

# Course

## Hot Rolling of Long Products

Online / e-Learning  
"Practical knowledge to use in your company"

### Vision

This course offers the contribution of scientific and technological knowledge and its practical implementation and engineering in a hot steel rolling mill for long products. Participants will acquire technical criteria and knowledge that can be used in their rolling mill, in the development of new pass designs, in the expansion of the product range and steel qualities, in the understanding of rolling issues, in solving quality problems, in selecting heating practice and energy consumption, fundamentals of roll pass design for long products, semis design, rolling mill down time reduction, production yield optimization, revamping aspects, a vision of the sector and a long etcetera. This course will provide attendees with tools to identify, understand and overcome problems arising in a rolling mill, and deal with them, together with a vision of development of any rolling mill.

There is no doubt this course can benefit your company. Practical knowledge, based in technical and engineering principles that can be used directly in your rolling mill to enhance productivity is one of the best things you can bring in your company.

### Program description and objectives

The hot rolling of long products requires to focus on three main aspects that are reviewed in this course, steel as material and different qualities that can be obtained, long product roll pass design for different sections, and aspects of productivity, layout and facilities. All these contents are not disconnected one from each other, and are actually intimately related among them.

An initial view of the market and productions as a global sector y followed by a vision of rolling mills configuration and Layout, followed by a metallurgical overview of the steel as a

material together with its behavior in a rolling mill will be described related to product quality, product mechanical properties, 'new' qualities and to act about them.

A revision of roll pass design for long products is to be made, including specific aspects for different shapes, providing an overview of methods, calculations and parameters towards the development of new pass design and how to review existing roll pass designs. All parameters (temperature, groove shape and material shaping, guiding, etc) and their influence will be explained.

An overview of productivity and overall process efficiency will be described from the end of a continuous casting to the final product stock yard and certification, including a revision of quality issues and how to manage them from an overall view and specific improvements.

This v2 of year 2021 expands on different contents, especially the different calculation methods in the design of rolling grooves, total magnitude calculations, finite element method (FEA) and network of independent points are shown and explained.

## Style and learning

This course is oriented towards a practical profile because the content and technical material is explained using a certain visualization in the exposition of the concepts, which the student can identify in their professional environment, or their company environment, and provoking and accepting any discussion or questions that may arise from students through the platform's forums, chat and messaging, promoting addressing all content in an interactive study dynamic,

## Attendee profile

Any rolling mill plant staff and/or personnel will find this course suitable, the following positions will find good value in this training course:

- **Plant managers:** the described content makes it evident, they can improve in projects focusing, activity assessment, BPM and Dashboards.
- **Plant Assistants, supervisors and Foremen:** This course will speed up their learning curve and will let them understand the overall technics in a rolling mill together with specific knowledge to apply.
- **Engineers:** they will obtain a greater understanding of roll pass design, metallurgy and overall process key parts and issues.
- **Roll Shop managers and technical people:** they will obtain further expertise in roll pass design, guiding, etc, plus process overview and metallurgy.
- **Mill rollers:** they will understand how the process is designed, why things happen and the purpose of many different steps and technics in a rolling mill, so they will gain knowledge to solve problems and keep rolling mill rolling.
- **Quality managers:** these contents will let them improve their expertise and gain new knowledge in specific products, process areas and design, material analyzing, product defects, claims, product specifications and norms.
- **Maintenance managers:** this course will let them understand the purpose of installations to establish criteria for maintenance strategies.
- **Sales:** this course is also very interesting for sales managers and personnel, since we will describe technologies affecting product quality, possible proposals to widen product ranges offer, product defects and claims and product specifications and norms.

## Contents

### Module 1: Global market and Productions Vision, and rolling mill processes

- Sector vision
- General overview of hot rolling processes
- Enegetic-Environmental vision

## **Module 2: Metallurgical overview of the hot steel rolling process**

- Steel structure and transformations
- Metallurgical temperatures and the rolling mill
- Grain structure and distribution
- Chemical composition and alloying elements
- Metallurgical Strategies and chemical composition
- Steel composition and final steel quality
- Thermomechanical treatments and final quality of steel

## **Module 3: Roll Pass Design**

- Constant volume and material flow
- Pass filling and not filling
- Rolling conditions
- Start of the case of flat and bar shapes rolling (cases of theory-practical application will be presented constantly throughout the course)
- Types of rolls
- Plastic yield stress and influencing factors
- Temperature, profiles and round
- Roll groove dimensions
- Practical development of bar caliber
- Force, Moment, Power & Motors
- Roll Pass design for Profiles
- Roll Pass design for bar
- Initial sections, number of stands and passes
- Rolling defects and how to avoid them

## **Module 4: Rolling mill facilities, productivity and efficiency**

- Reheating furnace, types and strategy
- Rolling mill production capacity
- Initial sections definition
- Layout influence in quality
- Finishing mill
  - Cooling
  - Cutting
  - Straightening
  - Stacking & Labelling
- Quality certification systems, migration to ISO 9001:2015

## ONLINE TRAINING – e-Learning

This course is offered as online training, including contents structured in the platform and open messaging platform and forums where questions and discussions can be proposed and discussed among all, tutor and participants. Live sessions are not planned but could be proposed and approved by ATEC+ID. To register for the course, Please send an e-mail to us at [info@atecid.com](mailto:info@atecid.com), or you can use our [contact webpage](#), so we can book a seat for you.

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Chartered Engineer, registered in the Engineering Council (UK) and Industrial Environment Management Master, with extensive experience in the sector and performance of different functions and in different departments, as well as external consultant from year 2006.