

## Strip speed registration in the recoiling line of hot wide strips

*The hot rolled wide strip is used as raw material for cold rolling applications, tinplates and silicon steel sheets, or as direct applications in the construction of machines, boats or wagons. Good quality work needs trimming and straight coils with a stepless line speed. Precise, non-contact measurement of the speed is vital to control the plant.*



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Hot rolled strip in the coiling box at TKS Bochum

Thyssen Krupp Stahl AG belongs to the main world-wide manufacturers of high-quality hot strips. The hot strips make up 90% of the total rolled steel volume manufactured by Thyssen Krupp Stahl. The steel grades range from soft deep

drawing grades for the automobile industry, to high strength structural steels with a minimal resistance of 1200 N/mm<sup>2</sup>, to plain carbon steel with around 1.0%C. Alloyed and unalloyed steel will be treated into heat-treatable steel, spring steel and tool

steel. Household appliances and enamel commodities, belong to this category too.

### Hot rolled wide strip

Usually, the hot rolled strip is delivered rolled with a thin layer of scale. However, depending on the customer's demand, follow-up treatments like pickling, skin pass rolling, splitting or rounding are needed. In the hot rolled wide strip lines of Thyssen Krupp Stahl AG in Bochum, the rolling strips can be coiled at the speed of 17 m/s in the underfloor winder. With the high driving power and coil box, the function of the Bochum hot wide strip line is to roll high quantities of steel, but also to produce it with a stainless quality.

addition, a tolerance deviation of thickness and width appear with some strips during the rolling process in the rolling mill. Such hot rolled strip coils have to be scrapped and reprocessed to a new customer's demand. With cutting, separating, trimming and recoiling at the new coiling line, in service since December 1999.

The plant is designed to produce widths from 550 to 1640 mm and a thickness from 1.25 to 6.35 mm. ▶



Non-contact speed measurement with the VLM 200

It can happen that some of these strips come misaligned due to the coiling process. In



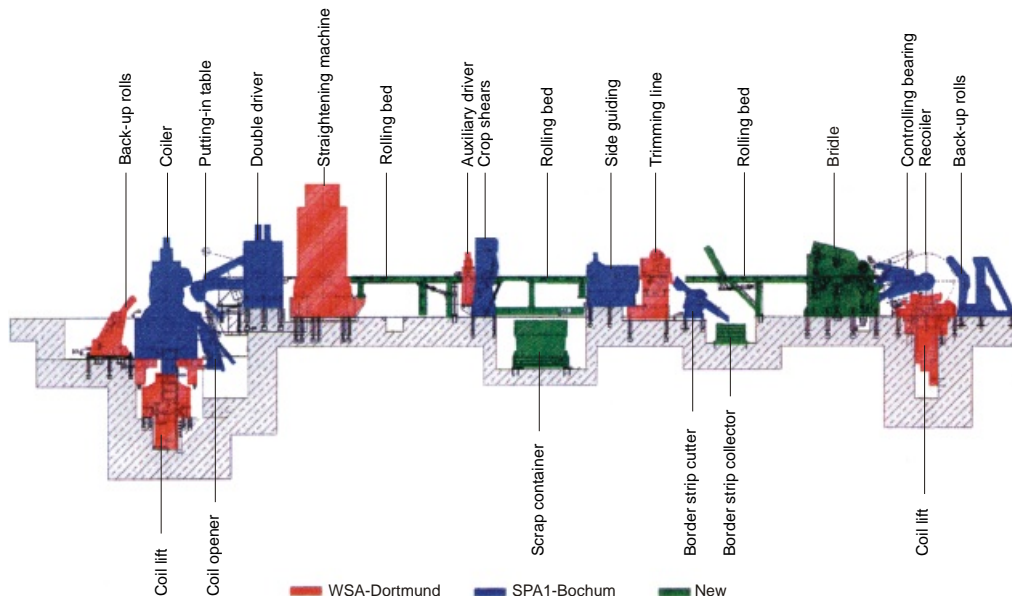
The contact-free speed measuring system VLM 200

## Non-contact measurement of strip speed

The goal was to measure the speed of wide strips with different flatness and to deliver automatic speed signal to the process control system. In the past mechanical sensors (encoders) were not reliable enough to the production process. Maintenance issues such as downtime, replacement costs, and production losstime were causes of investing in a non-contact measurement system. Therefore, a VLM 200 D system developed by ASTECH GmbH was installed.

The VLM 200 was mounted in the middle of the strip, in front of the coiler. The gauge works as the speed master, and gives the real strip speed needed for the control of the drives and for the Coil Diameter Control.

The gauge can tolerate, due to its distance from the steel, the variance of the strip so as different strip thickness. Differences in standoff up to 60 mm are without any



Layout of the recoiling line for the hot wide strip line

influence on the measurement, which is guaranteed in the specification.

### High reliability

The non-contact working principle meets the rough conditions of the hot strip

processing. The technique is easy to handle and is appreciated by the operators because of the high reliability and operating safety. By using the VLM 200, the plant is controlled by modern regulations and coiling process can be achieved with

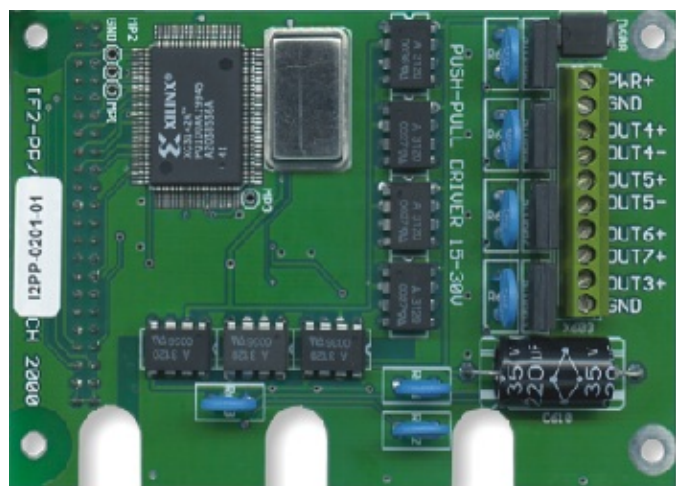
the demanded quality. An increase of production speed enables a noticeable rise in production volume. This is particularly noticed during the straight coiling at high strip tensions and at a stepless line speed. ■

## A new pulse output for the VLM 200: IF2/PP

A new pulse output for the VLM 200 is now available. The optional plug in card IF2/PP supplies two high-resolution pulse outputs, each with 2 phases and frequency range

from 0,1 Hz to 50 kHz. The first pulse output has furthermore the inverse signals /A and /B. The resolution is 20ns. The seven outputs "OUT3" to "OUT7" are optically isolated.

OUT3 is another status output. The outputs are designed like push pull outputs. The maximum current is 100mA per channel. The maximal length of the cable is 200 m. The card needs an external supply voltage from 15 to 30V. ■



IF2/PP-board with push pull pulse output