

TITLE: EXPERIMENTAL STUDY & SIMULATIONS OF THE TRANSFORMATION BEHAVIOR OF HIGH STRENGTH STEEL GRADES

KEY WORDS OF ASSIGNMENT:

- Advanced high strength steels
- Transformation behaviors: experimental work, models & industrial trials
- Contributing to the solution of real industrial problems
- Contact with a large variety of environments: from fundamental knowledge at university to input for actual production lines & industrial trials

SUMMER APPRENTICESHIP

MASTER THESIS

WORK/SCHOOL APPRENTICESHIP

PROJECT

CONTENT OF ASSIGNMENT (POSSIBLY ILLUSTRATED WITH PICTURES/DRAWINGS):

New developments in the steel industry require the use of high strength steels which are heavily alloyed. During the production of these grades on the hot strip mill, several industrial problems are encountered as control of the cooling at the run-out table due to unforeseen phase transformations; loose inner windings; and egg-shaped coils due to incomplete transformations. Fundamental knowledge is lacking to solve these issues. Therefore, experimental work (annealing simulation tests with & without deformation combined with microstructural characterization) & fundamental understanding of the metallurgical processes occurring during industrial production are needed. Based on this knowledge, our industrial models can be fine-tuned and solutions could be provided. The latter will be tested in a real industrial environment.

OBJECTIVES:

- Perform annealing simulation tests with & without deformation
- Metallographic evaluation & phase distribution determination
- Test with simulations of industrial models & real industrial trials to control the cooling on the run-out-table
- Link with industrial problems related to loose inner windings & egg-shaped coils

EXPECTED COMPETENCES (KEY WORDS):

- ✓ Design of experiments
- ✓ Fundamental understanding of metallurgy
- ✓ Simulations of industrial processes
- ✓ Translating obtained results into actual industrial relevant information & communication of obtained results to people with different backgrounds

NUMBER OF STUDENTS:

- 1

TARGET GROUP: BACHELOR/MASTER/ ... & SPECIALIZATION(S):

- Master in Civil Engineering Materials Science: Metallurgy

LOCATION:

- ArcelorMittal Gent + Ghent University (Zwijnaarde)

PROMOTORS:

- Industrial : Dorien De Knijf (Quality department), Sam Werquin (Systems & Models)
- Academic : Roumen Petrov (Ghent University)



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