

METAL MELTING BEST PRACTICES

LIVE ONLINE TRAINING | 19 – 20 MARCH 2026

Efficiency optimisation in the melting processes has become a great need due high costs associated with defects, scrap and improper mixes. Equipment and technology costs are also high hence the need to understand the best ways of controlling different variables when operating furnaces to avoid any defects.

Do not miss out on this training workshop which aims at uncovering solutions on how best you can incur less or no costs associated with melting defects and high energy consumption. In this discussion, delegates will review the principles of metallurgy, gaining a detailed understanding on different materials and tests conducted to ensure they are fit-for-use. It will further discuss the impact of temperature control, alloying as well as impurities handling to the whole melting process. Energy optimisation will also form part of this technical training amongst other critical issues such as safety, sampling techniques as well as pouring best practices

After Attending This Course You Will Be Able To

- Gaining insight into phase transformations
- Discussing different types of metal testing
- Optimizing charge calculations
- Different types of liquid steel temperature measurement
- Discussing the impact of poor temperature control
- Identifying different types of furnaces and operation best practices
- Furnace lining inspection and maintenance
- Evaluating the impact of alloying elements in different metals
- Linking alloying to corrosion kinetics for different materials
- Discussing causes of metal splash and furnace eruptions
- Handling impurities to optimize efficiency in melting
- Energy consumption and efficiency optimisation
- Uncovering the modern pouring techniques
- Slag and or dross control during metal pouring

Target Audience

- Foundry Manager
- Melt Shop Foremen
- Melting/Smelter Process Engineers
- Foundry or Smelter Supervisors/ Managers
- Foundry Metallurgists and Superintendents
- Smelters and Melters
- Furnace Operators and Furnace Assistant
- Quality Control Personnel
- Processors
- Technical Directors

Independent Training Management (Pty) Ltd

Tel: +27(0) 87 265 4063

Email: info@independenttraining.co.za

Website: www.independenttraining.co.za

METAL MELTING BEST PRACTICES

Reviewing the principles of metallurgy (Ferrous and Non-Ferrous)

- Analyzing the equilibrium phase diagram
- Gaining insight into phase transformations
 - Liquids
 - Solidus
 - Solidification
- Discussing precipitation and non-metallic inclusions

Chemical and material Testing

- Theoretical and visual demonstrations on chemical testing
- Discussing different types of metal testing
 - Tensile testing
 - Impact testing
 - Creep testing
- Elaborating on material fatigue
- Understanding corrosion (causes and impact)

Furnace Charging Procedures

- Charge furnace and charge bucket make-up
- Melt mix best practices
- Material grading and its impact
- Optimizing charge calculations
- Elaborating on melting composition

Temperature measurement and control techniques

- Different types of liquid steel temperature measurement
 - Disposable lances
 - Continuous dip measurement
 - Optical measurement systems
 - Thermocouple methods
- Continuous temperature measurement of molten steel
- Thermocouple accuracy checking and calibration
- Controlling pouring temperature
- Discussing the impact of poor temperature control

Furnace and furnace operations

- Identifying different types of furnaces and operation best practices
- Selecting and applying the best furnace for melting certain metals
- Understanding different mechanisms applicable for furnace linings and coil protection
- Furnace lining inspection and maintenance
- Uncovering the theory behind refractory

Purposes and methods of alloying

- Understanding different alloying elements
- Evaluating the impact of alloying elements in different metals
- Discussing the purpose of alloying
 - Strength enhancement
 - Corrosion resistance
 - Cost reduction
 - Lowering melting points
- Surface and heat treatment processes
- Linking alloying to corrosion kinetics for different materials

Addressing melting safety related issues

- Risks and hazards associated with melting
 - Wet charge materials, sealed scrap, bridging
- Discussing the significance of quality control in melting processes
- Emphasizing on the role played by Personal Protective Equipment (PPE)
- Understanding why scrap metal has to be inspected and treated
- Discussing causes of metal splash and furnace eruptions
- Reducing possibilities of molten metal explosions

Optimising melting efficiency

- Raw and recycled materials efficiency optimisation
- Understanding the role played by impurities to the melting process
- Handling impurities to optimize efficiency in melting
- Discussing cause of melt loss and methods applicable to control metal loss
- Elaborating on fluxing and melt treatment for efficiency optimisation purposes
- Melt sampling procedures
- Energy consumption and efficiency optimisation
- Elaborating on how advancements in technology enhances efficiency

Pouring techniques

- Reviewing the traditional art of pouring
- Understanding the role played by ladles and ladle lining
- Evaluating the system of filters
- Uncovering the modern pouring techniques
- Controlling the pouring temperature and pouring speed
- Slag and or dross control during metal pouring
- Applying pouring methods which save on energy consumption

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Booking Contact (Approving Official) Mr/Mrs/Ms

Full Names: _____

Company name: _____

Direct Tel No: _____ E-mail: _____ Fax: _____

VAT No: _____

Address: _____

Signature _____

Person Responsible for Finance: _____ Direct Tel No: _____ Date of Payment: _____

BANKING DETAILS:

THIS INVESTMENT INCLUDES:

Independent Training Management Pty Ltd
Bank: FNB South Africa
Account Number: 62685879276
Branch Code: 251650
Branch: Randburg

THE FOLLOWING HEREBY CONFIRM ATTENDANCE TO THE WORKSHOP

Delegate1: Names _____

Position: _____ E-Mail: _____

Delegate 2: Names _____

Position: _____ E-Mail: _____

Delegate 3: Names _____

Position: _____ E-Mail: _____

Delegate 4: Names _____

Position: _____ E-Mail: _____

Delegate 5: Names _____

Position: _____ E-Mail: _____

All fees are current at the time of going to print; however, we reserve the right to change them.

2. Additional Delegate Rates:

Additional delegate rates apply when bookings are made at the same time on the same course.

3. Confirmation Instructions:

On receipt of this submitted booking form and payment or purchase order you will receive a confirmation letter by email confirming your participation in the training event. This includes a location map with directions and venue details and starting times.

4. Attendance:

Please note that no learner will be permitted to attend any training course without proof of payment or an order no.

5. Delegate Substitution:

Substitutes can be made at any time without incurring a penalty. Please inform us in writing so we can make the necessary arrangements for the new learner.

6. Payment:

Payment can be made by cheque or by electronic transfer, and must be received 5 working days prior to the commencement of the course.

Please quote the reference number from your invoice and organisation name so that payments can be tracked. All cancellations must be done in writing and emailed directly to Independent Training. Management Inform us immediately if you have to re-schedule or cancel the booking so that we can inform the caterers and conference venue.

The following charges apply if you cancel:

- 11 - 30 days before a course = 10% of the course fee
- 6 – 10 days before a course = 20% of the course fee
- 4 – 6 days before a course = 30% of the course fee
- 1-3 days before a course = 50% of the course fee