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AIST
ASSOCIATION FOR IRON & STEEL TECHNOLOGY

CONFERENCE AND EXPOSITION

GALVATECH

10TH INTERNATIONAL CONFERENCE ON ZINC AND ZINC ALLOY COATED STEEL SHEET

TORONTO, ONT., CANADA

HS²

THE 5TH INTERNATIONAL CONFERENCE ON HOT SHEET METAL FORMING OF HIGH-PERFORMANCE STEEL

REGISTER ONLINE AT AIST.ORG

31 May–4 June 2015 – Sheraton Centre Toronto – Toronto, Ont., Canada

AIST

GALVATECH

CO-ORGANIZED BY MET SOC

CHS²

GALVATECH 2015 SCHEDULE OF EVENTS

Sunday, 31 May 2015

16:00–18:00	Registration
17:00–18:30	Welcome Reception and Exposition

Monday, 1 June 2015

07:30–17:00	Registration
08:00–10:00	Galvatech Opening Ceremony and Lectures
08:30–17:00	Exposition
10:00–17:00	Poster Session
10:00–10:20	Refreshment Break
10:20–12:00	Technical Sessions
12:00–13:20	Lunch
13:20–15:00	Technical Sessions
15:00–15:20	Refreshment Break
15:20–17:00	Technical Sessions
18:00–21:00	Banquet at the Hockey Hall of Fame

Tuesday, 2 June 2015

07:30–17:00	Registration
08:00–17:00	Poster Session
08:20–10:00	Technical Sessions
08:30–17:00	Exposition
10:00–10:20	Refreshment Break
10:20–12:00	Technical Sessions
12:00–13:20	Lunch
13:20–15:00	Technical Sessions
15:00–15:20	Refreshment Break
15:20–17:00	Technical Sessions

Wednesday, 3 June 2015

07:30–12:00	Registration
08:00–15:00	Poster Session
08:20–10:00	Technical Sessions
08:30–13:00	Exposition
10:00–10:20	Refreshment Break
10:20–12:00	Technical Sessions
12:00–13:20	Lunch
13:20–15:00	Technical Sessions

Thursday, 4 June 2015

07:30–12:00	Plant Tours: ArcelorMittal Dofasco Inc. and U. S. Steel Canada — Hamilton Works **SOLD OUT**

The schedule of events is subject to change without notice.

GALVATECH AND CHS² REGISTRATION PRICING

AIST Member: US$1,250

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31 MAY–4 JUNE 2015

SHERATON CENTRE TORONTO

TORONTO, ONT., CANADA

CHS² 2015 SCHEDULE OF EVENTS

Sunday, 31 May 2015

16:00–18:00	Registration
17:00–18:30	Welcome Reception and Exposition

Monday, 1 June 2015

07:30–17:00	Registration
08:00–09:00	Welcome Speech and CHS² Opening Session
08:30–17:00	Exposition
09:00–10:00	Technical Sessions
10:00–10:40	Refreshment Break
10:40–12:00	Technical Sessions
12:00–13:20	Lunch
13:20–15:20	Technical Sessions
15:20–15:40	Refreshment Break
15:40–17:00	Technical Sessions
18:00–21:00	Banquet at the Hockey Hall of Fame

Tuesday, 2 June 2015

07:30–17:00	Registration
08:30–17:00	Exposition
08:50–10:10	Technical Sessions
10:10–11:00	Refreshment Break
11:00–12:00	Technical Sessions
12:00–13:20	Lunch
13:20–15:20	Technical Sessions
15:20–16:00	Refreshment Break
15:40–17:00	Technical Sessions
18:00–21:00	CHS² Banquet

Wednesday, 3 June 2015

07:30–12:00	Registration
08:30–13:00	Exposition
08:50–10:10	Technical Sessions
10:10–11:00	Refreshment Break
11:00–12:00	Technical Sessions
12:00	Closing Session

Thursday, 4 June 2015

08:00–12:00	Plant Tours: ArcelorMittal Dofasco Inc. and U. S. Steel Canada — Hamilton Works **SOLD OUT**

The schedule of events is subject to change without notice.

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The 10th International Conference on Zinc and Zinc Alloy Coated Steel Sheet **(Galvatech)** and 5th International Conference on Hot Sheet Metal Forming of High-Performance Steel **(CHS²)** will co-locate in Toronto, giving exhibitors a unique opportunity to reach a targeted audience.

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- Standard booth size is 10' x 10' (3.05 m x 3.05 m).
- US$32 per square foot, or US$3,200 for a 10' x 10' booth.

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- Siderails.
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- One complimentary AIST membership for 2015.

ASSIGNMENTS

Booth assignments will be based on a first-come, first-served basis.

RESERVATION AND PAYMENT INFORMATION

To confirm a booth reservation, please complete the online booth contract at AIST.org. Once the contract has been received, you will receive a confirmation with the booth location.

SHERATON CENTRE TORONTO

Available Booths

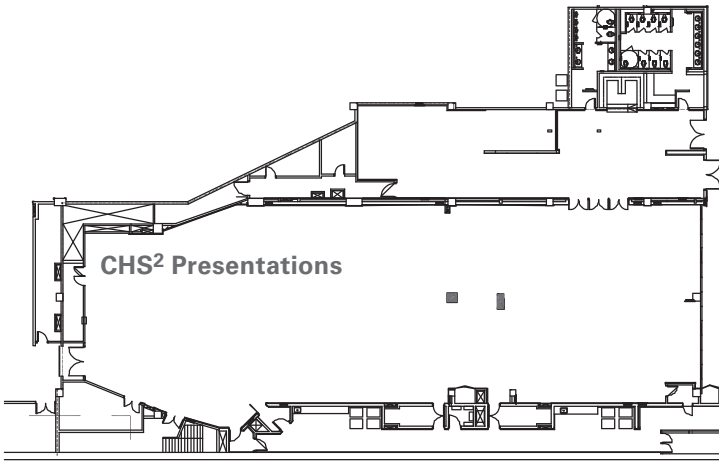
Reserved Booths

Set Up

Sunday, 31 May: 10 a.m.–5 p.m.

Tear Down

Wednesday, 3 June: 1–5 p.m.



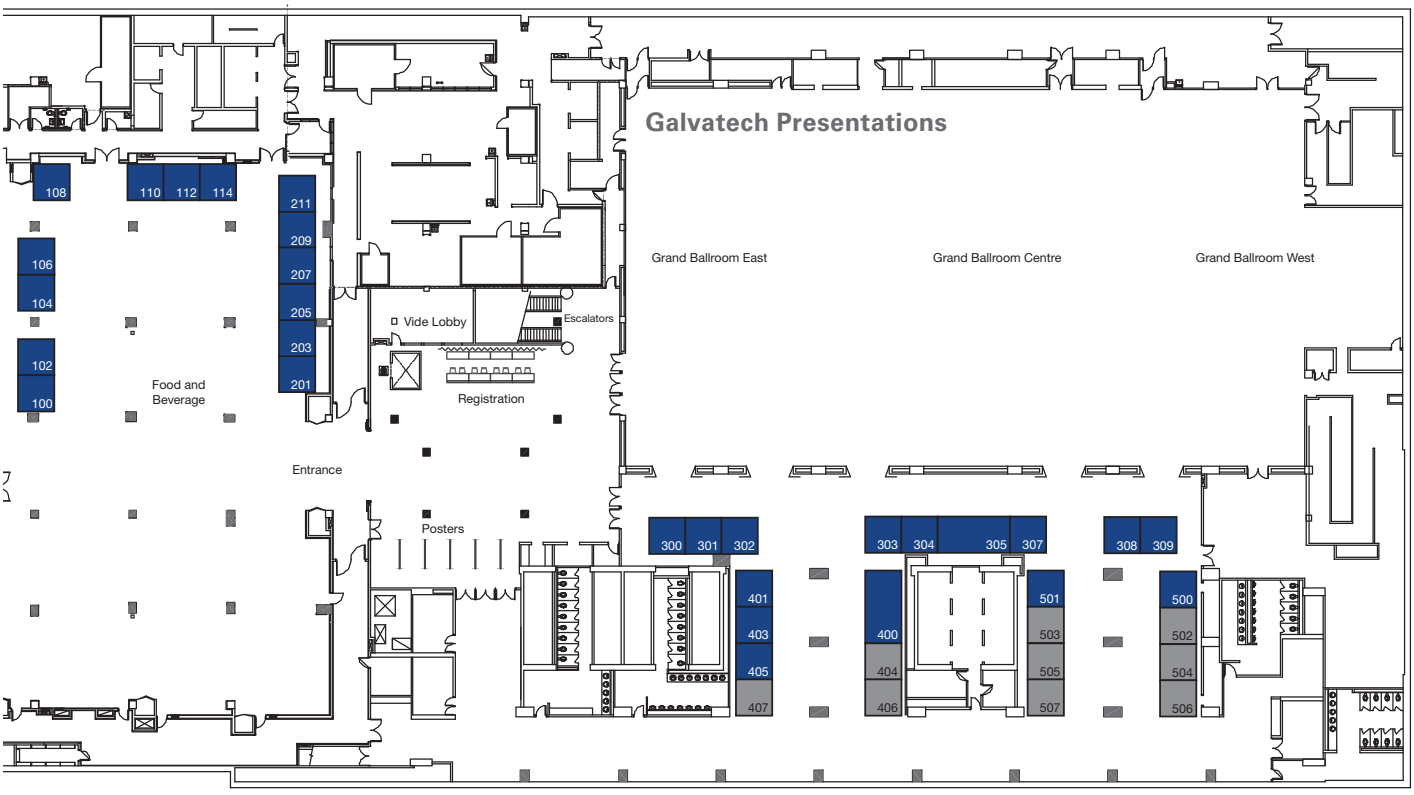
31 MAY–4 JUNE 2015

SHERATON CENTRE TORONTO

TORONTO, ONT., CANADA

CURRENT EXHIBITORS

- AICHELIN Holding GmbH . . . . . Booth #106
- Ajax TOCCO . . . . . Booth #400
- AP&T . . . . . Booth #108
- AutoForm Engineering USA Inc. . . . . Booth #211
- Bekaert Solaronics . . . . . Booth #304
- CMI Industry Americas Inc. . . . . Booth #301
- DE-STA-CO . . . . . Booth #100
- Ebner Furnaces Inc. . . . . Booth #112
- Fives . . . . . Booth #305
- Heraeus Electro-Nite Co. LLC. . . . . Booth #309
- INDUGA Industrieofen und Giesserei-Anlagen . . . . . Booth #300
- Joh. Clouth Maschinenbau Eltmann GmbH. . . . . Booth #405
- Lindberg/MPH . . . . . Booth #307
- Macrodyne Technologies Inc. . . . . Booth #110
- Praxair Surface Technologies Inc. . . . . Booth #303
- Quaker Chemical . . . . . Booth #114
- QuinLogic LLC . . . . . Booth #201
- RotaDyne . . . . . Booth #209
- Samwooeco Ltd. . . . . Booth #302
- Sarclad NA . . . . . Booth #401
- Schuler Inc.. . . . . Booth #501
- Schwartz GmbH Treatment Systems . . . . . Booth #203
- SMS Technical Services LLC . . . . . Booth #500
- Spraying Systems Co.. . . . . Booth #207
- Strothmann Machines and Handling GmbH . . . . . Booth #102
- Taylor-Winfield Technologies. . . . . Booth #104
- TECNAR . . . . . Booth #205
- Thermo Fisher Scientific. . . . . Booth #308
- WS Thermal Process Technology Inc. . . . . Booth #403



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The Making, Shaping and Treating of Steel®, 11th edition, Flat Products Volume outlines the progress made during the last 25 years in the major areas of scientific and technical know-how required for production of high-quality flat products. The *Flat Products Volume* is a compilation of international knowledge in four major areas:

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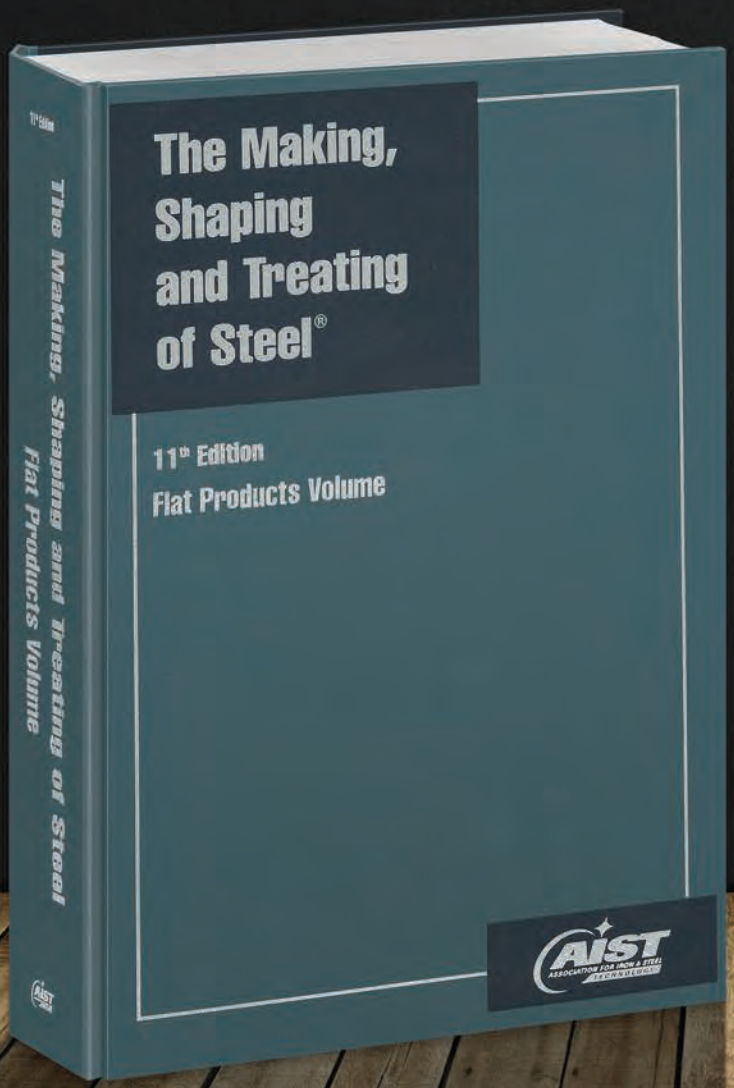
- Designs and performance characteristics of various plants producing flat products and descriptions of the plants' principal components.
- Automation and process control equipment providing desired characteristics of geometrical, mechanical and metallurgical parameters of produced flat products.



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31 MAY–4 JUNE 2015 | TORONTO, ONT., CANADA

CONFERENCE PROGRAM

SUNDAY, 31 MAY 2015

17:00–18:30
Welcome Reception *Main Exhibit Area*
Poster Session *Main Exhibit Area*

MONDAY, 1 JUNE 2015

07:00–07:45
Author Breakfast

08:00–08:20
Galvatech Opening Ceremony *Grand Ballroom East*

Welcome Addresses
F.E. Goodwin, International Zinc Association; J.R. McDermid, McMaster University; P. Badgley, U. S. Steel Canada; and I. O'Reilly, ArcelorMittal Dofasco Inc.

08:20–10:00
Galvatech Plenary Lectures *Grand Ballroom East*
Session Chairs: *Peter Badgley, U. S. Steel Canada; Ian O'Reilly, ArcelorMittal Dofasco Inc.*

Recent Progress and Development of the Zn and Zinc-Alloy Coatings in China
W. Li, Baoshan Iron and Steel Co.

General View on Korean Zinc- and Zinc-Alloy-Coated Steel Sheet
S. Park, POSCO

Expectation for Steel Sheet in View of Future Automotive Application
M. Mori, Toyota Motor Corp.

Galvanized in Europe — An Actual Status and Challenges for the Future
G. Angeli, J. Faderl, voestalpine Stahl GmbH

North American Zinc-Based Sheet Steel Coatings Technology: Production and Product Performance Update and Challenges
F.E. Goodwin, International Zinc Association; E. Silva, U. S. Steel Research and Technology Center

10:00–17:00
Poster Session *Main Exhibit Area*

10:00–10:20
Refreshment Break

10:20–12:00 | **New Lines**
Grand Ballroom East
Session Chair: *Stavros Fountoulakis, ArcelorMittal Global R&D*

Automotive Steel and Galvanizing Line Process Evolution: A Review (Keynote)
X, Cluzel, Fives DMS; E. Buscarlet, J-P. Nauzin, Fives Keods; S. Mehrain, Fives Stein

Hot-Dip Galvanizing Line at Arvedi Producing AHSS Over 800 MPa
M. Turchetto, Danieli Wean United; K. Kahoul, Danieli Centro Combustion

Economical Hot Strip Galvanizing
M. Cottin, M. Jaenecke, H-G. Klöckner, C. Sasse, SMS Siemag AG

Proactive Production Supervision and Control
F. Luecking, QuinLogic GmbH

Fives Stein Virtuo®, Enhanced Customer-Oriented Furnace Level 2 for Galvanizing Lines
T. Robin, C. Ammarcha, S. Mehrain, Fives Stein

10:20–12:00 | **Automotive Applications I**
Grand Ballroom Center
Session Chair: *Jong-Sang Kim, POSCO*

Experience of ArcelorMittal Dofasco in Automotive Exposed GI and GA Production (Keynote)
W. Zhong, T. Le, I. O'Reilly, B. Nelson, ArcelorMittal Dofasco Inc.

Zn-Mg-Al Hot-Dip Galvanized Coatings for Exposed Parts in the Automotive Industry
J. Schulz, F. Vennemann, G. Nothacker, ThyssenKrupp Steel Europe AG

Investigation of "High Spots" Defect in Galvannealed Automotive Outer Panels
R. Pais, S. Agnihotri, S. Roy, M. Kadarbhai, P. Narang, Tata Steel Ltd. India

Galvanizing of a Hot Rolled Steel With a Tensile Strength of 780 MPa for Stretch Flanging Applications
E. Bellhouse, J. Gao, ArcelorMittal Global R&D Hamilton

Development of Hot-Dip Galvannealed Steel Sheet for Automobile Outer Panel
P. Yang, Y. Zhang, Y. Chen, Wuhan Iron and Steel Corp.

10:20–12:00 | AHSS Galvannealed

Grand Ballroom West
Session Chair: *Li Wang, Baosteel*

Formation of Fe-Zn Intermetallic Phases in Galvannealed Mn-Si TRIP Steels
K-K. Wang, G-L. You, L. Chang, D. Gan, National Sun Yat-Sen University; L-J. Chiang, China Steel Corp.

Effect of the Atmosphere Dewpoint of Continuous Annealing Furnaces on the Quality of GA Coating on Dual-Phase Steel
J. Porto Guimarães, A.H. de Almeida Barbosa, Usiminas; B. Mendonça Gonzalez, Universidade Federal de Minas Gerais; R. Rodrigues Vieira, Unigal Usiminas

12:00–13:20
Lunch *Main Exhibit Area*

13:20–15:00 | Process Technology — Furnaces

Grand Ballroom East
Session Chair: *Michel Renard, Drever International S.A.*

Energy Efficiency Improvements in Processing Lines (Keynote)
M. Renard, J-P. Crutzen, J-M. Raick, Drever International S.A.; W. Song, B.Z. Ma, Y. Wang, Shougang Cold Rolling Mill

A Mathematical Model of a Combined Direct- and Indirect-Fired Strip Annealing Furnace
M. Niederer, S. Strommer, A. Steinboeck, A. Kugi, Vienna University of Technology, Automation and Control Institute; M. Fein, M. Boeck-Schnepps, Andritz AG; G. Helekal, voestalpine Stahl GmbH

Increased Si Content in AHSS Impacts Furnace Roll Coating Selection
W. Jarosinski, M. Helminiak, Praxair Surface Technologies Inc.

Radiant Tube Life Improvement for Vertical Galvanizing Lines
J. Wuenning, WS GmbH; H. Pfeifer, M. Hellenkamp, N. Schmitz, RWTH Aachen University; E. Cresci, WS GmbH; M. Schoenfelder, WS Inc.

13:20–15:00 | Automotive Applications II

Grand Ballroom Center
Session Chair: *Ari Peltola, SSAB Europe*

High-Strength Dual-Phase Steel With High Sheared Edge Ductility
A. DeArdo, Y. Gong, M. Hua, University of Pittsburgh

Continuous Hot-Dip Galvanizing of a Third-Generation (3G) Advanced Steel
K. Ranganathan, J.R. McDermid, McMaster University; F.E. Goodwin, International Zinc Association

Importance of Si/Mn Ratio on Galvanizability of Next-Generation Advanced High-Strength Steels
A. Chakraborty, M. Zuiderwijk, D. Hanlon, R&D, Tata Steel

Galvanizing-Related Surface Properties of Mn-Alloyed Third-Generation AHSS
L. Cho, J. Han Oh, E. Jung Seo, B.C. De Cooman, GIFT, Pohang University of Science and Technology (POSTECH)

Unique Technology for Production of New AHSS and UHSS Grades by Using the Zinc Bath as a Quenching Medium
P. Sippola, R. Patil, GSI Technology Inc.

13:20–15:00 | Zn-Based Coatings for Press Hardened Steels — I*

Grand Ballroom West
Session Chair: *Joseph R. McDermid, McMaster University*

Corrosion Protection of Galvanized Press-Hardening Steel: Main Influencing Factors and Mechanisms (Keynote)
G. Luckeneder, R. Autengruber, K-H. Stellnberger, J. Faderl, T. Kurz, voestalpine Stahl GmbH

The High-Temperature Oxidation Behavior and Alloying of Hot-Dip Zn-Al Coating
C-H. Wang, T-H. Shen, C-S. Lin, National Taiwan University

High-Pressure Transformation of Fe-Zn Intermetallics at Room Temperature
R. Ueda, K. Tanaka, Shogo Miyoshi, Y. Shibuta, The University of Tokyo; J. Nakano, National Energy Technology, URS Corp.; S. Yamaguchi, The University of Tokyo

XRD-Measurements of Coating Formation of Hot-Dip Galvanized Steel During Press-Hardening
T. Mörtlbauer, voestalpine Stahl GmbH

Zinc Diffusion and α-Layer Growth During Annealing of Zinc Coated 22MnB$_5$
V. Janik, WMG, University of Warwick; Y. Lan, Tata Steel, Swinden Technology Centre; G. Hensen, P. Beentjes, Tata Steel Technology B.V., IJmuiden Technology Center; D. Norman, Tata Steel Automotive Engineering Group; S. Sridhar, WMG

15:00–15:20
Afternoon Refreshment Break *Main Exhibit Area*

*Joint with CHS^2

15:20–17:00 | **Process Technology — Quality Control**

Grand Ballroom East
Session Chair: *Thomas Koll, Salzgitter Mannesmann Forschung GmbH*

On-Line Quality Monitoring of IF and High-Strength Steel on Continuous Galvanizing Lines Controlled by Furnace Mathematical Model
A. Lhoest, Drever International S.A.; M. Bärwald, EMG Automation GmbH; U. Sommers, M. Bigliari, SMS Siemag AG; E. Montagna, Tata Steel SEGAL S.A.; W. Beugeling, Tata Steel IJmuiden BV

Application of Automatic Surface Inspection System in Automotive Sheet Production
J. He, Baosteel

Formation of GA Streaky Defects Simulated by Lab Hot-Dip Simulator
W. Zhong, R. Dziuba, ArcelorMittal

Effect of the Dimension of a Spot and Line-Type Surface Imperfection on Its Visibility After Automotive Painting
X. Cheng, S. Snopek, D. Pineau, ArcelorMittal Global R&D Hamilton

Non-Contact On-Line Fluid Film Measurement System for Improved Quality Assurance
E. Almquist, Star Tool and Die Works; K-H. Fröhning, Kienzle Prozessanalytik GmbH

15:20–17:00 | **Automobile Forming/Welding**

Grand Ballroom Center
Session Chair: *Sakae Fujita, JFE Techno-Research Corp.*

The Effect of Al Content in the Coating on the Flaking Resistance of GA IF Steels (Keynote)
C. Cheng, V. Krishnardula, H. Hahn, ArcelorMittal USA

Frictional Behavior of Galvannealed Steel Sheet Depending on Tool Material
K. Hoshino, Y. Yamasaki, JFE Steel Corp.; W. Tanimoto, JFE Techno-Research Corp.; M. Nagoshi, S. Taira, N. Yoshimi, JFE Steel Corp.

Evaluation of the Surface Characteristics Influence on the Coating Properties
A.P. Domingos Cardoso, F.B. de Souza, F.C. de Oliveira, ArcelorMittal Vega

The Modeling Scheme to Investigate the Influence of Galvanneal Coating on Fracture Properties of AHSS Steels
N. Vajragupta, S. Münstermann, W. Bleck, RWTH Aachen University; F.E. Goodwin, International Zinc Association

15:20–17:00 | **Zn-Based Coatings for Press-Hardened Steels — II***

Grand Ballroom West
Session Chair: *Paul Janavicius, AK Steel Corp.*

Coil Applied Coating for Press-Hardening Steel
W. Fristad, Henkel Corp.

Advantages and Line Features of Using Linear Transfer Systems in a Full Automatic Hot Forming Press Line
C. Fais, Strothmann Machines and Handling GmbH

18:00
Banquet Dinner at the Hockey Hall of Fame

TUESDAY, 2 JUNE 2015

07:30–08:15
Author Breakfast

08:20–17:00
Poster Session *Main Exhibit Area*

08:20–10:00 | **Process Technology — Pre/Post-Treatment**

Grand Ballroom East
Session Chair: *Weimin Zhong, ArcelorMittal Dofasco Global R&D*

Fundamental Facts of Non-Woven Rolls for Continuous Galvanizing Lines
E. Almquist, Star Tool and Die Works

Development of Sarclad Carbide Deposition Texturing (CDT) as a Method for Increasing Campaign Length of Temper Mill Work Rolls
C. Childs, Sarclad Ltd.

Evolution of CMI Force-Torque Model to Predict the Skinpass Rolling Forces on AHSS
M. Morel, F. Dumortier; M. Dubois, CMI Metals

On Optimizing the Zinc Coating Surface by an Improved Temper Rolling Process
T. Koll, M. Bretschneider, T. Klinkberg, F. Luther, B. Maas, Salzgitter Mannesmann Forschung GmbH

Effects of Postex Texturing Parameters on the Surface Morphologies and Roughness Changes of Galvanized Steel Sheets
D-J. Paik, H-S. Han, J-S. Park, S-H. Jeon, D-G. Kang, S-Y. Choun, M-H. Hong, POSCO

**Joint with CHS²*

08:20–10:00 | Construction/Appliance

Grand Ballroom Center
Session Chair: *Laurens Witjens, Tata Steel R&D*

Interest of New Generation Zn-Al-Mg Coatings for the Industry and Construction Market
M. Monnoyer, B. Corlu, T. Machado Amorim, L. Dosdat, C. Dieu, ArcelorMittal Global R&D

Pre-Painted With Enhanced Performance in High-Corrosion Environments
F. Actis, J.P. Pedraza, Ternium Siderar; Z. Monica, B. Sonia, Tenaris Siderca; E. Di Libero, Ternium Siderar; A. Lazzarino, Instituto Argentino de Siderurgia

Development of Mg-Containing 55%Al-Zn Coated Steel for Building Applications
Q. Liu, D. Nolan, B. Shedden, R. Smith, J. Williams, A.K. Neufeld, BlueScope Ltd.

Development of Multi-Functional Chromate-Free Coated Steel Sheets for Electrical Appliances
K. Tsuchimoto, T. Matsuda, A. Matsuzaki, N. Yoshimi, JFE Steel Corp.

08:20–10:00 | AHSS Galvanizing I

Grand Ballroom West
Session Chair: *Michel Dubois, CMI Industry*

Pre-Oxidation of Advanced High-Strength Steels: Influence of Temperature, Reaction Time and Oxygen Concentration on Oxide Thicknesses (Keynote)
T. Wuttke, M. Norden, M. Blumenau, ThyssenKrupp Steel Europe AG

Oxidation-Reduction Behavior of Si-Added Steel Sheet
T. Minowa, H. Irie, K. Araga, Kobe Steel Ltd.

Analysis and Elimination of Oxide Defect Formation on GI Exposed Outer Body Automotive Panels During Continuous Hot-Dip Galvanizing
L. Berry, Swansea University/Tata Steel; C. Phillips, Tata Steel; D. Penney, Swansea University

Liquid Oxide Annealing for Surface Preparation of HSS
L. Bordignon, M. Larnicol, X. Vanden Eynde, P. Grekens, J-F. Noville, J. Smal, A. Farinha, CRM Group

Diffusion of Zinc and Magnesium Physical Vapor Deposited Thin Films at 175°C
E. Zoestbergen, J. van de Langkruis, T. Maalman, E. Batyrev, S. Melser, Tata Steel; M. Zuijderwijk, Tata Steel R&D

10:00–10:20
Coffee Break *Main Exhibit Area*

10:20–12:00 | Process Technology — Galvanizing Bath — Flow Models

Grand Ballroom East
Session Chair: *Daniel Liu, Tech Metals Ltd.*

Numerical Analysis of the Modification of Flow Using a Pumping System in the Gavanizing Bath (Keynote)
F. Ilinca, National Research Council of Canada; F. Ajersch, École Polytechnique; F.E. Goodwin, International Zinc Association

Simulation of Physical Phenomena Inside a Molten Zinc Bath by Using Computational Fluid Dynamic Methods
M. Mataln, C. Pfeiler, Materials Center Leoben Forschung GmbH; J. Strutzenberger, G. Angeli, voestalpine Stahl GmbH

CFD Studies of Dross Particle Tracking in a Galvanizing Bath
A.K. Neghab, A.N. Hrymak, Western University; F.E. Goodwin, International Zinc Association

Numerical Simulation of Fluid Flow and Heat Transfer in a Coreless Pot
Y. Xu, Shanghai Meishan Iron and Steel Co. Ltd.; J. Zhang, Q. Yue, Anhui University of Technology

Effect of Zinc Pot Designs on Flow and Temperature Distribution
G. Jiang, L. Liu, H. Teng, Shougang Research Institute of Technology; F. Kong, Beijing Shougang Cold Rolled Sheet Co. Ltd.

10:20–12:00 | Zn-Al-Mg Corrosion Performance

Grand Ballroom Center
Session Chair: *Jennifer Schulz, ThyssenKrupp Steel Europe AG*

New Procedure for Mass Loss Corrosion Testing of Magnesium-Containing Coated Steel Products (Keynote)
B. Shedden, A. Waters, S. Ford, BlueScope; N. Shimoda, Nippon Steel & Sumitomo Metal Corp.

Corrosion Resistance of Mg-Added 55%Al-Zn-1.6%Si Coated Steel Sheets
N. Shimoda, Y. Morimoto, Y. Kubo, Nippon Steel & Sumitomo Metal Corp.; N. Shiragaki, S. Fujii, Nippon Steel & Sumikin Coated Sheet Corp.

Cut Edge Corrosion Behavior of Zn-11%Al-3%Mg-0.2%Si Coated Steel
Y. Suzuki, S. Yamaguchi, M. Matsumoto, Nippon Steel & Sumitomo Metal Corp.; I. Muto, Tohoku University

Alloying of Zn-Al-Mg Coatings for Corrosion Stability Improvement
T. Prosek, French Corrosion Institute; F.E. Goodwin, International Zinc Association; D. Thierry, French Corrosion Institute

Development of Mg-Added 55%Al-1.6%Si-Zn Coated Steel Sheets
S. Fujii, Nippon Steel & Sumikin Coated Sheet Corp.; N. Shimoda, Nippon Steel & Sumitomo Metal Corp.

10:20–12:00 | AHSS Galvanizing II

Grand Ballroom West
Session Chair: *Eduardo Silva, U. S. Steel Research and Technology Center*

Evolution and Measurement of Iron Oxide Growth During HDG Annealing Conditions and the Impact on Galvanizing Behavior of AHSS (Keynote)
P. Kuhn, T. Wuttke, ThyssenKrupp Steel Europe AG; L. Bordignon, Albart, G. Monfort, Centre de Recherches Métallurgiques; A. Jarosik, R. Sagl, voestalpine Stahl GmbH; A. Vogel, S. Merzlikin, M. Rohwerder, Max-Planck Institut für Eisenforschung; W. Melfo, P. Bolt, Tata Steel Europe

Effect of Annealing Conditions on Galvanizing Behavior of Extra-Advanced High-Strength Steels
K. Kang, M-S. Kim, J-S. Kim, POSCO

Research and Development of the Cold Rolled Hot-Dip Galvanizing DP590 Steel With Low Cost
Y. Han, Shougang Research Institute of Technology

Simple Models for the Spreading of a Liquid Metal Droplet on a Solid Substrate
M-L. Giorgi, École Centrale Paris; A. Koltsov, J-M. Mataigne, ArcelorMittal Research Global R&D

12:00–13:20
Lunch *Main Exhibit Area*

13:20–15:00 | Process Technology — Galvanizing Bath — Management

Grand Ballroom East
Session Chair: *Louis Bordignon, CRM Group*

Experimental Validation of Computer Simulation of Aluminum Pickup and Iron Dissolution in Galvanneal and Galvanize Production (Keynote)
Y. Liu, Teck Metals Ltd.

Lab Free Pot Chemistry Monitoring: Libs Brought to the Next Level
A. Nadeau, Tecnar Automation Ltée

Influence of Initial Iron Content in Zinc Bath on the Dissolution Rate of Iron From Steel Sheet During Hot-Dip Galvanizing Process
S.M. Lee, Hanyang University; S.K. Lee, D.J. Paik, M.H. Hong, POSCO; J.H. Park, Hanyang University

Experimental Study of Skimmings Generation in Gavanizing Baths With Variable Al and Mg Compositions
F. Ajersch, École Polytechnique; F. Ilinca, National Research Council of Canada; F.E. Goodwin, International Zinc Association

Formation Behavior of Dross Particles in Hot-Dip Galvanizing Bath
J.H. Park, Hanyang University; D.J. Paik, M.H. Hong, POSCO

13:20–15:00 | Zn-Al-Mg Microstructure/Properties

Grand Ballroom Center
Session Chair: *Omar Garcia-Rincon, Ternium Mexico S.A. de C.V.*

Morphology of 55%Al-Zn Coating With Mg Addition
J.X. Li, D.M. Hreso, United States Steel Corporation

Investigation on the Characteristics of Hot-Dip Zn-3%Mg-2.5%Al Alloy Coated Steel Sheets
M-S. Oh, J.S. Kim, POSCO Technical Research Laboratories

Ion Permeability of the Artificially Synthesized Zinc Corrosion Products and Magnesium Corrosion Products
M. Saito, T. Takahashi, K. Ishizuka, Nippon Steel & Sumitomo Metal Corp.

Characterization of the Fe-Al Intermetallic Phases Formed in Hot-Dip Al-Zn-Mg Coatings
C-W. Hsu, G-L. You, National Sun Yat-Sen University; K-K. Wang, Metal Industries Research and Development Centre; L. Chang, D. Gan, National Sun Yat-Sen University; L-J. Chiang, China Steel Corp.

Research on Microstructure and Corrosion Behavior of Zinc-Magnesium Alloys Coating by Vacuum Evaporation
Q. Liu, Central Iron and Steel Research Institute; Q-F. Zhang, National Engineering Lab of Advanced Coating Technology for Metals

13:20–15:00 | Inhibition Layer Development and Breakdown

Grand Ballroom West
Session Chair: *Naoto Yoshimi, JFE Steel Corp.*

Mechanisms and Kinetics of the Inhibition Layer Breakdown in the Case of Ti IF Steel Grades Galvanized in GA Baths (Keynote)
D. Zapico Álvarez, F. Bertrand, J-M. Mataigne, ArcelorMittal Global R&D — Maizières Automotive Products; M-L. Giorgi, École Centrale Paris — Laboratoire de Génie des Procédés et Matériaux

Modeling of Interfacial Layer Growth Kinetics on Mn-Containing Steels During Continuous Hot-Dip Galvanizing
S. Alibeigi, ArcelorMittal Global R&D Hamilton; J.R. McDermid, McMaster University

Influence of Steel Chemistry and Bath Aluminum Content on the Integrity of the Inhibition Layer
V. Krishnardula, C. Cheng, ArcelorMittal USA Global R&D

Study of the Fe-Zn Phases Formation During the Galvannealing Treatment of Coatings With Different Aluminum Contents
S. Goulart-Santos, A. Barbosa, Usiminas

Estimation of the Fe-Zn Intermetallic Layer Thickness in Galvannealed Coating Through Electrochemical Route
A. Mondal, A. Chakraborty, A. Pathak, P. Mohanta, M. Dutta, Tata Steel R&D

15:00–15:20
Afternoon Refreshment Break *Main Exhibit Area*

15:20–17:00 | **Process Technology — Galvanizing Bath — Hardware**
Grand Ballroom East
Session Chair: *Daniel Yuen, BlueScope Steel*

Alloy Spike Growth Mechanism in 316L Pot Hardware in 55%Al-Zn Alloy Coating Bath
N. Setargew, W.Y.D. Yuen, BlueScope Ltd.

Development Efforts to Make REACH-Compliant Pot Roll Coating Solutions
M. Brennan, Praxair Surface Technologies Inc.

Pot Roll Rotation, A Challenge for High Line Speeds
M. Dubois, CMI Metals

Characterization of Bearings for Aluminizing Bath Hardware
M. Didier, P. Durighello, G. Ferrier, P. Dietsch, ArcelorMittal R&D

15:20–17:00 | **Corrosion Performance of Galvanized Sheet**
Grand Ballroom Center
Session Chair: *Matthew McCosby, U. S. Steel Research and Technology Center*

Assessment of Coil Coated Steel Materials After Long-Term Exposure in Different Natural Weathering Sites Worldwide (Keynote)
N. Lebozec, D. Thierry, French Corrosion Institute; T.X. Hang, Institute of Tropical Technology, VAST; P.T. San, Nhatrang Institute of Technology Research and Application, VAST

Corrosion Monitoring in Accelerated Corrosion Test and Exposure Test
M. Omoda, H. Harada, T. Kawano, H. Kajiyama, M. Kimura, JFE Steel Corp.

Five-Year Atmospheric Corrosion Test of Various Zn-Al Coatings in a Severe Marine Environment
N. Gao, D. Harrison, Y. Liu, Teck Metals Ltd.

Corrosion of Zinc and Zinc-Alloyed Coated Steel and Coil Coated Materials in Animal Building Environments
D. Thierry, N. Le Bozec, French Corrosion Institute

Accelerated Corrosion Study of Various Galvanized Coatings
A.M. Clifford, N. Gao, Y. Liu, Teck Metals Ltd.

15:20–17:00 | **Internal/External Oxidation Analysis**
Grand Ballroom West
Session Chair: *Gerhard Angeli, voestalpine Steel Division*

XPS and EELS Characterization of Mn_2SiO_4, $MnSiO_3$ and $MnAl_2O_4$ (Keynote)
A. Grosvenor, University of Saskatchewan; E. Bellhouse, ArcelorMittal Global R&D Hamilton; A. Korinek, The Canadian Centre for Electron Microscopy, Brockhouse Institute for Materials Research; J.R. McDermid, Steel Research Centre, McMaster University

Cross-Section Polishing: A Powerful Tool for Hot-Dip Galvanizing Process Optimization and Failure Analysis
G. Angeli, R. Sagl, A. Jarosik, J. Strutzenberger, T. Mörtlbauer, C. Riener, A. Schönauer, voestalpine Stahl GmbH

The Diffusible Hydrogen Management During the Annealing and Overaging Steps of Galvanized Dual-Phase Steels
C. Georges, X. Vanden Eynde, CRM Group; M. Dubois, CMI Industry

Solubility of Different Steel Grades in Zinc-Alloy Baths (Zn-Al-Mg vs. Zn-Al) Showing Different Iron Dissolution Kinetics/Mechanism in a Zn-Al-Mg Bath
C.K. Riener, A. Jarosik, G. Angeli, voestalpine Stahl GmbH

Analysis of a Spot Defect on an Industrial Hot-Dip Galvanized High-Silicon AHSS Sheet
W. Bi, X. Jin, Li Wang, Baosteel Research Institute

WEDNESDAY, 3 JUNE 2015

07:30–08:15
Author Breakfast

08:20–15:00
Poster Session *Main Exhibit Area*

08:20–10:00 | **Process Technology — Wiping — I**
Grand Ballroom East
Session Chair: *Man-Been Moon, Hyundai Steel – R&D Center*

Influence of the Nozzle Tip Angle on the Jet Wiping Ability
H. Takahashi, G. Takeda, JFE Steel Corp. Steel Research Laboratory

Tilted Wiping: Beneficial or Wrong Trail
M. Dubois, CMI Metals

Importance of the Zinc Film Modeling for Gas Jet Wiping Simulations
C. Pfeiler, M. Mataln, Materials Center Leoben Forschung GmbH; A. Kharicha, University of Leoben; C.K. Riener, G. Angeli, voestalpine Stahl GmbH

Parametric Study of Wall Shear Stress for Coating Weight Models in Continuous Hot-Dip Galvanizing
A. Ritcey, J.R. McDermid, S. Ziada, McMaster University

EMG-Vivaldi™: Industrial Proof of the New Paradigm for Strip Guiding in Furnace Atmospheres
M. Irle, EMG Automation GmbH; S. Devorich, EMG USA Inc.

08:20–10:00 | Corrosion Analysis Techniques

Grand Ballroom Center
Session Chair: *Frank E. Goodwin, International Zinc Association*

A Study on Electrochemical Impedance Spectroscopy of Galvannealed Phases (Keynote)
A. Chakraborty, A. Mondal, A. Pathak, A. Pandey, M. Dutta, Tata Steel R&D

Focus on XPS Investigations of Zn- and Zn-Alloy-Coated Steel Sheets: A Study on Induced Influences by This Analysis Technique for the Reliable Analysis of Industrial Samples
R. Steinberger, J. Duchoslav, T. Greunz, M. Arndt, CDL-MS-MACH, ZONA, JKU Linz; T. Steck, J. Faderl, G. Luckeneder, K-H. Stellnberger, voestalpine Stahl GmbH; D. Stifter, CDL-MS-MACH, ZONA, JKU Linz

Effect of Steel to Zinc Coating Thickness Ratio on Edge Creep of Coil Coated Materials
T. Prosek, A. Nazarov, D. Thierry, French Corrosion Institute

Comparative Studies of the Corrosion Behavior of Galvanized and Galvannealed Steel
B. Goo, W. Yang, M. Moon, Hyundai Steel Co.

Analysis of Passivation Film Whitening on Environment-Friendly Hot-Dip Galvanizing Steel Sheet
T. Guo, Pangang Group Research Institute Co. Ltd., C. Liu, Northeastern University

08:20–10:00 | Selective Oxidation of AHSS — I

Grand Ballroom West
Session Chair: *Georg Parma, ThyssenKrupp Steel Europe AG*

Effect of Internal Oxidation Layer Formed During Annealing Process on Selective Surface Oxidation Behavior and Galvanizability of Si, Mn Added Steels (Keynote)
Y. Suzuki, M. Miyata, N. Yoshimi, JFE Steel Co.

Effect of Cr on the Oxidation of Advanced High-Strength Steels During Annealing Prior to Galvanizing
W. Mao, V.A. Lashgari, Delft University of Technology; W. Melfo, Tata Steel Europe; W. Sloof, Delft University of Technology

Selective Oxidation of Fe-Si and Fe-Mn Binary Alloys
N. Ruscassier, J. Diawara, P. Haghi-Ashtiani, M-L. Giorgi, École Centrale Paris

Nanoscale Analysis of the Influence of Pre-Oxidation on the Oxide Formation and the Wetting Behavior of Second-Generation Advanced High-Strength Steel (AHSS) After Hot-Dip Galvanizing
T. Greunz, M. Arndt, J. Duchoslav, P. Kürnsteiner, R. Steinberger, CDL-MS-MACH, ZONA, JKU Linz; G. Hesser, ZONA, JKU Linz; C. Commenda, voestalpine Stahl GmbH; L. Samek, University of Applied Sciences Upper Austria, D. Stifter, CDL-MS-MACH, ZONA, JKU Linz

Influence of Dewpoint Shift During Heating on Selective Oxidation of Si-Containing Steels
H.Q. Wang, L.B. Liu, G.H. Liu, Shougang Research Institute of Technology

10:00–10:20
Coffee Break *Main Exhibit Area*

10:20–12:00 | Process Technology — Wiping — II

Grand Ballroom East
Session Chair: *Marianne Mataln, Materials Center Leoben Forschung GmbH*

Characterization of a New Air Knife Design for the McMaster University Galvanizing Simulator
S. Alibeigi, J.R. McDermid, J. Thomson, Steel Research Centre, McMaster University

Installation and Operating Experience With a Spooner After-Pot Strip Cooler and Stabilizer at DJ Galvanizing
P. Henderson, Spooner Industries Ltd.; James O'Dwyer, DJ Galvanizing Corp.

Ancillary Benefits of the High Performance of Danieli X-Jet
N. Kohler, Danieli Kohler

10:20–12:00 | New Conversion Coatings

Grand Ballroom Center
Session Chair: *Gabriel Cevellini, Ternium*

Corrosion and Fuel Resistance of Zn-Ni Electrodeposits With Different Ni Contents
M. Kwon, S.H. Cho, D-H. Jo, H.T. Kim, J-T. Park, Pohang Research Lab Steel Product Research Group 2, POSCO Technical Research Laboratories; J.M. Park, GIFT, Pohang University of Science and Technology (POSTECH)

The Development of New Inorganic Chromium-Free Chemical for Zinc Plating
E. Kudo, Y. Kinoshita, J. Uchida, Nihon Parkerizing Co. Ltd.

Mill Applied Surface Pretreatments: The New Paradigm
C. Gosselin, D. Kelley, TecCoat

The Development of an Inorganic-Organic Hybrid Coating System for Galvanized Steel Sheet
M. Endo, Y. Kinoshita, S. Yamamoto, T. Tokutome, Nihon Parkerizing Co. Ltd.

Study on an Environment-Friendly Self-Lubricating Passivation Solution of Galvanized Sheet
C. Ran, T. Guo, Q. Xu, PanGang Group Research Institute Co. Ltd., State Key Laboratory of Vanadium and Titanium Resources Comprehensive Utilization

10:20–12:00 | Selective Oxidation of AHSS — II

Grand Ballroom West
Session Chair: *Daniel Baker, GM Powertrain*

Influence of Carbon Content on Oxidation Behavior of Si-Containing Steel
M. Tanaka, Y. Suzuki, N. Yoshimi, JFE Steel Corp.

Selective Oxidation and Reactive Wetting of 6Mn-2Si and 2Mn-1.5Si Advanced High-Strength Steels
M. Pourmajidian, A. Rafiei, J.R. McDermid, McMaster University

Development of Prediction Model for Internal Oxidation of Al-Added DP Steel Using Phase Field Model
S. Kim, N. Goo, Hyundai Steel Co.

Influence of Sn on the Selective Oxidation and Reactive Wetting of CMnSi TRIP Steel During Hot-Dip Galvanizing
L. Cho, B.C. De Cooman, GIFT, Pohang University of Science and Technology (POSTECH)

Investigation on Selective Oxidation of Boron in BH Steel Sheet
X. Jin, L. Wang, H. Qian, J. Zheng, Baosteel

12:00–13:20

Lunch *Main Exhibit Area*

13:20–15:00 | Process Technology — Innovations

Grand Ballroom East
Session Chair: *Hideyuki Takahashi, JFE Steel Corp. Steel Research Laboratory*

Advanced Packing Technology for Coated Products Toward Value Addition and Cost Savings
M. Rissanen, Pesmel Oy; J. Rajagopalan, Pesmel North America

Reduction of the Specific Steam Consumption at JFE Fukuyama No. 3 CGL
Y. Abe, Y. Harai, N. Baba, K. Yoshida, T. Horisawa, Cold Rolling Department, JFE Steel Corp.

Practical Experiences With a Novel Non-Contact On-Line Surface Cleanliness Measurement System
E. Almquist, Star Tool and Die Works; U. Crossa, Tolket SRL

Improvement of Corrosion Resistance on Arc-Welded Areas of Automotive Chassis by Water Repellency Coating
W. Yang, Hyundai Steel R&D Center; S. Ahn, Hyundai Motor R&D Group; J. Han, KDK Automotive Coating; M. Moon, C. Lee, Hyundai Steel R&D Center

The Study of Optimized Thermal Treatment Condition of Polyvinylidene Fluoride (PVDF) on Aluminum Substrate as Pre-Coated Metal (PCM)
M-Y. Jeong, Y-S. Jeong, Y-H. Kim, M-B. Moon, Hyundai Steel Co.

13:20–15:00 | New Functional Coatings

Grand Ballroom Center
Session Chair: *Allen Rogers, Nucor Steel*

Analysis and Improvement of Rust Defect on Chromate Coated Galvanized Steel Sheet
C.K. Kuo, China Steel Corp. (Taiwan)

The Process Control of Phosphating Galvanized Plate With High Surface Quality
X. Gu, Y. Zhang, P. Yang, Wuhan Iron and Steel Co.

Comparison of New Thin Organic Coatings for Zinc-Coated Steel
K. Foster, Henkel Corp.

13:20–15:00 | Selective Oxidation of AHSS — III

Grand Ballroom West
Session Chair: *Kuniyasu Araga,Kobe Steel Ltd. – R&D Laboratory*

The Effect of Copper on the Oxidation Behavior of C-Si-Mn Steels Under Different Dewpoints
H. Teng, Shougang Research Institute of Technology, School of Material Science and Engineering, University of Science and Technology

The Study of the Steel Sheet on the Chipping Resistance in Low Temperature for Automotive Body
H-R. Kim, Y-S. Jeong, Y-H. Kim, M-B. Moon, Hyundai Steel Co.

Evaluation of Electrochemical Characteristics and Corrosion Performance of Arrowhead Defect on Zodiac GI Full Finish
L. Berry, Swansea University/Tata Steel; C. Phillips, Tata Steel; D. Penney, Swansea University

Vacurolls for Strip Drying After Skinpass Mill
B. Schaming, Spraying Systems Co.

Poster Session

The Study of Anti-Corrosion Properties of Free-Chromium Composite Coatings on Hot-Dip 55%Al-Zn Alloy-Coated Steel Sheet
Z. Xu, Z. Zheng, Q. Xu, Pangang Group Research Institute Co. Ltd.

Influence of Temperature of Continuous Annealing on the Microstructure and Mechanical Properties of Galvanized Dual-Phase Steel (DP980)
E.A. Moraes, Usiminas S.A.; D.B. Santos, UFMG — Federal University of Minas Gerais; R.O. Rocha, F.S. Costa, Usiminas S.A.

Inhibition Breakdown Kinetics of Dual-Phase Steels
A. Boulton, J.R. McDermid, McMaster University

Effect of Galvanizing Heat Treatment on the Microstructure and Mechanical Properties of a 6Mn-1.5Si Third-Generation Advanced High-Strength Steel
K.M. Haque Bhadhon, J.R. McDermid, McMaster University; F.E. Goodwin, International Zinc Association

Morphology and Texture of High-Speed Galvanized Coatings on Interstitial-Free Steel Sheet
Y. Zhang, P. Yang, X. Gu, Wuhan Iron and Steel Co.

Metallothermic Reduction of Manganese Oxides in the Continuous Galvanizing Baths
A. Rajabi, J.R. McDermid, McMaster University

Coating Thickness and Composition Control of Metal Layers on Steel by XRF
M. Longo, C. Tsuris, F. Casco, D. Kuiper, PANalytical B.V.

Effect of Continuous Annealing Parameters on Microstructure and Mechanical Properties of Hot-Dip Galvanized Steel of the 800-MPa Strength Class
G.W. Guimaraes, R.O. Rocha, Usiminas S.A; P.R. Cetlin, Federal University of Minas Gerais

Water-Based Chromate-Free Lubricating Film for Galvanized Steel Sheet
X. Liu, Q-F. Zhang, S-M. Jiang, G. Yu, China Iron & Steel Research Institute Group; National Engineering Lab of Advanced Coating Technology for Metals

Study on Stamping Properties of Galvalume® Coating
Z. Ding, Baosteel Iron and Steel Co. Ltd.

Effect of Continuous Annealing Parameters on Microstructure and Mechanical Properties of a Hot-Dip Galvanized Steel of the 800-MPa Strength Class
G.W. Guimaraes, R.O. Rocha, J.L. Ferreira, USIMINAS S.A; P.R. Cetlin, Federal University of Minas Gerais

Study on Microstructure Transformation of GI Coating During Heat Treatment
J. Zhang, Q-F. Zhang, S-M. Jiang, China Iron and Steel Research Institute Group

Effect of Nickel Addition on Intermetallic Layer Growth in the Aluminide 45 Steel During Hot Dipping
X. Chen, Y. Liu, X. Su, Changzhou University

Influence of Dewpoints on Galvannealing Properties of a Dual-Phase Steel
Y-P. Li, Q-F. Zhang, S-M. Jiang, China Iron and Steel Research Institute Group (CISRI); C-Y. Qi, H-X. Teng, Shougang Shunyi Cold Rolling Co. Ltd.; H-Q. Wang, Shougang Research Institute of Technology

SUNDAY, 31 MAY 2015

17:00–18:30
Welcome Reception *Main Exhibit Area*

MONDAY, 1 JUNE 2015

07:00–07:45
Author Breakfast

08:30
Opening Session *Osgoode Ballroom East*

Welcome Speech
Prof. Kurt Steinhoff, University of Kassel, Germany; Prof. Mats Oldenburg, Prof. Braham Prakash, Luleå University of Technology

08:40
Opening Speech *Osgoode Ballroom East*

Government Perspective
Directions in High-Strength Steel for Vehicle Lightweighting
William Joost, U.S. Department of Energy

08:50
Opening Speech *Osgoode Ballroom East*

Industry Perspective
Hot Stamping — 2015 and Beyond
Del Matharoo, Cosma International Group of Magna International Inc.

09:00–10:00 | **Tailored Properties I**
Osgoode Ballroom East
Session Chair: *Paul Belanger, General Motors*

Partial Tempering of Press-Hardened Steels by Direct Flame Impingement — The Review of an Alternative Approach for Tailored Properties
F. Zimmermann, J. Spörer, BMW AG; W. Volk, UTG – Technische Universität München

Laser Softening of Press-Hardened Steel in High-Volume Production
M. Schaefer, Trumpf Laser-und Systemtechnik GmbH; D. Schuoecker, J. Aichinger, Oberösterreichisches Laserzentrum e.V.; T. Harrer, Trumpf Laser-und Systemtechnik GmbH

Hot Forming and Subsequent Cooling Outside the Press for Adjusted Tailored Properties of 22MnB$_5$ Steel Sheets
B-A. Behrens, Institute of Forming Technology and Machines, Leibniz Universität Hannover; H.J. Maier, F. Nürnberger, Institute of Materials Science, Leibniz Universität Hannover; J. Schrödter, J. Moritz, Institute of Forming Technology and Machines, Leibniz Universität Hannover; L. Wolf, Institute of Materials Science, Leibniz Universität Hannover; C.M. Gaebel, Institute of Forming Technology and Machines, Leibniz Universität Hannover

09:00–10:00 | **Hydrogen Embrittlement**
Osgoode Ballroom West
Session Chair: *Daniel Casellas, CTM-Techological Centre, ESP*

Investigating the Interaction Between Hydrogen and Press-Hardened Materials
J. Weczera, Volkswagen AG, Group Research; M. Rhode, BAM Federal Institute for Materials Research and Testing; C. Sunderkötter, A. Plath, Volkswagen AG, Group Research; S. Jüttner, Institute of Materials and Joining Technology, Otto von Guericke Universität Magdeburg

Influence of Microstructures on Hydrogen Embrittlement Susceptibility of Hot Stamped Ultrahigh-Strength Components
T. Senuma, Y. Takemoto, Okayama University

Impact of Nb Microalloying on the Hydrogen Embrittlement of Press-Hardening Steel
J. Bian, Niobium Tech Asia; H. Mohrbacher, NiobelCon bvba; S. Zhang, College of Mechanical Engineering; H. Lu, W. Wang, CITIC Metal Co. Ltd.; Y. Zhang, L. Wang, University of Science and Technology Beijing

10:00–10:40
Refreshment Break *Main Exhibit Area*

10:40–12:00 | **Coatings I***
Osgoode Ballroom East
Session Chair: *Joseph Faderl, voestalpine Stahl GmbH*

Effects of Depth of Surface Crack on Fatigue Property in Zn-Ni Coated Press-Hardened Steel
K. Nakagawa, T. Nakagaito, T. Yokota, K. Seto, A. Yoshitake, JFE Steel Corp.

Unlocking the Potential of Zinc Coated Steel for Hot Forming by Innovative Process Modifications
G. Hensen, P. Beentjes, M. Abspoel, Tata Steel

Microstuctural Evolution of the 55 wt. % Al-Zn Coating During Press Hardening
C.W. Lee, GIFT, Pohang University of Science and Technology (POSTECH); Y.C. Cho, POSCO; B.C. De Cooman, GIFT, Pohang University of Science and Technology (POSTECH)

*Joint sessions with Galvatech

Characteristics of Crack Evolution in Al-Si Coating Under Different Deformation Conditions
K. Wang, P. Liu, Z. Wang, Y. Liu, B. Zhu, Y. Zhang, State Key Laboratory of Materials Processing and Die and Mould Technology, Huazhong University of Science & Technology

10:40–12:00 | **Tutorial** *(by invitation)*
Linden Room

PHS Process Monitoring — Skills & Methods for Young Professionals
Prof. Dr. Kurt Steinhoff University of Kassel

10:40–12:00 | **Tribology**
Osgoode Ballroom West
Session Chair: *Christian Conrad, Fraunhofer Institute for Nondestructive Testing*

Parameters Influencing Adhesive Wear Behavior Within Hot Stamping Operations
M. Wieland, M. Merklein, Institute of Manufacturing Technology, Friedrich-Alexander University of Erlangen-Nuremberg

Validation of Tool-Wear Simulations Based on Full-Scale Press-Hardening Tests
L. Deng, S. Mozgovoy, J. Hardell, B. Prakash, M. Oldenburg, Luleå University of Technology

Analysis of the Tribological Performances of New Tool Steels in Hot Stamping Applications
A. Ghiotti, S. Bruschi, F. Medea, University of Padua; A. Hamasaiid, Rovalma S.A.

Adhesion Behavior of Aluminum for Aluminum-Coated $22MnB_5$ Steel in Hot Stamping Under Dry and Lubricated Conditions
K. Uda, Research & Development Department, Daido Chemical Industry Co. Ltd.; A. Azushima, Graduate School of Engineering, Yokohama, National University

12:00–13:20
Lunch *Main Exhibit Area*

13:20–14:20 | **Modeling & Simulation**
Osgoode Ballroom East
Session Chair: *Martin Skrikerud, AP&T AB*

Microstructure-Based Modeling of Ductile Failure — Application to Components With Tailored Properties
R. Östlund, M. Oldenburg, Luleå University of Technology

Implementation of a Failure Criterion for Axial Crush of Fully Hardened Boron Steel
L.T. Kortenaar, K. Omer, A. Bardelcik, M. Worswick, University of Waterloo; D. Detwiler, S. Malcolm, Honda R&D Americas Inc. R. Soldaat, ArcelorMittal Dofasco Inc.

Simulative High-Temperature Friction and Wear Studies for Press-Hardening Applications
S. Mozgovoy, J. Hardell, L. Deng, M. Oldenburg, B. Prakash, Luleå University of Technology

13:20–14:20 | **Process Design I**
Osgoode Ballroom West
Session Chair: *Edward Schleichert, Magna Automotive Services GmbH*

Mechanical Link Servo Press for Improved Hot Forming Capability
T. Maki, Amino North America Corp.; M. Amino, Amino Corp.

Production Control and Optimization of Hot Stamping Line
L. Wang, Q. Wang, J. Meng, Y. Wang, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong, University of Science and Technology; X. Yao, Dongguan Hot-Stamping Technology Co. Ltd.; Y. Zhang, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong, University of Science and Technology

From First Draft to Serial Production: Hot Stamping Part Design and Feasibility Study With Respect to Functionality and Optimization of Production Costs
J. Aspacher, Schuler Pressen GmbH

14:20–15:20 | **Tailored Properties II**
Osgoode Ballroom East
Session Chair: *Michael Worswick, University of Waterloo*

Study on Fracture in Heat-Affected Zones in the Vicinity of Spot Welds in a Steel With Tailored Material Properties
S. Golling, R. Östlund, M. Oldenburg, Luleå University of Technology

Fracture Resistance of Tailor-Tempered Microstructures Obtained by Different Press-Hardening Conditions
D. Casellas, Fundació CTM Centre Tecnologic and Luleå University of Technology; A. Lara, Fundació CTM Centre Tecnologic; M. Oldenburg, Luleå University of Technology

Partial Hardening of New Press-Hardenable Steel Grades
T. Marten, H. Block, T. Tröster, University of Paderborn

14:20–15:20 | **Non-Destructive Testing, Joining and Formability**
Osgoode Ballroom West
Session Chair: *Daniel Maier, TRUMPF Laser-und Systemtechnik GmbH*

Non-Destructive Testing of Material Properties and Defects in Cold and Hot Stamped Parts
C. Conrad, B. Wolter, R. Kern, T. Lambert, A. Haas, T. Müller, F. Niese, M. Bastuck, Fraunhofer Institute for Non-Destructive Testing – IZFP

Magnet Pulse Welding — A Review on Joining of Aluminum and High-Performance Steel
A. Rebensdorf, S. Böhm, Institute for Production Technologies and Logistics, University of Kassel

Effect of Scale Thickness on Formability in Hot Stamping of Boron-Alloyed Steel
A. Yanagida, E. Komatsu, R. Ozaki, Tokyo Denki University; A. Azushima, Yokohama National University

15:20–15:40
Refreshment Break *Main Exhibit Area*

15:40–17:00 | **Product Properties**
Osgoode Ballroom East
Session Chair: *Luke Reini, General Motors*

Crevice Corrosion of Patch Reinforcements of Hot Stamping Steels
M. Jönsson, L. Levander, D. Berglund, Gestamp

Side-Impact Crash Behavior of Press-Hardened Steels — Correlation With Mechanical Properties
P. Larour, voestalpine Stahl GmbH; J. Naito, Kobe Steel Ltd. Mechanical Engineering Research Laboratory; A. Pichler, T. Kurz, voestalpine Stahl GmbH; T. Murakami, Kobe Steel Ltd. Material Research Laboratory

Multi-Axial Deformation Behavior of Hot Formed Structures at High Strain Rates
N. Weiß, T. Marten, H. Block, T. Tröster, University of Paderborn

Effect of Shot Peening on the Residual Stress of Hot Stamping Parts
R. Ge, H. Xue, S. Zhou, H. Wang, Research and Development Center, Wuhan Iron and Steel Corp.

15:40–17:00 | **Heating & Cooling I**
Osgoode Ballroom West
Session Chair: *Kurt Steinhoff, University of Kassel*

Experimental Measurements of the Dynamics of Austenitization and Evolution of the Al-Si Coating of 22MnB$_5$ Blanks Undergoing Rapid Heating
N. Chester, J. Leung, K. Daun, M. Wells, University of Waterloo

PACEFLAME — A Versatile Tool to Boost Efficiency in Hot Forming Processes
M. Bors, Linde AG

Stabilization of Hardness of Product in Hot Stamping Using Rapid Resistance Heating
T. Maeno, K-I. Mori, M. Sakagami, Y. Nakao, Toyohashi University of Technology

New Developments in Furnaces for Press Hardening
H. Lehmann, RWTH Aachen

18:00
Banquet Dinner at the Hockey Hall of Fame

TUESDAY, 2 JUNE 2015

08:50–10:10 | **Coatings II**
Osgoode Ballroom East
Session Chair: *Frank Goodwin, International Zinc Association*

Direct Hot Forming of Zinc Coated Press-Hardening Steel
T. Kurz, H. Schwinghammer, G. Luckeneder, T. Manzenreiter, voestalpine Stahl GmbH; A. Sommer, voestalpine Polynorm GmbH & Co. KG

Coating Evolution and Mechanical Behavior of Zn-Coated Press-Hardening Sheet Steel
Z. Ghanbari, J. Speer, K. Findley, Colorado School of Mines

Structural Change of Galvanannealed Coating During Hot Stamping Heating Process
A. Sengoku, Steel Research Laboratories, Nippon Steel & Sumitomo Metal Corp. Futtsu; H. Takebayashi, Nagoya R&D Laboratory, Nippon Steel & Sumitomo Metal Corp. Tokai

The Development of the Coated Hot Forming Steels at WISCO
Y. Bi, Wuhan Iron & Steel Group Corp., Advanced Materials R&D Center; R. Ge, G. Feng, F. Fang, K. Liu, S. Zhou, Wuhan Iron & Steel Group Corp., Research and Development Center

08:50–10:10 | **Tutorial** *(by invitation)*
Linden Room

Simulation Methods for Press-Hardening Applications
Prof. Dr. Mats Oldenburg, Luleå University of Technology

08:50–10:10 | **Press-Hardening Steel I**
Osgoode Ballroom West
Session Chair: *Pascal Drillet, ArcelorMittal*

Hot Forming of a Medium-Mn TRIP Steel
X. Jin, L. Wang, The State Key Laboratory of Automotive Steel Development and Application, Baoshan Iron and Steel Co. Ltd.; X. Xiong, J. Wang, China Science Lab, General Motors Global Research and Development; P. Belanger, Product Industrial Engineering, General Motors Global Product Integrity

Hot Forming Response of Medium-Mn Transformation-Induced Plasticity Steels
R. Rana, C.H. Carson, J. Speer, Advanced Steel Processing and Products Research Center, Department of Metallurgical and Materials Engineering, Colorado School of Mines

The Origin of Hematite Blades or 'Red-Oxide' on Bare Press-Hardening Steels
L. Garza-Martinez, R. Comstock, AK Steel Corp. – Middletown Works

Metallurgical Controlling Factors for the Ductility of Hot Stamped Parts
S. Otani, M. Kozuka, T. Murakami, J. Naito, Kobe Steel Ltd.; A. Pichler, T. Kurz, voestalpine Stahl GmbH

10:10–11:00
Refreshment Break *Main Exhibit Area*

11:00–12:00 | **Process Design II**
Osgoode Ballroom East
Session Chair: *Martin Jonsson, Gestamp HardTech AB*

Intelligent Process Control in Press Hardening
W-G. Drossel, N. Pierschel, Fraunhofer Institute for Machine Tools and Forming Technology; M. Alsmann, Volkswagen AG, Werk Kassel; J. Schönherr, S. Polster, U. Priber, F. Schieck, S. Berndt, Fraunhofer Institute for Machine Tools and Forming Technology

Deep-Drawing Technique With Temperature Distribution Control for Hot Stamping Process
E. Ota, Y. Yogo, N. Iwata, Toyota Central R&D Laboratories Inc.

Investigations on Aluminum Hot Forming in Comparison to Other Aluminum Forming Technologies and the Press Hardening of Steel
C. Koroschetz, M. Skrikerud, L-O. Jönsson, T. Andersson, AP&T AB

11:00–12:00 | **Modeling & Simulation II**
Osgoode Ballroom West
Session Chair: *Mats Oldenburg, Luleå University of Technology*

Artificial Neural Network (ANN)-Based Microstructure Modeling of 22MnB$_5$ Boron Steel During Tailored Quenching in Hot Stamping Process
P. Chokshi, D. Hughes, D. Norman, I. McGregor, R. Dashwood, University of Warwick

From Concept to Virtual Reality — Virtual Hot Forming Engineering Illustrated
H. Porzner, ESI Group; D. Lorenz, M. Holecek, M. Vrolijk, M. Hoss, B. Damenha, J. Friberg, C. Koroschetz, M. Skrikerud, AP&T

Developments of Experimental Platform and Finite Element Model for Hot Stamping Processes
C. Hung, National Chiao Tung University; T-Z. Hung, H-K. Tsai, F-K. Chen, National Taiwan University; P-K. Lee, Iron & Steel Research & Development Department, China Steel Corp.

12:00–13:20
Lunch *Main Exhibit Area*

13:20–14:20 | **Heating & Cooling II**
Osgoode Ballroom East
Session Chair: *Markus Lalla, Volkswagen AG*

Influence of Short Austenitization Treatments on the Mechanical Properties of Low-Alloy Boron Steel
M.J. Holzweißig, University of Paderborn, Materials Science; J. Lackmann, S. Konrad, C. Rüsing, Benteler Automotive, Research and Development; A. Andreiev, M. Schaper, University of Paderborn, Materials Science; T. Niendorf, Technische Universität Freiberg, Institute of Materials Science

Incomplete Austenitization of Patched Blanks in Hot Forming Die Quenching
K. Jhajj, K. Daun, University of Waterloo; S. Slezak, Formet Industries

Bake Hardening Analysis of 22MnB$_5$ PHS by the Impulse Internal Friction
W.S. Choi, B.C. De Cooman, GIFT, Pohang University of Science and Technology (POSTECH)

13:20–14:20 | **Tailored Properties III**
Osgoode Ballroom West
Session Chair: *John R. Speer, Colorado School of Mines*

Hot Formed Tailor-Rolled Products, Tailored Lightweight Design Solutions for the Vehicle Structure
J. Brecht, S. Pohl, B. Goeddeke, Mubea TRB

Development and Testing of an Axial Crush Member With Tailored Properties
K. Omer, A. Bardelcik, R. George, M. Worswick, University of Waterloo; D. Detwiler, S. Malcolm, Honda R&D Americas Inc.; N. Adam, Promatek Research Centre

Effects of Various Scenarios in Tailoring a Hot Stamping Part on the Side Impact Behavior
A. Abdollahpoor, Deakin University; X. Chen, Chinese Academy of Sciences; X. Chen, Hunan University; M.P. Pereira, Deakin University; N. Xiao, Chinese Academy of Sciences; B.F. Rolfe, Deakin University

14:20–15:20 | **Heating & Cooling III**
Osgoode Ballroom East
Session Chair: *Ignacio Martin, Gestamp BIW*

Effects of Heating Time on Transformation During Cooling of Boron Steel Sheets
K. Hikida, Nippon Steel & Sumitomo Metal Corp. Futtsu; N. Kojima, Nippon Steel & Sumitomo Metal Corp. Hirohata

Effect of High Cooling Rate on Shape Accuracy of Hot Stamped Parts
N. Nomura, Nippon Steel & Sumitomo Metal Corp. Amagasaki; H. Fukuchi, Nippon Steel & Sumitomo Metal Corp. Futtsu; A. Seto, Nippon Steel & Sumitomo Metal Corp. Amagasaki

Characterization of the Interface Heat Transfer Properties in the Hot Stamping Process
F-K. Chen, T-H. Hung, P-W. Tsai, C-K. Liu, National Taiwan University; T-B. Huang, St. John's University; P-K. Lee, Iron & Steel Research & Development Department, China Steel Corp.

14:20–15:20 | Tailored Properties IV
Osgoode Ballroom West
Session Chair: *Takehide Senuma, Okayama University*

Forming Tailored Material Properties Through Direct Contact Heating
J. Rasera, N. Field, N. Daun, University of Waterloo; M. D'Souza, F&P Manufacturing Inc.

A New Hot Stamping Process to Make Tailored Properties Based on Air Cooling
P. Liu, K. Wang, Z. Wang, L. Wang, B. Zhu, Y. Zhang, Y. Wang, State Key Laboratory of Materials Processing and Die and Mould Technology, Huazhong University of Science and Technology

Prediction of Thermal Softening of Hardened High-Strength Steel
Z. Wang, K. Wang, P. Liu, L. Wang, B. Zhu, Y. Zhang, Y. Wang, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong University of Science and Technology

15:20–16:00
Refreshment Break *Main Exhibit Area*

16:00–17:00 | Cutting and Trimming
Osgoode Ballroom East
Session Chair: *Stefan Böhm, University of Kassel*

Cost-Effective Trimming in Hot Stamping Through the Combination of Accurate Blank Development, Hot and Laser Cutting
C. Koroschetz, M. Skrikerud, L-O. Jönsson, AP&T AB; H. Porzner, D. Lorenz, M. Hoss, ESI GmbH

Combined Cutting and Local Heat Treatment With Laser Radiation of Ultrahigh-Strength Press-Hardened Steels
S. Vogt, F. Schneider, A. Weisheit, Fraunhofer Institute for Laser Technology

Corrosion Performance of Aluminized Steel With ZnO Coating on the Surface
X. Agirretxe, J.M. Martin, M. Carranza, BATZ S.Coop; L. Galdos, J. Mendiguren, Mondragon Unibertsitatea; D. Casellas, R. Hernandez, Fundació CTM Centre Tecnológic

16:00–17:00 | Tool Steel
Osgoode Ballroom West
Session Chair: *Patricia Miller, Bohler-Uddeholm Corp.*

Recent Developments in Tool Steels for Press-Hardening Tools
I. Valls, A. Hamasaiid, Rovalma S.A.

The Selection of Tool Steels for Hot Stamping Tools With Respect to Increased Loads
R. Rahn, I. Schruff, Kind & Co.

Role of Tool Material in the Interfacial Problematics of Tool/Blank in Press-Hardening Process
A. Hamasaiid, I. Valls, Rovalma S.A.

18:00
CHS² Dinner *Sheraton Centre Toronto*

WEDNESDAY, 3 JUNE 2015

08:50–10:10 | Coatings III*
Osgoode Ballroom East
Session Chair: *Joseph R. McDermid, McMaster University*

Corrosion Performance of Aluminized Steel With ZnO Coating on the Surface
S. Fujita, J. Maki, S. Yamanaka, H. Irikawa, M. Kurosaki, Yawata R&D Laboratory, Nippon Steel & Sumitomo Metal Corp.

The Characteristic Comparison for the Al- and Zn-Coated HPF Steels
I. Sohn, H. Hwang, H. Kim, Y. Cho, J. Kim, POSCO Research Labs

Nanoparticle Coatings: Oxidation Protection During Press Hardening
B. Tigges, S. Benfer, Dechema Forschungsinstitut; A. Tenié, Steel Institute, RWTH Aachen University; M. Yekehtaz, Dechema Forschungsinstitut; W. Bleck, Steel Institute, RWTH Aachen University; W. Fürbeth, Dechema Forschungsinstitut

Coating Preparation for Hot Stamping Born Steel by Pack Cementation Aluminizing
Y. Liu, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong University of Science & Technology; Q. Zhan, Department of Reactor Engineering Research and Design, China Institute of Atomic Energy; B. Zhu, Y. Zhang, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong University of Science & Technology; H. Yang, X. Yuan, Department of Reactor Engineering Research and Design, China Institute of Atomic Energy

**Joint sessions with Galvatech*

08:50–10:10 | **Press-Hardening Steel II**
Osgoode Ballroom West
Session Chair: *James R. Fekete, National Institute of Standards and Technology*

Development of a 1.8 GPa Martensitic Stainless Steel for Hot Stamping Application
G. Badinier, Aperam Research Center; J-M. Herbelin, Aperam Customer Team Auto; P-O. Santacreu, J-D. Mithieux, Aperam Research Center

A New Invention of Super Zn-Coatable Press-Hardened Steel Achieving Strength of 1,800 MPa Combined With 18% Elongation in Hot Stamped Parts
H.L. Yi, P.J. Du, RAL, Northeastern University; B.G. Wang, Easyforming Steel Technology Co. Ltd.

Challenges and Successes on Manufacturing Hot Press-Hardening Steels at CSP® Mills
W. Sun, J. Smiley, Nucor Steel–Berkeley; N. Gao, D. Liu, Teck Metals Ltd.

Quenching and Partitioning (Q&P) Die Quenching Processing of 30MnSiCrB$_6$ Press-Hardening Steel
E.J. Seo, L. Cho, B.C. De Cooman, Pohang University of Science and Technology (POSTECH)

10:10–11:00
Refreshment Break *Main Exhibit Area*

11:00–12:00 | **Tailored Properties V**
Osgoode Ballroom East
Session Chair: *Christian Koroschetz, AP&T AB*

Hot Stamping of Tailored Component — Experiments and Numerical Analysis
G. Lindkvist, H. Åhlin, M. Oldenburg, Luleå University of Technology

Press Hardening of a Martensitic Stainless Steel Sheet Alloy for Manufacturing a Side Sill Demonstrator With Tailored Properties
E.M. García, A. Rautenstrauch, V. Kräusel, Technische Universität Chemnitz; A. Mosel, D. Landgrebe, Fraunhofer Institute for Machine Tools and Forming Technology

The Mechanical and Microstructural Properties of Tailored Hot Stampings Due to In-Die Heating up to 700°C
A. Baldecik, Y. Prajogo, M. Worswick, University of Waterloo

11:00–12:00 | **Modeling & Simulation III**
Osgoode Ballroom West
Session Chair: *Jens Hardell, Luleå University of Technology*

Simulation of a Comprehensive Hot Forming Process and Its Experimental Analyses
M. Stillger, Adam Opel AG; S. Hölzemann, GEDIA GmbH; S. Graff, S-W. Bielefeld, ThyssenKrupp Steel Europe AG; T. Brenne, AutoForm Eng. Deutschland GmbH

Understanding Temperature and Contact Pressure in Hot Stamped Channels
B. Rolfe, School of Engineering, Deakin University; P. Zhang, C. Wang, School of Materials Science and Engineering, Hefei University of Science and Technology; M. Pereira, School of Engineering, Deakin University

Optimization of Finite Element Simulation for Press-Hardening Processes
R. Helmholz, C. Sunderkötter, A. Plath, Volkswagen AG, Group Research; H-E. Marusch, Volkswagen AG; B-A. Behrens, Institute of Forming Technology and Machines, Leibniz University of Hannover

12:00
Closing Session

12:15
Lunch

AIST GALVATECH

CO-ORGANIZED BY MET SOC

DESCRIPTIONS OF EXHIBITING COMPANIES

Exhibitors confirmed as of 1 April 2015 are included. For the latest updates, visit AIST.org.

AICHELIN HOLDING GMBH

www.aichelinusa.com

Established in 1868 in Germany, AICHELIN is a global supplier of heat treatment systems. We supply a wide variety of batch-type and continuous heat treatment furnaces and auxiliary systems for different applications. With more than 1,000 employees in 10 countries, we provide our customers with global solutions and local support. For 25 years, AICHELIN has been producing industrial furnaces in the United States. This year, AICHELIN has introduced a new furnace technology that was developed at our sister company in Austria and already successfully tested at the customer's site: the heatXpress step chain conveyor furnace, a new concept for hot forming/press hardening.

AJAX TOCCO MAGNETHERMIC

www.ajaxtocco.com

Ajax TOCCO Magnethermic supplies systems that provide state-of-the-art heating and melting equipment. These systems offer a wide variety of power and frequencies to best fit our customers' applications. Ajax TOCCO induction technology is providing the answer to many modern strip processing quality and production needs. Ajax TOCCO's expertise with galvanizing, galvannealing, strip preheating, heat treating and curing is at the forefront of applying clean, efficient, precise induction heating and melting technology for the metals industry. Induction has many advantages to offer such as comparatively low capital costs, energy savings, reduced floor space, improved yield and better quality.

AP&T

www.aptgroup.com

AP&T comes from a proud tradition of machine builders and has supplied the sheet metal forming industry with complete lines, automation, presses and tools for more than 50 years. Today the company is a global supplier with a sales and service organization that is present on three continents. The majority of the company's sales turnover comes from delivery of complete line solutions for press hardening of automotive parts to leading brands in the automotive industry worldwide. AP&T has a broad range of lines for production of everything from heat shields, exhaust systems, and consoles to wheel suspension components and crash boxes.

AUTOFORM ENGINEERING USA INC.

www.autoform.com

AutoForm was founded in 1995 in Zurich, Switzerland. Since then, AutoForm has grown continuously and rapidly, and the company is now recognized as a leading provider of software solutions for die design and sheet metal forming simulation. AutoForm offers software solutions for the die-making and sheet metal forming industries. The use of AutoForm software improves reliability in planning, reduces the number of die tryouts and tryout time, and results in higher quality part and tool designs that can be produced with maximum confidence. In addition, press downtime and reject rates in production are substantially reduced.

BEKAERT SOLARONICS

www.bekaert.com

Bekaert Solaronics is a leader in gas/electrical infrared and air drying equipment for a wide range of industries, including the coil coating industry. We have designed, manufactured and installed systems in grain-oriented electrical steel (GOES) and non-grain-oriented electrical steel (NGOES) industries for more than 40 years. We also have many years of experience in pretreatment, primer and top coatings drying. We can satisfy your process requirements with individual units up to fully engineered drying solutions delivered as a complete turnkey package.

CMI INDUSTRY AMERICAS INC.

www.cmigroupe.com

CMI Industry Americas Inc. has been designing and manufacturing customized industrial heat treating equipment worldwide for more than 90 years. CMI Industry offers thermal solutions adapted for new capital investments or revamping/rebuilding existing furnaces to modern standards and safety regulations. CMI covers the primary needs of heat treating equipment of non-ferrous products, carbon steel, stainless steel and silicon steel processes. In addition, we offer experience and expertise for specific applications such as thermal modeling, finite element analysis, operation diagnostics, process improvements, etc. CMI Industry also offers spare parts, field service calls and engineering studies for process and/or quality improvements.

DE-STA-CO

www.destaco.com

DE-STA-CO is a global automation and workholding company that has provided productivity solutions to the manufacturing industry since 1915. Quality, innovation, and service have made DE-STA-CO a leader in the design and manufacture of cost-reducing, flexible automation solutions for industrial customers around the world. The company is committed to the Team DE-STA-CO philosophy, a progressive approach to doing business that focuses on providing consistent, standard-setting service and products to every customer, regardless of geographic location.

EBNER FURNACES INC.

www.ebner.cc

EBNER is a leading manufacturer of heat treatment facilities for the steel, copper and aluminum semi-finished product industries worldwide. We manufacture continuous and batch-type furnaces featuring cutting-edge technology delivering maximum performance and optimum anneal results. EBNER leverages extensive research and development facilities to produce durable components for continuous processing of automotive industry AHSS. The end results are proven heating systems and precise, high-performance cooling technology products like Recoteb® radiant tube/burner systems and HICON/H_2® rapid atmosphere cooling that ensure excellent temperature uniformity. EBNER also designs and supplies reliable hot forming furnaces that meet stringent automotive industry demands for body-in-white components.

FIVES

www.fivesgroup.com

Fives is a global industrial engineering group that designs and supplies machines, process equipment and production lines. Fives provides highly efficient technical solutions for the steel industry, covering carbon, stainless and silicon sectors in flat, long product, tube and pipe, and in rolling and strip processing. Fives' global offer includes reheating furnaces, cold rolling mills, and processing lines including furnaces, skinpass mills, surface treatment technologies and high-flux inductors. Fives also offers a wide range of expert services, including metallurgical assistance, design, manufacture and retrofit of mechanical, thermal and finishing equipment, as well as on-site assistance, auditing, technical consulting and downstream client support.

INDUGA INDUSTRIEOFEN UND GIESSEREI-ANLAGEN

www.induga.com

INDUGA is a medium-sized enterprise active in the field of foundry and plant engineering. Since the establishment of the company more than 30 years ago, our hallmark has been our versatility and individuality in the field of induction furnace technology. Our customers are primarily foundries, steel works and processors of liquid metals, e.g., manufacturers of semi-finished products for the automotive industry as well as the automotive industry itself. INDUGA will present its products and developments in the field of steel strip coating with different alloys such as Zn, ZnMg, AlZn, AlSi and the hot-dip galvanizing technology.

JOH. CLOUTH MASCHINENBAU ELTMANN GMBH

www.clouth-eltmann.com

Joh. Clouth Maschinenbau Eltmann GmbH & Co. KG is a dynamic manufacturer of custom-designed capital equipment, focusing on doctoring and doctor systems for the steel industry. Product reliability, customer service and short delivery times have made us a key supplier to steel mills around the world. Joh. Clouth Maschinenbau Eltmann specializes in cleaning and special treatment of cylinders and roll surfaces in the steel industry. The performance of our equipment is assured due to our experience in the applications and the use of top-quality manufacturing standards. Excellent cleaning of roll surfaces is assured by the use of high-quality oscillating doctor systems.

LINDBERG/MPH

www.lindbergmph.com

Lindberg/MPH is a supplier of world-class, batch hot stamping solutions for the automotive market. Our solutions include turnkey furnace and automation packages that can be supplied for new or existing installations. All systems will meet AMS2750E and CQI-9 requirements. Lindberg/MPH includes control systems that feature SCADA packages that can be matched to work with all press systems and factory automation. Equipment is engineered and built in Michigan (USA) and supported worldwide.

MACRODYNE TECHNOLOGIES INC.

www.macrodynepress.com

Macrodyne Technologies is a manufacturer of heavy-duty, high-quality hydraulic presses up to 20,000 tons, fully automated press lines and die handling equipment for dies weighing in excess of 100 tons. Precision, functionality and repeatable performance are key variables we consider during the design phase of every project. Our success is evidenced by an extensive list of customers who continue to purchase Macrodyne hydraulic presses and die handling equipment on a repeat basis. We utilize industry-leading hydraulic and electrical components in our equipment, ensuring high-quality, reliable, technologically advanced production equipment, with replacement components that can be sourced worldwide. For more information, visit us at www.macrodynepress.com or call us at +1.800.336.0944.

PRAXAIR SURFACE TECHNOLOGIES INC.

www.praxairsurfacetechnologies.com

Praxair Surface Technologies is making more possible for steel sheet and strip producers by improving product quality and extending component performance with advanced thermal spray coatings and laser-weld overlays. You face unique challenges: parts need to withstand wear, high temperatures and corrosion.

Praxair Surface Technologies' advanced thermal spray coatings offer release and pickup resistance on rolls used in furnaces or molten-metal pots, better wear resistance than chrome and better toughness than rubber. Look to Praxair Surface Technologies' laser-weld carbide overlays as an advanced alternative to traditional welding to improve roll and bearing life. We know the parts we coat are critical components where failure is not an option.

QUAKER CHEMICAL CORP.

www.quakerchem.com

Quaker Chemical focuses on providing a combination of chemical specialties, services and technical expertise that helps reduce costs, improve performance and achieve a safe work environment. Our QUINTOLUBRIC® line of fire-resistant hydraulic fluids keeps your machines working at optimal performance with fewer interruptions and a longer life span for a lower total cost of ownership, increased safety and reduced risk. Our experts work with you to improve operations, process and efficiency, from designing complete lubrication solutions to solving specific protection problems.

QUINLOGIC LLC

www.quinlogic.de

QuinLogic is a software company focusing on quality assurance tools for the metals industry. Our mission is to create additional value for steel rolling mills through data processing. Our method is software. Our product is the Quality Execution System (QES). Its most pioneering module is the LogicDesigner. This tool converts production or end-customer specifications into a consistent and verified rule base. Through additional QuinLogic software modules, the same data can be used for product or process review for troubleshooting and root-cause analysis. QES is applicable for a single line as well as for the entire process chain.

ROTADYNE

www.rotadyne.com

RotaDyne is a global leader in providing roller-related solutions to the metals industry. With headquarters and R&D operations in Chicago, Ill., USA, and more than 30 roller manufacturing facilities around the world, RotaDyne designs, engineers and manufactures a complete line of elastomeric and metal-covered rollers and sleeves to service all aspects of the metals rolling and finishing industry. From shapemeter rolls to wringer, squeegee and bridle rolls, to packaging line, slitter pinch and blocker rolls, the RotaDyne continuous improvement philosophy is founded in collaborative applications and reliability engineered solutions. The RotaDyne fleet of trucks provides pickup and delivery services throughout the U.S. and Canada.

SAMWOO ECO LTD.

www.samwooeco.co.kr

We have grown into a global leader in specialized facility installation due to our expertise and experience. We have shown that we are dedicated to the development of technologies with our research lab and our committed investment in facilities over the last 24 years. We will be displaying our featured products, the air knife system and roll shop equipment. Our major features are air cylinder-type external lip cleaner, touchless edge mask and our blowing wide adjustment system. The roll shop equipment is used to automate the assembling/disassembling work of rolls and chocks in the rolling process.

SARCLAD NA

www.sarcladna.com

Sarclad is a global company headquartered in the United Kingdom with a sales and technical support base in the U.S. and China and representatives around the world. Sarclad has been supplying equipment to the steel and non-ferrous industries for more than 30 years. Sarclad is a leading supplier of EDT roll texturing equipment, roll inspection equipment and continuous caster strand monitoring equipment. The company has developed market-leading products by investing in research and development, understanding the industry, and providing reliable customer support.

SCHULER

www.schulergroup.com

Schuler is a technological and global market leader in forming equipment. The company offers cutting-edge presses, automation, dies, process know-how and services for the entire metal forming industry and lightweight vehicle construction. Its clients include car manufacturers and their suppliers, as well as companies in the forging, household equipment, packaging, energy and electrical industries. Schuler is a leader in coin minting presses and supplies systems solutions for the aerospace, railway and large pipe industries. With around 5,400 employees, Schuler is represented in 40 countries and is a member of the Austrian ANDRITZ Group.

SCHWARTZ GMBH TREATMENT SYSTEMS

www.schwartz-wba.de

Schwartz is an internationally renowned company pursuing its activities worldwide. For three decades, we have been a leading manufacturer of heat treatment equipment. Our products have successfully found their way into many automotive industry and component supplier applications, glassmaking, steel and non-ferrous metal processing, and aircraft manufacturing. In addition to our headquarters in Simmerath, Germany, where all Schwartz equipment is designed, built and subjected to start-up tests, we opened a branch facility in Shanghai, P.R. China, in 2011. From there, additional support is provided to our Asian markets. A service point in Chicago, Ill., USA, was added in 2012.

SMS TECHNICAL SERVICES LLC

www.sms-technicalservices.us

SMS Technical Services, headquartered in Cranberry Twp., Pa., USA, is a comprehensive supplier of parts,

equipment upgrades, maintenance and field services for the metals industry in North America. With the assistance of our fellow SMS Group company Duma BandZink (Germany), and our coating technology partner Tocalo Ltd. (Japan), SMS Technical Services is a complete maintenance provider for CGL and CAL operations in North America. SMS Technical Services facilities offer primary services such as pot roll coating and furnace roll coating services, as well as complete pot rig and snout maintenance services.

SPRAYING SYSTEMS CO.

www.spray.com

Spraying Systems Co. is a leader in spray nozzles, providing the best in spray nozzles and accessories, complete integrated systems, support services and expertise to the steel industry. We offer a complete line of products designed specifically for use in steel mills, including cooling in continuous casting, hot mill and finishing mill operations; descaling, coating, rinsing and cooling for pickling lines; gas conditioning, pollution control, quenching and cooling in cokemaking operations; and many other applications.

STROTHMANN MACHINES & HANDLING GMBH

www.strothmann.com

Based in Schloss Holte-Stukenbrock, Germany, STROTHMANN Machines & Handling GmbH provides automation solutions for mechanical engineering, automotive industry, aircraft assembly, wind energy industry and other sectors. STROTHMANN develops and integrates entire new press lines automation and assembly lines as well as modernization projects in order to optimize production processes throughout the value-added chain. Founded in 1976, the company offers a comprehensive program of handling technologies with a special focus on linear robots. STROTHMANN's RoundTrack® technology, a rail system suitable for the shop floor, enables ideal logistics solutions, particularly in heavy load applications.

TAYLOR-WINFIELD TECHNOLOGIES

www.taylor-winfield.com

Taylor-Winfield Technologies is an original equipment manufacturer of coil joining and material handling systems. Operating out of a state-of-the-art office and manufacturing complex, we are dedicated to bringing advanced manufacturing technologies and process solutions to our customers worldwide. By providing simple to complex coil joining machines, post-weld induction heating systems, and heavy material (coil) handling systems with ongoing field service and replacement parts support, Taylor-Winfield remains the company customers have trusted for more than 130 years. Visit us at our booth. For more information, visit www.taylor-winfield.com.

TECNAR

www.tecnar.com

Tecnar manufactures the GALVALIBS sensor, which is a laser-based technology for real-time pot chemistry measurements. The sensor simultaneously monitors elements such as aluminum, iron, magnesium, silicon and tin. It also measures the amount of dross particles floating around the pot. The GALVALIBS allows continuous galvanizing lines to enhance precision on the pot chemistry and to learn what practices generate the best quality. Please come and meet us at our booth to discuss your vision of enhanced quality control and see the product for yourself.

THERMO SCIENTIFIC

www.thermoscientific.com/metals

Thermo Scientific gauges deliver the measurement solutions needed by your galvanizing line. Our instruments provide measurements for both hot and cold coatings and, when coupled with our closed-loop coating control software, ensure coating uniformity and improved quality during changes in product setpoint. We also offer a complete range of non-contact thickness gauges for hot and cold rolling mills within the steel and aluminum industries, providing a variety of solutions for precise real-time measurements during the production of metals plate and sheet. For more information on our extensive range of coating weight and thickness gauging products, visit our website: www.thermoscientific.com/metals.

WS THERMAL PROCESS TECHNOLOGY INC.

www.flox.com

WS developed the REKUMAT® high-velocity, self-recuperative burner series, which uses hot exhaust gases to preheat combustion air in counterflow and can thereby achieve efficiencies up to 75%. The REGEMAT® self-regenerative burners integrate regenerators and switching valves into one compact unit. An efficiency of up to 88% LHV is possible due to the superior heat exchange between exhaust and combustion air. Both burner types are capable of using the FLOX® technology and can be applied in Double-P Tubes. With more than 75,000 industrial burners installed worldwide since 1982, WS has proven that energy-saving combustion systems have become increasingly important. ✦