Steelmaking Process Training: DRI, Electric Arc Furnace and Continuous Casting

25 – 29 October 2027
London - Central London four-star



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Introduction:

Steelmaking process training covering DRI, electric arc furnace and continuous casting is a 1-week course for process and metallurgical engineers, melt-shop and caster operators, and quality and planning staff in steel plants, ending with a Melt-Shop Performance Review for a case DRI-EAF plant. Plants lose margin when DRI metallisation drifts, arc furnaces run long tap-to-tap cycles, ladle chemistry misses its window and casters produce breakouts, cracks and downgraded heats. Nominees already work in a melt shop, caster or rolling mill and analyse heat logs, defect records and KPI data through case studies. CoreConcept Training Center delivers this steelmaking process course.

Course Objectives:

- Compare the blast furnace and oxygen converter route with the DRI-EAF and scrap-EAF routes by iron units, energy and product range
- Assess iron ore pellets and DRI or HBI quality for metallisation, carbon and gangue and set charging practice for the arc furnace
- Run an electric arc furnace heat from charging to tapping with foamy slag, power and electrode settings that cut kWh per tonne
- Specify ladle furnace and vacuum degassing steps that bring each heat to target chemistry, temperature and cleanness for the caster
- Diagnose breakouts, cracks, segregation and inclusion defects in continuous casting and link them to rolling yield and product testing
- Produce a melt-shop performance review that ranks energy, yield, consumable and CO2 improvement actions for a DRI-EAF plant

Target Audience:

- Process and metallurgical engineering staff who set furnace, ladle and caster practice and approve process changes
- Melt-shop and caster operating staff who run heats, control slag and power and respond to casting upsets
- Quality staff who release heats, test samples and track defect and downgrade records
- Production planning staff who schedule heats, sequences and caster changes against tonnage and yield targets
- Rolling mill staff who receive billets, blooms and slabs and report surface and internal defects back to the melt shop

Course Outline:

Day 1: Steelmaking Routes, Iron Units and Melt-Shop Baseline

- Blast Furnace and Oxygen Converter Route Flowsheet Review
- DRI-EAF and Scrap-EAF Routes Compared by Iron Units
- Iron Ore Pellet Quality Indices for Direct Reduction Feed
- Steel Product Families From Billet, Bloom and Slab Casters
- Melt-Shop KPI Set for Energy, Yield and Consumables

Day 2: Direct Reduction and Electric Arc Furnace Technology

- Shaft Furnace Direct Reduction With Reformed Gas and Hydrogen
- Metallisation, Carbon Content and Gangue in DRI and HBI
- Hot DRI Charging Versus Cold DRI and HBI Handling
- AC and DC Electric Arc Furnace Power Supply Design
- Electrode Regulation, Transformer Taps and Arc Length Control

Day 3: Arc Furnace Operation, Ladle Metallurgy and Caster Practice

- EAF Heat Cycle From Charging to Tapping Sequence
- Foamy Slag Practice With Carbon and Oxygen Injection
- Ladle Furnace Reheating, Argon Stirring and Desulphurisation
- Vacuum Degassing, Deoxidation and Alloy Trimming Before Casting
- Tundish, Mould Powder and Secondary Spray Cooling Settings

Day 4: Casting Defects, Rolling, Product Quality and Low-Carbon Options

- Breakout Causes From Superheat, Casting Speed and Mould Turbulence
- Surface Cracks, Centreline Segregation and Inclusion Defect Diagnosis
- Hot and Cold Rolling Reheating, Reduction and Mill Yield
- Chemistry, Tensile and Inclusion Testing for Heat Release
- CO2 Intensity, Hydrogen DRI and Scrap Share Decarbonisation Options

Day 5: Case Study Melt-Shop Performance Review for a DRI-EAF Plant

- Case DRI-EAF Plant Data Pack and Heat Log Review
- Energy and Tap-to-Tap Variance Analysis for the Case Furnace
- Electrode, Refractory and Flux Consumption Benchmarking for the Case
- Casting Defect and Quality Rejection Pareto for the Case
- Melt-Shop Performance Review Completion and Peer Challenge

Skills You Will Gain:

- Steelmaking Route Evaluation
- Direct Reduced Iron Quality Assessment
- Arc Furnace Energy Control
- Secondary Refining Practice
- Continuous Casting Troubleshooting
- Heat Release Testing
- Melt-Shop KPI Analysis
- Steel Decarbonisation Screening

Why Attend This Course:

- Deliver a Melt-Shop Performance Review for a case DRI-EAF plant to the melt-shop manager or plant director, with ranked energy, yield and consumable actions
- Decide when to change DRI charging practice, foamy slag settings or casting speed using heat log and defect evidence rather than habit
- Avoid breakouts, downgraded heats and excess kWh per tonne by tracing each loss to the furnace, ladle or caster step that caused it
- Share the KPI set, defect diagnosis checklist and heat review format with shift teams, quality staff and planners

Conclusion:

Back at work, the participant gives the melt-shop manager or plant director a Melt-Shop Performance Review that ranks energy, yield, electrode and refractory consumption and CO2 actions for the DRI-EAF route. Engineering and planning staff use it to set charging, slag, ladle and casting practice targets and to decide which trials run first. After the first month of trials, the unit should review kWh per tonne, tap-to-tap time, casting defect rates and metallic yield against the baseline and reset the action list.

Frequently Asked Questions FAQ:

What should participants know before the steelmaking process course on DRI, electric arc furnace and continuous casting?

Participants should already work in or alongside a melt shop, caster, DRI plant or rolling mill and read heat logs or KPI reports. Bringing anonymised heat, energy or defect data from their own plant helps them apply the case work to their unit.

How does this steelmaking process course differ from a general metallurgy course?

This course follows the production chain from pellets and direct reduction through the arc furnace, ladle and caster to rolling and heat release. A general metallurgy course studies steel structure, heat treatment and failure analysis, which appear here only where they explain a process decision.

Why does DRI quality matter for electric arc furnace steelmaking?

DRI metallisation, carbon and gangue decide how much power, lime and time each heat needs. Low metallisation adds oxide to reduce in the furnace, and high gangue raises slag volume, so both lengthen tap-to-tap time and raise kWh per tonne and electrode use.

What does a participant take back from the steelmaking process course on DRI, electric arc furnace and continuous casting?

Each participant takes back a Melt-Shop Performance Review for a case DRI-EAF plant, with a KPI baseline, variance analysis, defect Pareto and ranked improvement actions, plus checklists for charging, slag, ladle and casting practice that can be adapted to their own plant.