

Grain Size & Remanence Measuring System for Cold Rolling Mills

”On-line annealing control improves efficiency of continuous annealing lines”



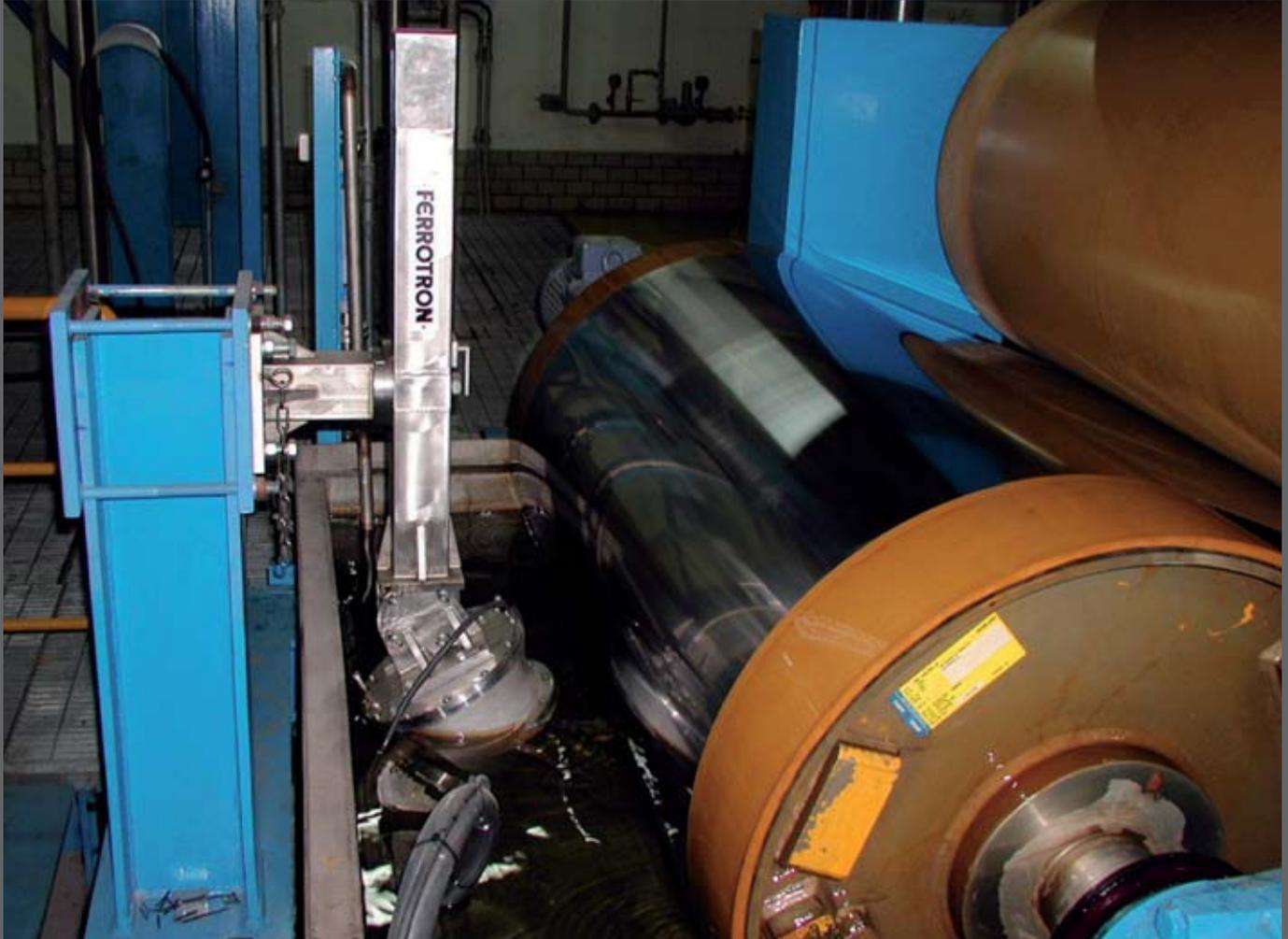
The FWT 25 and the FWT 100 are powerful tools, with the following positive impacts:

- Improved Quality Assurance
- Enhanced Reliability of Production
- Energy Savings
- Reduction of Sampling Costs
- Increased Annealing Line Troughput



FWT 25 – Grain size measurement by ultrasound

The instrument FWT 25 is used for the continuous and non-destructive measuring of the grain size of **austenitic** stainless steel strip



Measuring Principle

Ultrasound signals are reflected by metallic material. Under a certain angle a maximum signal is detected (about 31° for stainless steel). The received signal includes information of the grain size which can be compared with a calibration curve. Thus the values of

the grain size can be calculated. In case of the used ultrasound frequency of 25 MHz the measuring range is about 8 to 40 μm . Typical accuracy is +/- 2 μm .



Robust Design

- Assembled completely on customers premises
- No significant modification at the annealing line
- Mechanical setup adaptable to on-site requirements
- Measuring system protected against damage
- Low maintenance expenses

FWT 100 – Remanence measurement in a continuous annealing line

The instrument FWT 100 is used for the continuous and non-destructive determination of mechanical properties of **ferritic** stainless steel strip



Measuring Principle

After being cold-rolled, steel strip is annealed to achieve recrystallisation. In case of ferritic stainless steel there is a clear correlation between grain structure, mechanical properties and magnetic behaviour. During the annealing process the values of the apparent remanence drop significantly, reaching a minimum

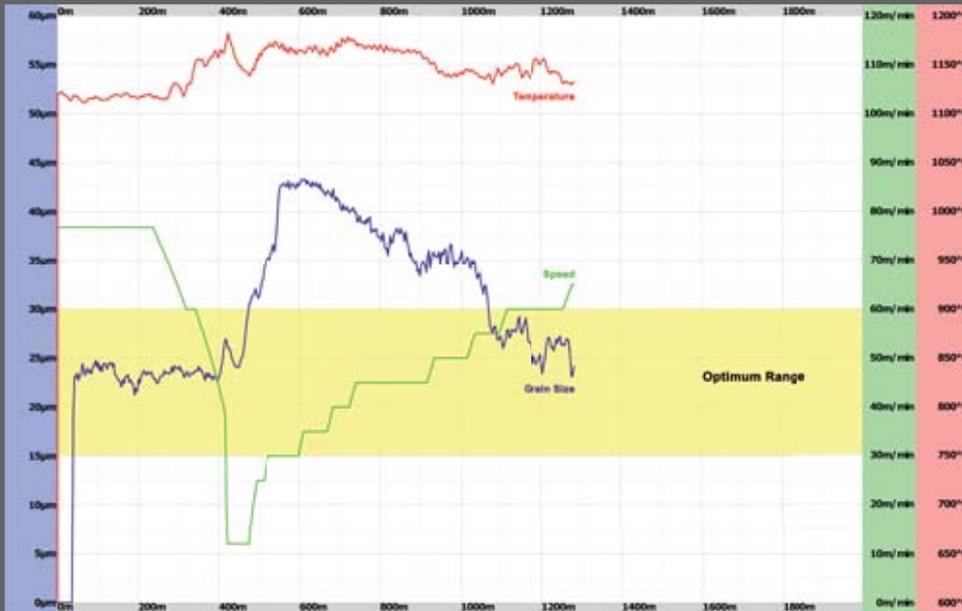
value in case of full recrystallisation. Overannealing can be observed by increasing values because of the formation of Martensite. The measuring system consists of a magnetizing roller and a field detecting roller which are mounted over a strip guiding roll.

Part of our reference list:

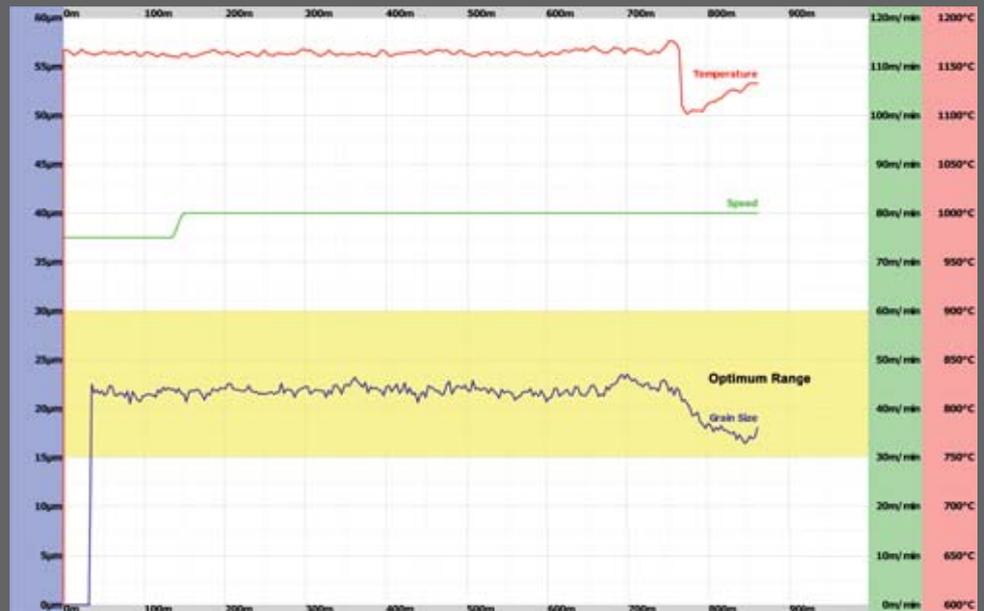
- INOXUM, Germany
- APERAM, France and Belgium
- Acerinox, Spain
- Outokumpu, Finland
- North American Stainless, USA
- AST, Italy
- Columbus Stainless, South Africa
- Mexinox, Mexico
- Bahru Stainless, Malaysia
- SKS Shanghai, China
- Thainox, Thailand
- Marcegaglia, Italy

On-line grain size recording

Influence of change of speed and temperature on the grain size value



Example for bad annealing



Example for good annealing

For comprehensive information about **FWT 25** and **FWT 100** – the measuring systems for cold rolling mills, please contact us.



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