

NLMK Group, Belgium: medium and heavy steel plates

NO CAPEX
Short ROI period

Benefits

Start-up: leveler set-up time drastically shortened.

In use: improvements for both product quality and process efficiency.

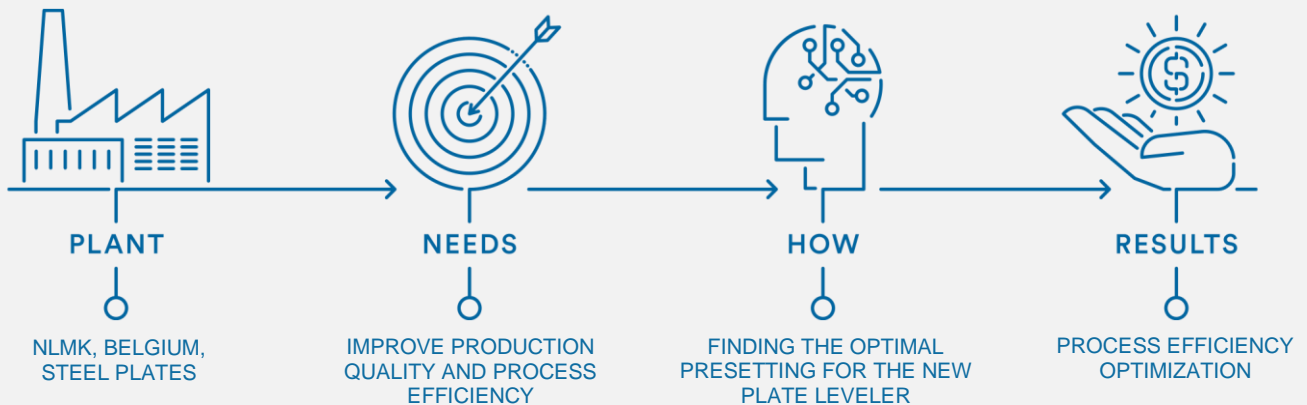
No CAPEX → short ROI period!

Quick changes to monitoring rules for potential product changes or modifications in process parameters.

Various improvements brought CIM (Computer Integrated Manufacturing) levels from 0 to 3 thanks to data collection inspection.

General knowledge gained on this steel plates rolling process.





Context

NLMK Group, Belgium, is specialized in medium and heavy steel plates.

They produce a wide range of plate products for various industrial applications:

- ◆ thickness from 3 mm to 120 mm;
- ◆ variety of carbon steel grades;
- ◆ weak alloys and alloys.

NLMK has an annual production capacity of 750,000 tons. The process comprises a rough-hewing quarto mill, a 4-stand finishing mill, an accelerated cooling installation and a new steel plate leveler.

Scope

NLMK wanted to improve production quality and process efficiency thanks to optimal pre-setting of the new plate leveler:

- ◆ Identify preliminary setting instructions of the clamping force to apply on steel plates.
- ◆ Force values are closely linked to elastic limit values of rolled plates.
- ◆ Large historical database available from laboratory elastic limit tests and process measurements.

Objective

Build a “soft-sensor” model to optimally predict the pre-setting instructions of the plate leveler making use of knowledge extraction methods on available historical quality and process data.

Solution

DATamaestro, PEPITe's data analytics software, was used to achieve the main objective of a "soft-sensor" model.

Off-line data analysis carried out to:

- ◆ prepare and inspect the historical data;
- ◆ build clusters of steel plates with similar chemical and mechanical features;
- ◆ learn and validate predictive models for the elastic limit for each cluster.

Validated models were embedded into the industrial IT environment to allow online monitoring of the new steel plate leveler.

