

# Iron & Steel Technology

July 2009

Vol. 6, No. 7

*"...advancing the technical development, production, processing and application of iron and steel"*



33

Billet rhomboidity became considerably less of an issue following the caster upgrade at Nucor Steel Seattle.



84

Automatic strand measurement systems can provide rapid, accurate, repeatable results that ensure greatly improved continuous caster efficiency.

## Special Features

- 95** AISTech 2009 President's Award Breakfast Keynote Address
- 103** 2009 AIST Award Recipients

## Features

### *Continuous Casting Technologies*

- 33** Nucor Steel Seattle: Improvements Resulting From the Modernization of the 4-Strand Billet Caster  
*J. Gregord*
- 42** Experience With an Innovative On-Line Inclusion Determination System for Liquid Steel  
*R.P. Stone, C.C. Liu and P.C. Glaws*
- 49** Control of Gas Bubbles and Slag Layer in a Ladle Furnace by Electromagnetic Stirring  
*U. Sand, H. Yang, J-E. Eriksson and R. Bel Fdhila*
- 60** Thermomechanical Modeling of Beam Blank Casting  
*L.C. Hibbeler, K. Xu, B.G. Thomas, S. Koric and C. Spangler*
- 75** Mold Level System Upgrade at ArcelorMittal Dofasco's No. 1 Caster  
*C. Singh, X. Rabec and M. Dussud*
- 84** Recent Developments in Strand Condition Monitoring Devices  
*A.I.F. Leek*

Published by AIST  
186 Thorn Hill Road  
Warrendale, PA 15086 USA  
Phone: (724) 814-3000  
Fax: (724) 814-3001  
[www.AIST.org](http://www.AIST.org)



### *About the cover*

John J. Ferriola, chief operating officer of steelmaking operations for Nucor Corp. and the 2009 AIST Steelmaker of the Year, is pictured before the Castrip® facility's laminar cooling table at Nucor Steel-Indiana, Crawfordsville, Ind. Ferriola's keynote address from the President's Award Breakfast at AISTech 2009 in St. Louis, Mo., begins on page 95. Cover photo courtesy of Shawn Spence Photography.

Do you have a cover-worthy photo? Submit it for consideration to Joann Cantrell, [jcantrell@aist.org](mailto:jcantrell@aist.org).

**Publisher**

Ronald E. Ashburn

**Editor**

Joann Cantrell

**Managing Editor**

Karen D. Hickey

**Production Editor**

Janet A. McConnell

**Graphic Designer**

Christopher P. Brown

**Production Assistant**

Carolyn A. Trobaugh



## 2009–2010 Officers and Directors

**President**

**Anthony R. Bridge**, Vice President — Operations,  
United States Steel Corporation, Pittsburgh, Pa.

**First Vice President**

**William P. Breedlove**, Vice President — Business Development and  
Engineering, Harsco Metals North America, Cranberry Twp., Pa.

**Second Vice President**

**R. Joseph Stratman**, Executive Vice President,  
Nucor Corp., Charlotte, N.C.

**Past President**

**Andrew S. Harshaw**, Executive Vice President — Operations,  
ArcelorMittal USA, Burns Harbor, Ind.

**Officer-at-Large**

**Kent D. Peaslee**, F. Kenneth Iverson Steelmaking Chair,  
Missouri University of Science and Technology, Rolla, Mo.

**Officer-at-Large**

**Michael P. Mueller**, Vice President — Steel Operations,  
Gerdau Ameristeel, Tampa, Fla.

**Officer-at-Large**

**Thomas J. Cera**, Chief Operating Officer,  
Severtal North America Inc., Dearborn, Mich.

**Treasurer**

**Theodore F. Lyon**, Managing Director,  
Hatch Associates Inc., Pittsburgh, Pa.

**Secretary**

**Ronald E. Ashburn**, executive director,  
Association for Iron & Steel Technology, Warrendale, Pa.

**Directors**

**Danielle Q. Baird**, Latrobe Specialty Steel Co., Latrobe, Pa.

**James M. Baur**, AK Steel Corp., Middletown, Ohio

**Paul M. Behnke**, United States Steel Corporation, Gary, Ind.

**Michael F. Bigowsky**, Globex Corp., Canfield, Ohio

**Brendan G. Brophy**, North Star BlueScope Steel LLC, Delta, Ohio

**Butch Collins**, Gallatin Steel, Ghent, Ky.

**James A. Dunn**, ArcelorMittal Dofasco Inc., Hamilton, Ont., Canada

**Dennis A. Foster**, Nucor Steel—Texas, Jewett, Texas

**Peter Harschnitz**, ArcelorMittal Dofasco Inc., Hamilton, Ont., Canada

**Frank Jere**, DTE Energy Services, Monroe, Mich.

**Michael P. Olson**, California Steel Industries Inc., Fontana, Calif.

**Ronald J. O'Malley**, Nucor Steel—Decatur, Decatur, Ala.

**William C. Rotberson**, Nucor Steel—Berkeley, Mt. Pleasant, S.C.

**John C. Rotroff**, United States Steel Corporation, Gary, Ind.

**Veena Sahajwalla**, University of New South Wales,  
New South Wales, Australia

**Randy C. Skagen**, Nucor Steel Tuscaloosa Inc., Tuscaloosa, Ala.

**John G. Speer**, Colorado School of Mines, Golden, Colo.

**Donald R. Spencer**, Nucor Steel Tuscaloosa Inc., Tuscaloosa, Ala.

**Michael J. Strelbisky**, Tallman Bronze Co., Ont., Canada

**Michael Trainor**, ArcelorMittal Dofasco Inc., Hamilton, Ont., Canada

## AIST Transactions

**167****Advancements in Steel for Weight Reduction  
of P900 Armor Plate***R.A. Howell, J.S. Montgomery and D.C. Van Aken*

## Departments

- 4** Company Index
- 6** Industry News
- 12** Industry Statistics
- 20** Ask World Steel Dynamics
- 21** Personnel Spotlight
- 26** Safety First
- 27** Legal Perspectives
- 150** Steel Irony Cartoon
- 158** Employment Bulletin Board
- 159** AIST Crossword
- 160** Product & Equipment News
- 161** Marketplace
- 177** Advertisers Index
- 179** Steel Calendar

## Association News

- 24** AIST Foundation Update
- 118** Call for Nominations: 2010 AIST Awards
- 123** AISTech 2010 Call for Papers
- 127** AISTech 2010 Booth Reservation Form and  
Exposition Floor Plan
- 131** Committee News
- 135** Upcoming Specialty Training Conferences and  
Seminars
- 144** Member Chapters
- 150** New AIST Members
- 153** Material Advantage News

## Coming Next Month...

**Flat Product Rolling & Finishing  
plus a Review of AISTech 2009 and  
the Town Hall Forum**

## Iron & Steel Technology (ISSN 1547-0423)

Published monthly by AIST. Editorial and advertising offices at 186 Thorn Hill Road, Warrendale, PA 15086. Preferred Periodicals postage paid at Warrendale, Pa., and at additional mailing office. POSTMASTER: Send address changes to AIST, 186 Thorn Hill Road, Warrendale, PA 15086.

Statements and opinions given in articles, news items and advertisements in *AIST Iron & Steel Technology* are the expressions of contributors and advertisers, for which AIST assumes no responsibility. Publication does not constitute endorsement by AIST.

Single copy U.S., Canada and Mexico, \$16.00. Single copy other countries, \$20.00. Subscription price U.S., Canada and Mexico, \$125.00 per year. Subscription price other countries, \$155.00 per year (U.S. funds). Printed in U.S.A.

Copyright 2009, AIST. All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without permission in writing from the publisher.

Indexed by Engineering Index Inc., 345 E. 45th St., New York, NY 10017, by Applied Science and Technology Index, H.W. Wilson Co., 950 University Ave., Bronx, NY 10452 and by Ulrich's International Periodicals Directory — US ISSN 1547-0423, R.R. Bowker Co., 205 E. 42nd St., New York, NY 10017. Microfilmed by ProQuest Information and Learning Co., Ann Arbor, Mich.

Publications Mail Agreement No. 40030979. Return undeliverable Canadian addresses to: P.O. BOX 875, STN A, Windsor ON N9A 6P2 Canada.