INNOVAL

Aluminium Rolling Technology Course.

This course contains the following modules:

Aluminium Market Dynamics & Drivers.

- Economics of rolling
- Business cycles
- Future trends

Aluminium Casting Overview.

- Outline of the process routes continuous casting and direct chill casting
- Metal conditions at various stages during casting
- Machinery used in casting

Process & Machinery Overview.

- Outline of Aluminium process routes
- Major components of reversing and hot mills, tandem mills and cold mills
- Outline of machinery used
- Types of actuator in rolling mills

Mechanics of Rolling.

- Yield criteria
- Friction hill
- Factors determining rolling load
- Closed and open gap rolling
- Attenuation

Tribology in Aluminium Rolling.

- Friction and lubrication basic principles
- Interaction of rough surfaces
- Role of additives
- Hot and cold rolling oils
- System maintenance
- Filtration

Process Metallurgy.

- Alloy choice
- Microstructure
- Strengthening mechanisms
- Annealing

Finishing Overview.

- Outline of finishing line process routes
- Outline of machinery used
- Affects of processing on product quality

Thermal Aspects of Rolling.

- Heat sources and sinks
- Temperature distributions in rolls and strip
- Design of roll spray cooling systems
- Strip cooling

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Surface Generation & Surface Defects.

- Surface generation during rolling
- Oil entrapment
- Strip brightness control
- Scuffing
- Types of defect
- Reduction marks
- Surface inspection

Automotive Aluminium & Visit to JLR.

- Overview of Aluminium cars
- Introduction to the manufacturing process
- Visit and tour of Jaguar Land Rover plant

Introduction to Control.

- Open and closed loop control systems
- PID control and gain determination
- Ziegler-Nichols testing
- Use of feedback

Mechanics of Profile & Flatness.

- Definitions of profile and flatness
- Sources of variation
- In-process specification and targets for control

Mill Vibration.

- Sources of vibration in cold mills
- Vibration modes
- Mechanical defects & vibration

Automatic Gauge Control.

- Total gauge description
- Gauge control loops
- Measurement devices
- Different methods of gauge control in current use

Measurement & Control of Profile.

- Measurement of profile
- Actuators for control
- An integrated control strategy
- Scheduling, setup, adapted setup & in-coil strategies

Data Workshop.

- Introduction of data analysis and IBA software
- How to interpret rolling mill data and create meaningful templates

Automatic Flatness Control.

- Definition
- I-units
- Different types of off-flatness
- Relation with stress
- On-line measurement
- Flatness control actuators
- Strategies to control flatness

Wrap-up and Q&A Session.

- Interactive session with Innoval's experts
- Wrap-up of the week

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Sample Agenda

Innoval Technology Ltd. Aluminium Rolling Technology Course 2025

Monday	08:15 BST Arrival
08:30	Introduction
09:15	Aluminium Market Dynamics & Drivers
10:00	Break
10:15	Aluminium Casting Overview
11:15	Break
11:30	Process & Machinery Overview
13:00	Lunch
13:45	Mechanics of Rolling
15:00	Break
15:15	Mechanics of Rolling Workshop
16:00	Tribology in Aluminium Rolling
17:30	End of the Day
18:00	Social Event

Tuesday	08:15 BST Arrival
08:30	Process Metallurgy
09:30	Process Metallurgy Workshop
10:30	Break
10:45	Thermal Aspects of Rolling
12:45	Lunch
13:30	Thermal Aspects of Rolling Workshop
14:00	Surface Generation
15:00	Break
15:15	Surface Defects / Lab Workshop
16:15	Finishing Overview
17:30	End of the Day

Wednesday	08:15 BST Arrival
08:30	Introduction to Control
09:00	Control Workshop
09:45	Break
10:00	Mechanics of Profile and Flatness
11:45	Data Workshop
12:45	Lunch
13:30	Automatic Gauge Control
15:00	Automatic Gauge Control Workshop
16:30	Mill Vibration
17:30	End of the Day
18:00	Social Event

Thursday	08:15 BST Arrival
08:30	Measurement & Control of Profile
10:00	Measurement & Control of Profile Workshop
11:30	Break
11:45	Automatic Flatness Control
12:45	Group Photo & Lunch
13:45	Automatic Flatness Control
14:45	Automatic Flatness Control Workshop
15:45	Break
16:00	Automotive Aluminium
17:00	Summary & Wrap-up
17:30	End of the Day

Friday	07:00 BST Arrival
07:00	Travel to JLR
09:30	Course Visit & Tour at Jaguar Land Rover (JLR)
12:00	Travel to Birmingham International Rail Station
12:45	Course Finish

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