# PhD in Management, Production and Design

## Research Title:
**Technological innovation in the field of hot rolling of long steel products, referring in particular to metallurgical and thermo-mechanical aspects**

### Funded by
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### Context of the research activity
Most research activities will be performed in the Lesegno steelwork, which includes a rolling mill for long products, and especially in the adjacent research laboratory, whose equipment includes a thermo-mechanical physical simulator (type Gleeble 3800), able to reproduce hot rolling temperature and deformation cycles on small specimens.

### Objectives
The goal of the PhD work will be to study the metallurgical evolution of different steel grades during the whole hot rolling cycle, from reheating to final cooling.  
In fact, the final mechanical properties of the steel products depend on the austenite evolution during hot rolling, and are influenced by the rolling and cooling parameters.  
In particular, the recrystallization phenomena that occur in every rolling step, as a function of the rolling temperature, speed and deformation, determine the austenite properties (such as the grain size and dislocation density), and these properties and the final cooling speed determine the eventual steel microstructure and mechanical performance.  
Therefore, better knowledge and modeling of the above phenomena will allow the design and application of new or improved rolling procedures, aiming both to achieve energy and cost savings, and to fabricate improved rolled products with high added value.
| Skills and competencies for the development of the activity | Ability to work in different environments, both in the lab and in the plant, flexibility, high analysis and problem solving skills, team working attitude, as well as ability to work independently. |