increasingly replace the widely-used incremental measuring systems. Major OEMs engaged in the rolling mill process already accept them as an attractive alternative. In direct comparison, both transducers show the same accuracy. But the sensors by MTS are the more cost-efficient solution due to a cheaper initial investment and their longer life cycle.

Temposonics® sensors are easy to install. All parameters are preset according to the order specifications, thereby avoiding a time-consuming on-site calibration. The sensor head contains the whole electronics. When maintaining the machine the electronics head and the sensing element can be dismantled or installed quickly and separately from the sensor rod just by loosening two screws.

Comparison of position signals at a resolution of 1 µm
Dear Business Partner,

with the MTS magnetostrictive position sensors you can reduce your costs significantly. They are a well-priced investment and operate without any wear for years. Decreasing magnetisation and limited durability are worries of the past. Temposonics® sensors offer a considerably longer service life than other measuring systems due to their stability and no wear operation.

At the same time they are so precise, that the strip thickness can be adjusted to few micrometer. Their accuracy can definitely be compared to an incremental measurement system. Numerous equipped applications in rolling mills and extensive test runs confirm their performance.

Decide today for a position measurement with unbeatable price-performance ratio. Choose Temposonics® sensors!

With kind regards from Lüdenscheid

Yours Joachim Hellwig
(Vice President MTS Sensors)