Aluminium Rolling Technology Course

This course contains the following modules:

**The Business of Rolling**
- 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

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

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

**Mechanics of Rolling**
- Yield criteria
- Friction hill
- Factors determining rolling load
- Closed and open gap rolling
- Attenuation
Process Metallurgy
• Alloy choice
• Microstructure
• Strengthening mechanisms
• Annealing

Thermal Aspects of Rolling
• Heat sources and sinks
• Temperature distributions in rolls and strip
• Design of roll spray cooling systems
• Strip cooling

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

Mechanics of Profile & Flatness
• Definitions of profile and flatness
• Sources of variation
• In-process specification and targets for control

Data Workshop
• Introduction of data analysis and IBA software
• How to interpret rolling mil data
• How to create meaningful templates

Mill Vibration
• Vibration modes in a cold mill
• Mechanical defects cause mill vibration
• To know what causes 3rd and 5th octave chatter and their potential solutions

Introduction to Control
• Open and closed loop control systems
• PID control and gain determination
• Ziegler-Nichols testing
• Use of feedback
Automatic Gauge Control
• Total gauge description
• Gauge control loops
• Measurement devices
• Different methods of gauge control in current use

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

Aluminium Rolling Lubrication
• Friction and lubrication basic principles
• Interaction of rough surfaces
• Role of additives
• Hot and cold rolling oils
• System maintenance
• Filtration

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

For more information please contact:

Helen Forrest
Tel: +44 (0) 1295 702844
Mobile: +44 (0) 7793 632986
helen.forrest@innovaltec.com