



## Upcoming Events

Maintenance & Reliability for the Next Generation

10-12 September 2019  
Embassy Suites by Hilton Indianapolis Downtown  
Indianapolis, Ind., USA

Pipe and Tube – A Practical Training Seminar  
23-26 September 2019  
Doubletree Birmingham Perimeter Park  
Birmingham, Ala., USA

Continuous Casting – A Practical Training Seminar  
21-24 October 2019  
Holiday Inn Downtown Memphis  
Memphis, Tenn., USA

The Making, Shaping and Treating of Steel: 101  
29-30 October 2019  
Hilton Milwaukee City Center  
Milwaukee, Wis., USA

Plant Tour:  
CMC Steel Texas

# Secondary Steelmaking Refractories

A Practical Training Seminar

14-17 October 2019

Hilton Palacio Del Rio  
San Antonio, Texas, USA



Association for Iron & Steel Technology  
186 Thron Hill Road  
Warrendale, PA 15086-7528 USA  
+1.724.814.3000 • Fax +1.724.814.3005 • AIST.org

NON-PROFIT  
U.S. POSTAGE  
PAID  
Pittsburgh, PA  
Permit No. 498

## About the Program

Secondary steelmaking refractory maintenance is vital to both productivity and safety in a meltshop and caster. It is important for those involved to have a thorough understanding of the basic concepts of refractory system design. Consultants, suppliers and recognized industry experts have developed a curriculum to educate attendees on the following topics: refractory raw material selection; properties, application and limitations of refractories; theory and application of insulation; design and application of stir plugs, lances and slidegates; free opens, refractory handling, installation and pre-heating; ladle secondary steelmaking — LMF; and casting requirements and wear mechanisms.

Presentations will provide data from steelmaking operations, and attendees will benefit from the practical experience of the presenters, including the application of the latest tools and techniques being used. Open discussions will allow participants to gather additional information and network with attendees and instructors.

## Who Should Attend

This conference is intended for steelmaking operations personnel, maintenance and supervisory employees. Refractory suppliers and service suppliers should also attend. The AIST Ladle & Secondary Refining and Refractory Systems Technology Committees strongly believe that this course provides the basic knowledge for a better understanding of secondary steelmaking, refractory and insulating systems.

## Registration Includes

Tuesday and Wednesday breakfast and lunch, reception, Thursday breakfast, plant tour with bus transportation, and a course workbook or flash drive including presentations.

## Hotel Accommodations

A block of rooms has been reserved at the Hilton Palacio Del Rio. Please call the hotel at +1.210.222.1400 by 23 September 2019 to secure the AIST discount rate of US\$189 per night for single/double occupancy.

### AIST Members

US\$845

by 2 September 2019

US\$945

after 2 September 2019

### AIST Non-Members

US\$1,090

by 2 September 2019

US\$1,190

after 2 September 2019

## Professional Development Hours

This course may qualify for up to 14 Professional Development Hour (PDH) credits. Each attendee will receive a certificate listing the quantity of PDH credits earned for the course. This course is not approved for PDH credits in New York, Florida, North Carolina and Oklahoma.

## Organized By

AIST's Ladle & Secondary Refining and Refractory Systems Technology Committees.



AIST.org

# Schedule of Events



## Monday, 14 October 2019

4 p.m.  
Registration

## Tuesday, 15 October 2019

7 a.m.  
Registration and Breakfast

8 a.m.  
**Keynote address: Safety Culture at CMC Steel Texas**  
Matthew Foxell, Commercial Metals Company – Texas

8:30 a.m.  
Introductions

8:45 a.m.  
**Raw Materials, Bricks and Shapes and Monolithics**  
Ruth Engel, Refractory Consulting Services  
The seminar will begin by presenting the raw materials used in the manufacture of refractories, why they are used, their availability and expected characteristics. Using this information, the raw materials will be combined to make bricks or shapes and the role the different components play on their properties will be discussed. This discussion will extend to monolithics, where additional parameters like installation and dry-out will be covered.

9:45 a.m.  
Break

10 a.m.  
**Refractory Brick Production**  
Korey Skala, HarbisonWalker International  
Production of refractory bricks from raw material to finished product.

10:45 a.m.  
Break

11 a.m.  
**Ladle Construction Design and Insulation**  
Rob Doty, IMACRO Inc.  
This presentation features a wide-ranging discussion about the many options in ladle refractory design. The basics of heat transfer will then be covered, from molten steel through refractories to ladle shells, followed by insulation choices, how they affect ladle shell temperatures, and refractory expansion dynamics.

Noon  
Lunch

1 p.m.  
**Ladle Pre-Heat and Handling**  
Jimmy Barrett, Allied Mineral Products Inc.  
Steel ladles will be covered in detail, including pre-heating, refractory wear mechanisms and measuring options.

1:45 p.m.  
Break

2 p.m.  
**Ladle Burner, Technical and Controls**  
Dale Smith, Honeywell Process Solutions

3 p.m.  
Break

3:15 p.m.  
**Tap-to-Cast Operations**  
Harriet Dutka, SANGRAF International  
This presentation is a brief overview that focuses on answering the “why’s” of certain practices and procedures in steelmaking. If you are new to steelmaking or are in a non-technical role, this presentation will answer many of the questions you would like to ask.

4 p.m.  
**Panel Discussion and Reception**  
Moderator: Jimmy Barrett, Allied Mineral Products Inc.  
Panelists: Harriet Dutka, SANGRAF International; Helmut Oltmann, Nucor Steel–Berkeley; and Rob Doty, IMACRO Inc.

## Wednesday, 16 October 2019

7 a.m.  
Breakfast

8 a.m.  
**Safety: Past/Present/Future**  
John Panconi, BISCO Refractories Inc.  
Discussion will focus on safety and its progression through the years.

8:30 a.m.  
**Refractory Materials Testing and Product Selection**  
Rakesh Dhaka, U. S. Steel Research and Technology Center  
Standard test methods and their application in evaluating and selecting refractory materials will be discussed.

9:30 a.m.  
Break

9:45 a.m.  
**Secondary Steelmaking Process – LMF**  
Helmut Oltmann, Nucor Steel–Berkeley  
This presentation provides a review of the ladle metallurgy furnace (LMF) processes to modify chemistry and temperature of the steel in the ladle and their impact on refractories.

10:45 a.m.  
Break

11 a.m.  
**Pros and Cons of Infrared and Analog Cameras on Refractory Applications**  
Tom Connors and John Lewis, Connors Industrials Inc.  
Camera applications for the refractory manager can be useful in recognizing system limitations.

11:30 a.m.  
**Ladle Laser Program**  
Sean Guy, Process Metrix LLC

Noon  
Lunch

1 p.m.  
**Stir Plugs, Lances, Slidegates and Tundish Gates**  
Carl Corbin, Vesuvius USA

2 p.m.  
Break

2:15 p.m.  
**Total Refractory**  
Fred Adkins, HarbisonWalker International.

3:15 p.m.  
Break

3:30 p.m.  
**Principles of Mold Flux Technology**  
Darrell Sturgill, Imerys Steelcasting USA Inc.  
Participants will receive an overview of continuous casting fluxes from production through their end use. Included in the discussion are continuous casting flux selection criteria.

4:15 p.m.  
**Flow Control Products**  
Josh Kaser, RHI Magnesita  
This presentation will go into detail on the isostatic products of the refractory industry. This includes ladle shrouds, stopper rods and tundish shrouds.

## Thursday, 17 October 2019

7 a.m.  
Breakfast



8 a.m.  
**Plant Tour of CMC Steel Texas**

Noon  
Return From Plant Tour and Adjoin