ABOUT THE COURSE

This course covers safety, the basics of electrical and mechanical features of electric arc furnaces, refractories, and the role of raw materials. The program will explore the fundamentals of electric furnace steelmaking technology, the use of energy inputs, the steelmaking process, electrodes and environmental concerns for electric steelmaking. Attendees will also have the opportunity to learn how their operation compares to industry benchmarks and hear about the latest developing technologies. The midpoint of the conference includes a plant tour followed by an experts roundtable and reception with an open forum to discuss questions and challenges. Attendees with a focus in specialty steelmaking will have the opportunity to attend a special breakout session to discuss decarburization, degassing and desulfurization, various refining processes, equipment and operations, an overview of ingot casting and practical aspects of bottom pouring.

SCHEDULE OF EVENTS

MONDAY, 3 FEBRUARY 2014

4 p.m.  
Registration

5:30 p.m.  
Welcome Reception

TUESDAY, 4 FEBRUARY 2014

7 a.m.  
Registration and Continental Breakfast

8 a.m.  
CMC Steel Alabama Preview  
Jonathan Ridgeway, CMC Steel Alabama

8:30 a.m.  
Safety as a Culture Change  
Fred Rine, FDRsafety

9:30 a.m.  
Break
Chemistry of EAF Steelmaking
Larry Heaslip, Interflow TechServ Inc.

The chemistry of steelmaking with particular reference to the electric arc furnace (EAF) is presented in a manner that is designed to interest, involve and inform both those persons having little or no background or previous training in the chemical metallurgy of steel production, as well as those persons who do have such background. The topics covered will relate to the interactions between the thermal behavior, physical behavior, and chemical behavior of liquid steel and slag during the melting, alloying, and removal of undesirable elements from steel, with the goal of improved understanding of the practices and procedures that are undertaken in an EAF shop to produce heats of quality liquid steel ready for casting.

noon
Lunch

1 p.m.
Chemistry of EAF Steelmaking, cont’d
Larry Heaslip, Interflow TechServ Inc.

2:15 p.m.
Break

2:30 p.m.
Chemistry of EAF Steelmaking, cont’d
Larry Heaslip, Interflow TechServ Inc.

3:45 p.m.
Chemical and Electrical Energy Inputs and EAF Performance
Sam Matson, CMC Americas

WEDNESDAY, 5 FEBRUARY 2014

7 a.m.
Continental Breakfast

8 a.m.
Part I: EAF Designs and Operations
Jeremy Jones, Tenova Core

Over the period from 1980 to 2005, EAF operations went through a rapid evolution as facilities pushed to increase productivity and improve product quality. Chemical energy use in the EAF tripled in magnitude, and many new technologies were introduced. In addition, many different EAF designs were introduced, aimed at heat recovery from the offgas, reducing electrode consumption, increasing productivity and providing greater flexibility in the choice of raw materials. This section of the seminar focuses on EAF technologies and designs implemented over the past 25 years.
The ladle metallurgy furnace (LMF) transforms raw steel from the EAF into a castable product and delivers it to the caster at the right time, temperature and chemistry (bulk and inclusion chemistry). The ability to do so is determined by equipment and processing approach, as well as the quality from the EAF. A review of killing and alloying the steel, making a slag, controlling temperature and non-metallic inclusions is also given.

What makes scrap blending so difficult is tramp residual element control. An in-depth explanation is provided of the sources of tramp residual elements and the effects on both the specialty steelmaker and scrap supplier.

The presentation will include the latest technologies of EAF burner, oxygen and carbon injection systems, as well as the general theory and strategy of their use. A strong emphasis on the safe use of oxygen will be made.

Economic conditions have a major impact on the capital investment requirements and demand for steel products. Understanding the impact of macro-economic policies and their legacy effects on the steel industry allows us to know how we got here and where we might be going in market demand for steel products and in the development of EAF operations.
2:15 p.m.
**Arc Furnace Regulation System**  
Reinzi Santiago, Tenova Core  
This discussion focuses on the arc furnace regulation system, a technology that greatly reduces harmonics, flicker and energy consumption.

3:15 p.m.
**EAF Energy Efficiency and Associated Environmental Considerations**  
Doug Zuliani, Goodfellow  
This paper will focus on improving EAF energy use and recovery as a means to simultaneously reduce operating costs, improve yield and minimize emissions. Major energy losses and sources of offgas emissions will be identified for a typical scrap melting practice. The focus will be on first optimizing “in-EAF” energy inputs as efficiently as possible for the production of steel. Various technologies designed to improve in-EAF process energy efficiency and the resulting impact on gaseous emissions will be explored. Once in-EAF energy efficiency has been optimized, the discussion will focus on the efficient recovery of remaining energy leaving the EAF in the offgas. Heat recovery technology and possible uses for the recovered energy will be explored. The net impact of these technological improvements on energy use and related emissions will be summarized.

4:15 p.m.
**Refractories and Slags for Quality Specialty Steel Production**  
Jim Conrad, Fedmet Refractories  

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**FRIDAY, 7 FEBRUARY 2014**

7 a.m.  Continental Breakfast

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**EAF TRACK**

8 a.m.
**Graphite Electrode Manufacture and Use**  
Jerry Castleman, Showa Denko Carbon Inc.  
The equipment and raw materials used in the manufacture of graphite electrodes and their use will be discussed.

9 a.m.
Break

9:15 a.m.
**The Selection and the Use of Refractories in Electric Arc Furnaces**  
Tomas Richter, North American Refractories Co.  
The chemical, physical and application attributes will be presented for the refractories which are used during the electric arc furnace steelmaking process. The proper refractory selection will be summarized in the relationship with the operational and metallurgical parameters of the EAF steelmaking process.
10:15 a.m.
Break

10:30 a.m.
Benchmarking the Modern Meltshop
Wayne Adams, GrafTech International Holdings Inc.
This presentation will focus on providing insight into achieving maximum efficiency in an EAF. Industry statistics showing productivity and power inputs will be presented, as well as time utilization, heats per day, tons per hour, and electrode and energy consumption. Comparisons will be made between worldwide geographic regions and various types of furnace. The presentation will finish with some key steps for continuous improvement.

8 a.m.
Refining of Specialty Steels
Ian Masterson, Praxair Inc.
This presentation covers decarburization, degassing and desulfurization of specialty steels, along with a brief overview of the various refining processes, equipment and operations.

9 a.m.
Break

9:15 a.m.
Introduction to Casting of Specialty Steels and Alloys
Mark Rodney, Latrobe Specialty Metals Inc.

10:15 a.m.
Break

10:30 a.m.
Introduction to Casting of Specialty Steels and Alloys, cont’d.
Mark Rodney, Latrobe Specialty Metals Inc.

REGISTRATION FEES
Advance registration by 20 December 2013: Member US$1,095, Non-member US$1,310. Registration fees after 20 December 2013: Member US$1,195, Non-member US$1,410. Registration fees include Monday welcome reception, Tuesday through Friday continental breakfast, Tuesday through Thursday lunch, continuous breaks, Wednesday reception, plant tour and a course workbook.

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COMPANY DISCOUNT
Three or more individuals from the same facility attending any one seminar can receive a 10% discount per person. All registrations must be received together along with payment to qualify for the discount. Not applicable with any other discount.