



# PROPERTYMON

## INLINE MEASUREMENT OF STEEL STRIP PROPERTIES

With increasing quality requirements, higher productivity, increased competition and cost pressure, process measurement and control is more important than ever. Good process control is essential to stable and consistent production, particularly for higher strength grades that are more process critical. End users also require greater levels of quality documentation and certification.

### YOUR CHALLENGE

Tensile testing only provides values at the sample position, so it is not possible to get a quality assessment for full strip length. Tensile tests are also slow and provide no immediate feedback to the process. Conventionally more comprehensive monitoring has been achieved by recording process parameters and modelling simulation. Measurements directly related to the microstructure are preferable. The challenge is taking direct measurements without destructive testing.

### OUR SOLUTION

PropertyMon provides in-line detection of mechanical or magnetic properties in the steel strip using an electromagnetic principle. The system performs a continuous, in-line and contactless inspection along the strip length. The results are immediately available, visualized for the benefit of the operator and stored in PropertyMons' internal database. Non-contact sensor heads inspect the entire strip at full plant speed. The sensors can be automatically moved to measure at different positions. Both longitudinal and transverse measurements are possible. The compact sensor geometry means that the measurement is independent of strip speed. All hot- and cold-rolled ferromagnetic steel grades including micro-alloyed, IF, dual-phase, silicon and TRIP steel grades can be measured.

LONGITUDINAL  
& TRANSVERSE  
MEASUREMENT

## FUNCTION

The PropertyMon system measures electromagnetic values (hysteresis curve) of ferromagnetic materials and exploits the interrelationship between mechanical, material and magnetic properties. Output values with an accuracy in the same range as laboratory destructive tests are calculated by applying multiple linear regression. The calibration is obtained from PropertyMon measurements and corresponding laboratory samples, the use of online process parameters from the plant is not necessary but can be used to enhance the results.

The system is directly connected to the Level 1/2 automation system of the processing line so that all relevant information, such as strip identification, grade, thickness, strip position, etc., can be obtained and the results sent back and stored in the PropertyMon database with synchronization to the measurement position.

## MAIN FEATURES

- Simultaneous detection of mechanical and magnetic properties
- Reliable differentiation between different steel grades
- Directional measurements for anisotropic properties
- Compact industrial sensor heads provide localized measurements independently of strip speed
- Tracking of sensor stand-off height from strip to ensure accuracy of results
- Sensor traversing function for measurement at different transverse positions
- Automatic or manual operation and control from local cabinet, remote access from operator pulpit also possible
- 4-Step safety features to avoid strip contact and ensure operational safety

## PLANT DATA

Strip thickness	0.25 to 5.0 mm
Strip speed	0 - 800 m/min
Measurement	Up to 1600 MPa
Max. Strip temperature	100 °C



PropertyMon sensors

## SUMMARY

The PropertyMon in-line system provides non-destructive assessment of the product properties along the entire length of the strip. Calibration with conventional destructive test data, provides comprehensive and reliable quality assurance along the full strip length. This enables the consistency and stability of production to be monitored and any deviation in process and properties to be quickly identified so that remedial action can be taken.

## MAIN BENEFITS

- Advanced inline measurement
- Detection of mechanical and magnetic properties
- Material properties evaluation and documentation over whole strip length
- Reduction of customer claims
- Process optimization with respect to quality, capacity, output, energy
- Reduction in number of destructive laboratory tests
- No special plant parameters required



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Order No. T08-4-N196-L2-P-V4-EN  
Printed in Linz | © 2022

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