

## Overview of metallurgical processes - Unit operations and their position in steel and non-ferrous flowsheets

This session has its focus on an introduction and overview of processes used in the steel and non-ferrous industry. Starting from ores, the industry manages to produce several pure metals and alloys with a high efficiency. Using the basic principles of thermodynamics and phase separation, metallurgical reactors have been designed, which have been in use for several decades – but still, regularly new processes break through. Especially the need to handle recycled materials has changed the metallurgical landscape. Every metal has its own production route, but factories also focus more and more on several metals, and increasingly link with other plants around the world.

**09.30:** Registration

**10.00:** Unit processes in metallurgy

Ore beneficiation

- Comminution, sorting, flotation

Pyrometallurgy

- Sintering, roasting
- Blast furnace, shaft furnace, cupola
- Electric arc furnace (EAF), submerged arc furnace (SAF)
- Rotary furnace, reverberatory furnace
- Rotary kiln, rotary hearth furnace
- Convertor, TBRC
- Flash smelting, QSL, Kivcet
- Top submerged lance (TSL), submerged plasma

Hydro- and electrometallurgy

- Leaching
- Purification
- Electrowinning
- Electrorefining

**12.30:** Sandwich lunch

**13.30:** Flowsheets for iron production

- Oxygen steelmaking route
- Electric steelmaking route
- Ferro-alloys

**14.30:** Flowsheets for non-ferrous metals production

- Zinc roasting-leaching-electrowinning
- Copper flash smelting and TSL route
- Lead battery recycling and impact for classical routes
- Metal refining
- Waste: zero waste philosophy and dedicated waste treatment plants

**15.45-16.00:** Opportunity for discussion

**Aim:**

After the course all participants have an overview of the metals industry and can position their company in the landscape of metallurgy. They know the purpose and principles of the main industrial processes.

**Method:**

The course will tackle the theory of the topics listed above and an interactive approach including questions is applied to ensure that everything was understood. Due to the multitude of metals and flowsheets, a number of examples may be selected for the course, with other course material to be studied at home. An emphasis will be put on the sectors of course participants.

**Who should attend:**

The course will be given in English and aims at people active in the metal processing industry. The course can be a refreshment of the metallurgical principles for engineers, or give hands-on metallurgists a solid theoretical background.

**Price:**

450€ per person per day (excl. VAT)

1600 € per person for the full course program (4 days) (excl. VAT)

**When:** Friday 15 April 2016  
**Subscription deadline:** Friday 8 April 2016 (annulation is possible before this date)  
**Location:** InsPyro, I&I Leuven, Kapeldreef 60, 3001 Belgium  
**Language:** English

**Subscribing:**

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