



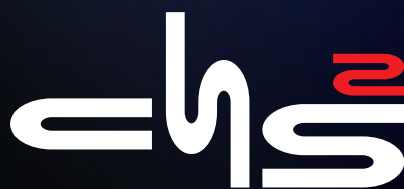
CONFERENCE  
AND  
EXPOSITION



TORONTO, ONT., CANADA

# GALVATECH

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



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

**REGISTRATION NOW AVAILABLE!**

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

## GALVATECH CONFERENCE TOPICS

*Preliminary program now online!*

- New Coating Lines and Technologies
- Green Coating Technologies
- Automotive Applications
- Construction Applications
- Appliance Applications
- Process Technologies
- Surface and Interfacial Analysis
- Metallic Coating of Advanced High-Strength Steels
- Conversion Coatings and Pre-Painted Steels
- Coating Technologies for Hot Stamping and Hot Press Forming
- Corrosion and Corrosion Monitoring of Metallic Coated Steels
- Joining and Forming of Metallic Coated Steels
- Metallic Coated Steels for Designers, Architects and Other Specifiers
- Zinc and Zinc Alloy Coated Sheet Steel Process Technologies

## CHS<sup>2</sup> CONFERENCE TOPICS

*Preliminary program now online!*

### Material

- High-Performance Steel
- Tool Steel
- Microstructural Properties
- Surface Design and Coatings

### Modeling and Simulation

- Microstructure
- Heat Transfer
- Thermomechanical Properties
- Process Modeling
- Deformation and Fracture
- Component Properties
- Friction and Wear

### Process Design

- Heating and Cooling Strategies
- Tool Systems
- Automation and Control
- Process Monitoring

### Products

- Tailored Material Properties
- Cutting and Joining Technologies
- Applications and Performance Design

## GALVATECH AND CHS<sup>2</sup> REGISTRATION PRICING

**AIST Member:** US\$1,050

**AIST Non-Member:** US\$1,200

**Student Member:** US\$400

**Student Non-Member:** US\$550

**REGISTER AT  
AIST.ORG**

*After 31 March 2015, there will be a US\$200 increase for conference registrations and US\$100 for students.*

**31 MAY–4 JUNE 2015**  
**SHERATON CENTRE TORONTO**  
**TORONTO, ONT., CANADA**

**GALVATECH AND CHS<sup>2</sup> 2015 SCHEDULE OF EVENTS**

**Sunday, 31 May 2015**

4–6 p.m. Registration  
 5–6:30 p.m. Welcome Reception and  
 Exposition

**Monday, 1 June 2015**

7:30 a.m.–5 p.m. Registration  
 8:30–10 a.m. Opening Session  
 8:30 a.m.–5 p.m. Exposition  
 10–10:15 a.m. Refreshment Break  
 10:15 a.m.–Noon Technical Sessions  
 Noon–1 p.m. Lunch  
 1–3 p.m. Technical Sessions  
 3–3:15 p.m. Refreshment Break  
 3:15–5 p.m. Technical Sessions  
 6–9 p.m. Banquet at the Hockey Hall  
 of Fame

**Tuesday, 2 June 2015**

7:30 a.m.–5 p.m. Registration  
 8:30–10 a.m. Technical Sessions  
 8:30 a.m.–5 p.m. Exposition  
 10–10:15 a.m. Refreshment Break  
 10:15 a.m.–Noon Technical Sessions

Noon–1 p.m. Lunch  
 1–3 p.m. Technical Sessions  
 3–3:15 p.m. Refreshment Break  
 3:15–5 p.m. Technical Sessions  
 6–9 p.m. CHS<sup>2</sup> Attendee Dinner

**Wednesday, 3 June 2015**

7:30–10 a.m. Registration  
 8:30–10 a.m. Technical Sessions  
 8:30 a.m.–1 p.m. Exposition  
 10–10:15 a.m. Refreshment Break  
 Noon–1 p.m. Lunch  
 1–3 p.m. Technical Sessions

**Thursday, 4 June 2015**

8 a.m.–Noon Plant Tours: ArcelorMittal Dofasco  
 Inc. or U. S. Steel Canada —  
 Hamilton Works

*The schedule of events is subject to change without notice.*

**HOUSING**

A block of rooms has been reserved at the Sheraton Centre Toronto. Please make your reservation online at [AIST.org](http://AIST.org) or call the hotel at +1.888.627.7175 by 8 May 2015 to secure the AIST Galvatech and CHS<sup>2</sup> discount rate of US\$249 per night for single/double occupancy.



# AIST GALVATECH



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 (**CHS<sup>2</sup>**) will co-locate in Toronto, giving exhibitors a unique opportunity to reach a targeted audience.

The combined coffee breaks and lunches will offer exhibitors valuable exposure and networking possibilities. The exposition is intended to provide companies and institutions a space to display and demonstrate their products, services and technologies.

## BOOTH SPECIFICATIONS

- 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.

## BOOTH COST INCLUDES

- Two chairs and one 6' table.
- 15-amp electrical drop.
- Standard draperies.
- Siderails.
- One conference registration.
- One complimentary AIST membership for 2015.

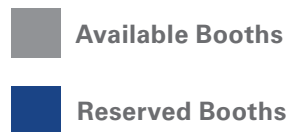
## ASSIGNMENTS

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](http://AIST.org). Once the contract has been received, you will receive a confirmation with the booth location.

## SHERATON CENTRE TORONTO

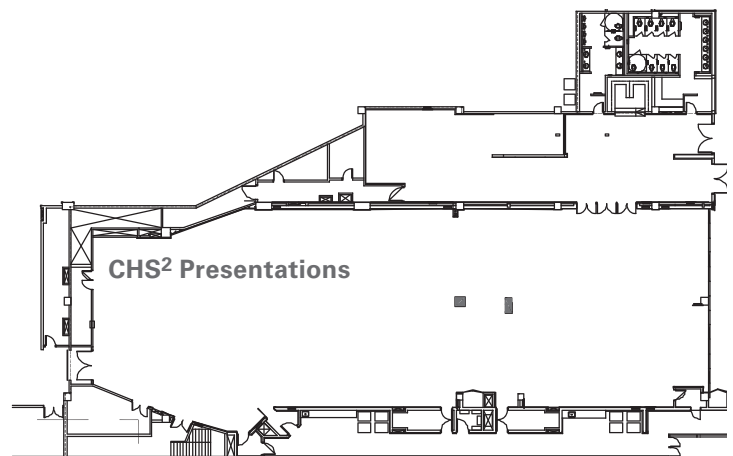


### Set Up

*Sunday, 31 May: 10 a.m.–5 p.m.*

### Tear Down

*Wednesday, 3 June: 1–5 p.m.*

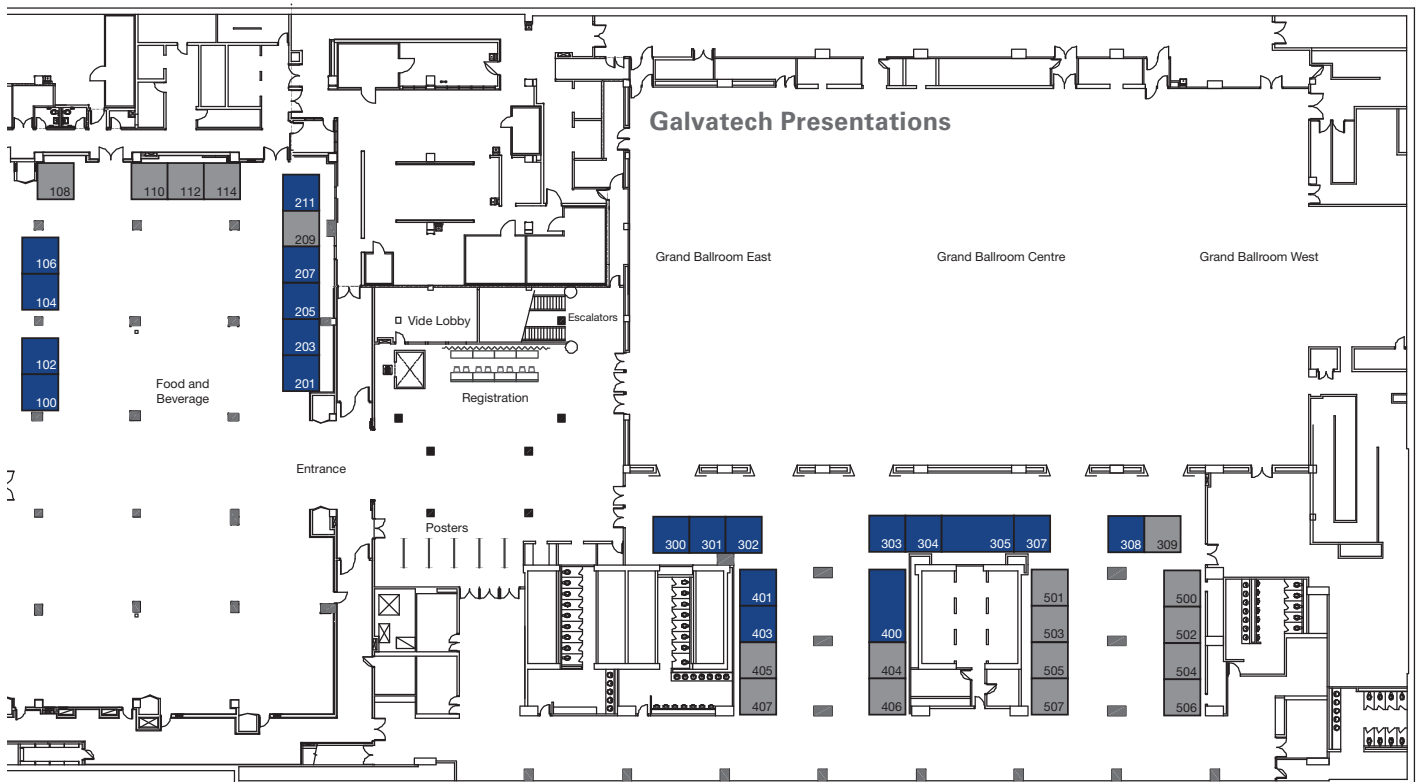




31 MAY-4 JUNE 2015  
**SHERATON CENTRE TORONTO**  
**TORONTO, ONT., CANADA**

**CURRENT EXHIBITORS**

- AICHELIN Holding GmbH . . . . . Booth #106
- Ajax TOCCO . . . . . Booth #400
- AutoForm Engineering USA Inc. . . . . Booth #211
- CMI Industry Americas Inc. . . . . Booth #301
- DE-STA-CO . . . . . Booth #100
- Fives . . . . . Booth #305
- INDUGA Industrieofen und  
Giesserei-Anlagen . . . . . Booth #300
- Lindberg/MPH . . . . . Booth #307
- Praxair Surface Technologies Inc. . . . Booth #303
- QuinLogic LLC . . . . . Booth #201
- Samwoeco Ltd. . . . . Booth #302
- Sarclad NA . . . . . Booth #401
- Schwartz GmbH Treatment  
Systems . . . . . Booth #203
- Spraying Systems Co. . . . . Booth #207
- Strothmann Machines and  
Handling GmbH . . . . . Booth #102
- Taylor-Winfield Technologies. . . . . Booth #104
- Tecnar Automation Ltd. . . . . Booth #205
- Thermo Fisher Scientific. . . . . Booth #308
- WS Thermal Process  
Technology Inc. . . . . Booth #403



## SPONSORSHIP OPPORTUNITIES

A sponsorship is a cost-effective way to reach the targeted audiences at Galvatech and CHS2 2015 in one location. Reserve sponsorships online at [AIST.org/Galvatech-CHS2-Sponsorships](http://AIST.org/Galvatech-CHS2-Sponsorships).

### – EVENT SPONSOR US\$25,000

*(2 available or exclusive)*

**Sponsorship includes:** Company logo on all event signage, conference Web page, I&ST magazine pages and plenary session PowerPoint presentations. One full-page 4-color ad in the June issue of *I&ST* and a full-page 4-color ad on the front inside cover of Final Program. One 10'x10' booth in exhibit area. Two full conference registrations. Company logo and recognition as event sponsor on all tables throughout breakfast, lunch and dinner areas. One promotional item to be distributed to all conference attendees.

### – MONDAY BANQUET US\$6,000 *(4 available)*

**Sponsorship includes:** Company logo on signage at banquet, full-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – SUNDAY EXHIBIT HALL WELCOME RECEPTION US\$4,000 *(4 available)*

**Sponsorship includes:** Company logo on signage at reception, half-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – MONDAY LUNCH US\$4,000 *(4 available)*

**Sponsorship includes:** Company logo on signage at lunch, half-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – TUESDAY LUNCH US\$4,000 *(4 available)*

**Sponsorship includes:** Company logo on signage at lunch, half-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – MONDAY COFFEE BREAKS US\$4,000

*(4 available)*

**Sponsorship includes:** Company logo on signage at morning and afternoon breaks, half-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – TUESDAY COFFEE BREAKS US\$4,000

*(4 available)*

**Sponsorship includes:** Company logo on signage at morning and afternoon breaks, half-page 4-color ad in conference program and inclusion in plenary session PowerPoint presentation.

### – LANYARDS US\$3,000 **SOLD**

**Sponsorship includes:** Company-supplied lanyards placed at the registration counter for attendee utilization and a half-page 4-color ad in conference program. (AIST must approve lanyards prior to distribution.)



### – PENS US\$2,000 *(exclusive)*

**Sponsorship includes:** Company-supplied pens staged at all conference tables for attendee use and a half-page 4-color ad in conference program. (AIST must approve pens prior to distribution.)

### – NOTEBOOKS US\$3,000 *(exclusive)*

**Sponsorship includes:** Company logo on the front cover of the notebooks distributed to all conference attendees and a half-page 4-color ad in conference program.

### – WATER BOTTLES US\$3,500 **SOLD**

**Sponsorship includes:** Company logo on the front of the water bottle distributed to all conference attendees and a half-page 4-color ad in conference program.



### – GALVATECH PROCEEDINGS ON FLASH DRIVE US\$3,000 *(exclusive)*

**Sponsorship includes:** Company logo on the back of the flash drive distributed to Galvatech conference attendees and a half-page 4-color ad in conference program.



# GALVATECH



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 by:** F.E. Goodwin, J.R. McDermid,  
P. Badgley and I. O'Reilly

8:20-10:00

**Galvatech Plenary Lectures** *Grand Ballroom East*

**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*

**Plenary Lecture From Japan**

*M. Mori, Toyota Motor Corp.*

**North American Zinc-Based Sheet Steel Coatings Technology: Production and Product Performance Update and Challenges**

*F.E. Goodwin, International Zinc Association; E. Silva, United States Steel Corporation 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*

**Automotive Steel and Galvanizing Line Process Evolution: A Review (Keynote)**

*D. Delaunay, Fives Stein; 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, Fives Stein*

10:20-12:00 | **Automotive Applications I**

*Grand Ballroom Center*

**Experience of ArcelorMittal Dofasco in Automotive Exposed GI and GA Production (Keynote)**

*W. Zhong, T. Le, I. O'Reilly, B. Nelson, ArcelorMittal*

**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 Co.*

10:20-12:00 | **AHSS GA**

*Grand Ballroom West*

**Control of the Iron-Zinc Phases Formation During the Galvannealing Process of Bake Hardenable Steel (Keynote)**

*A. Barbosa, S. Goulart-Santos, Usiminas; V. Buono, Metallurgical and Material Engineering Department of UFMG*

**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*

**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)

**Study on Galvannealing Process of Galvannealed Dual-Phase Steel**

L-B. Liu, School of Material Science and Engineering, University of Science and Technology Beijing; H-X. Teng, H-Q. Wang, Shougang Research Institute of Technology

12:00–13:20

**Lunch** Main Exhibit Area

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

Grand Ballroom East

**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.

**Galvanneal Furnace Analysis and Control Methods Discussion**

W. Lu, Baosteel-NSC Automotive Steel Sheets Co. Ltd.

**Radiant Tube Life Improvement for Vertical Galvanizing Lines**

J. Wuening, WS GmbH

**13:20–15:00 | Automotive Applications II**

Grand Ballroom Center

**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

**Determination of Compositional Limits of Different Alloying Elements to Produce Galvanized Next-Generation Advanced High-Strength Steels**

A. Chakraborty, M. Zuiderwijk, D. Hanlon, Research and Development, Tata Steel

**Galvanizing-Related Surface Properties of Mn-Alloyed Third-Generation AHSS**

L. Cho, 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

**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, Department of Materials Science and Engineering, 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

**Coating Formation of Hot-Dip Galvanized Press-Hardening Steel**

A. Oppermann, Johannes Kepler University Linz; T. Mörtlbauer, voestalpine Stahl GmbH

**Zinc Diffusion and  $\alpha$ -Layer Growth During Annealing of Zinc Coated 22MnB5**

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; Seetharaman Sridhar, WMG

15:00–15:20

**Afternoon Refreshment Break** Main Exhibit Area

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

**Control**

Grand Ballroom East

**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

**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

**Effect of Tool Materials on Friction Properties of Galvannealed Steel Sheet**

K. Hoshino, S. Taira, Y. Yamasaki, JFE Steel Corp.; W. Tanimoto, JFE Techno-Reserch Corp.; M. Nagoshi, 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, Department of Ferrous Metallurgy, RWTH Aachen University; F.E. Goodwin, International Zinc Association

**Experimental Investigation of Continuous Annealing Process of a 1,180-MPa Grade Cold Rolled and Hot-Dip Galvanized Dual-Phase Steel**

H. Zhang, Research Institute, Baoshan Iron and Steel Co. Ltd.

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

Grand Ballroom West

**Coil Applied Coating for Press-Hardening Steel**

W. Fristad, Henkel Corp.

**Developing New Zinc Base Alloys With Improved Properties at High Temperatures**

A.M. Garay-Tapia, A. Arizmendi, D. Torres, CIMAV; J.P. Pedraza, O. Garcia, A. Esaa, Ternium

**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

**Characterization of Bearings for Aluminizing Bath Hardware**

M. Didier, P. Durighello, G. Ferrier, ArcelorMittal R&D

18:00

**Banquet Dinner at the Hockey Hall of Fame**

**TUESDAY, 2 JUNE 2015**

07:30–08:15

**Author Breakfast**

8:20–17:00

**Poster Session** Main Exhibit Area

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

Grand Ballroom East

**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, CMI Metals; 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 Mannemann 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, Galvanizing Technology Development Team, Surface Treatment Department, POSCO; S-H. Jeon, Surface Treatment Research Group, POSCO; D-G. Kang, Quality Control Department, POSCO; S-Y. Choun, Galvanizing Technology Development Team, Surface Treatment Department, POSCO; M-H. Hong, Steel Production Division, POSCO

**08:20–10:00 | Construction/Appliance**

Grand Ballroom Center

**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

**Prepainted 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.

### Research and Development of Masteel Hot-Dip Galvanized Product With Functional Coating

Y. Xingliang, Z. Yunlong, Maanshan Iron and Steel Co. Ltd.

### 08:20–10:00 | AHSS Galvanizing I

Grand Ballroom West

#### 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, Sheet Products Development Section, R&D Laboratory, Kobe Steel Ltd.

#### Galvanizing of Advanced High-Strength Steels and Pre-Oxidation in Continuous Galvanizing Line and Hot-Dip Galvanizing Simulator

M. Zijderwijk, J. Pool, M. Crujff, A. Chakraborty, W. Melfo, I. Davies, Tata Steel

#### 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, CRMgroup

10:00–10:20

Coffee Break Main Exhibit Area

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

Grand Ballroom East

#### Numerical Analysis of the Modification of Flow Using a Pumping System in the Galvanizing Bath (Keynote)

F. Ilinca, National Research Council of Canada; Frank Ajersch, Ecole 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 for Galvalume®

Y. Xu, Shanghai Meishan Iron and Steel Co. Ltd.

### 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

#### 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 and 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 and Sumitomo Metal Corp.; N. Shiragaki, S. Fujii, Nippon Steel and 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 and Sumitomo Metal Corp.; I. Muto, Tohoku University

#### Alloying of Zn-Al-Mg Coatings for Corrosion Stability Improvement

T. Prosek, Institut de la Corrosion/French Corrosion Institute; F.E. Goodwin, International Zinc Association; D. Thierry, Institut de la Corrosion/French Corrosion Institute

#### Development of Mg-Added 55%Al-1.6%Si-Zn Coated Steel Sheets

S. Fujii, N. Shiragaki, H. Kanai, Nippon Steel and Sumikin Coated Sheet Corp.; N. Shimoda, Nippon Steel and Sumitomo Metal Corp.

### 10:20–12:00 | AHSS Galvanizing II

Grand Ballroom West

#### 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, Albert, G. Monfort, Centre de Recherches Metallurgiques; A. Jarosik, R. Sagl, voestalpine Stahl; Vogel, 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, Surface Technology Research Group, Technical Research Labs, POSCO

#### Recent Improvement of Understanding in Galvanizing Process of TWIP Steel

Y. Kim, McMaster University; J. Lee, Korea University; K-S. Shin, Research Institute of Industrial Science and Technology; S-H. Jeon, POSCO; K-G. Chin, POSCO; J.R. McDermid, McMaster University

#### 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, Ecole Centrale Paris; A. Koltsov, J-M. Maigne, 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

**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, Department of Materials Engineering, Hanyang University; S.K. Lee, Technical Research Center, POSCO; D.J. Paik, M.H. Hong, Surface Treatment Department, POSCO; J.H. Park, Department of Materials Engineering, Hanyang University

**Experimental Study of Skimmings Generation in Galvanizing 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, Department of Materials Engineering, Hanyang University; D.J. Paik, M.H. Hong, Surface Treatment Department, POSCO

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

Grand Ballroom Center

**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 and Sumitomo Metal

**Characterization of the Fe-Al Intermetallic Phases Formed in Hot-Dip Al-Zn-Mg Coatings**

C-W. Hsu, G-L. You, Department of Materials and Optoelectronic Science, National Sun Yat-Sen University; K-K. Wang, Metal Industries Research and Development Centre; L. Chang, D. Gan, Department of Materials and Optoelectronic Science, National Sun Yat-Sen University; L-J. Chiang, Steel Research and Development Department, 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

**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. Maigne, ArcelorMittal Global R&D — Maizières Automotive Products; M-L. Giorgi, Ecole 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

**Recent Improvements in Pot Roll Bearing and Sleeve Coatings**

M. Hall, McDanel Advanced Ceramic Technologies

**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*

**Roller Bearings for Pot Rolls in Hot-Dip Galvanizing Lines – A Novel Design Concept and Up-to-Date Trial Experiences**

*A. Kouscheschi, M. Black, M. Mola, D. Plätzer, Duma-Bandzink GmbH*

**15:20–17:00 | Corrosion Performance of Galvanized Sheet**

*Grand Ballroom 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, Teck Metals Ltd.; 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*

**XPS and EELS Characterization of Mn<sub>2</sub>SiO<sub>4</sub>, MnSiO<sub>3</sub> and MnAl<sub>2</sub>O<sub>4</sub> (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*

**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*

**A Study on Electrochemical Impedance Spectroscopy of Galvannealed Phases (Keynote)**

*A. Chakraborty, A. Mondal, A. Pathak, Tata Steel R&D; 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, Institut de la Corrosion/French Corrosion Institute

**Analysis of Passivation Film Whitening on Environment Friendly Hot-Dip Galvanizing Steel Sheet**

T. Guo, Pangang Group Research Institute Co. Ltd., State Key Laboratory of Vanadium and Titanium Resources Comprehensive Utilization; C. Liu, School of Materials and Metallurgy, Northeastern University

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

Grand Ballroom West

**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, Ecole 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, Metal Sciences (Metallkunde); 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

**The Effect of Auxiliary Jets on Air-Knife Instabilities**

D. Finnerty, J.R. McDermid, S. Ziada, McMaster University; F.E. Goodwin, International Zinc Association

**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

**Additional Performance of the DEMCO**

M. Sloan, Fontaine Engineering Inc.

**Installation and Operating Experience With a Spooner After-Pot Strip Cooler and Stabilizer at DJ Galvanizing**

P. Henderson; James O'Dwyer

**Ancillary Benefits of the High Performance of Danieli X-Jet**

N. Kohler

**10:20–12:00 | New Conversion Coatings**

Grand Ballroom Center

**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

**Influence of Carbon Content on Oxidation Behaviour of Si Containing Steel**

M. Tanaka, Y. Suzuki, N. Yoshimi, Coated Products Research Department, Steel Research Laboratory

**Selective Oxidation and Reactive Wetting of 6Mn-2Si and 2Mn-1.5Si Advanced High-Strength Steels**

M. Pourmajidian, A. Rafiei, J.R. McDermid, Steel Research Centre, 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

### Advanced Packing Technology for Coated Products Toward Value Addition and Cost Savings

*M. Rissanen, Pesmél Oy; J. Rajagopalan, Pesmél 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*

### 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

### Preparation and Performance of Water-Based Chromate-Free Lubricating Film for Galvanized Steel Sheet

*X. Liu, Q.-F. Zhang, S.-M. Jiang, China Iron and Steel Research Institute Group, National Engineering Lab of Advanced Coating Technology for Metals*

### Study on Environment-Friendly Passivation for Hot-Dip Galvanized Steel With High Corrosion

*X. Dong, T. Guo, C. Ran, PanGang Group Research Institute Co. Ltd., State Key Laboratory of Vanadium and Titanium Resources Comprehensive Utilization*

### 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

*P. Yang, Y. Zhang, X. Gu, 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

### 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*

### Comparative Studies of the Corrosion Behavior of Galvanized and Galvannealed Steel

*B. Goo, W. Yang, M. Moon, Hyundai Steel Co.*

### 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.*

## Poster Session Papers

### 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, UFGM — Federal University of Minas Gerais; R.O. Rocha, F.S. Costa, Usiminas S.A.*

### The Study of Anti-Corrosion Properties of Tannic Acid- $H_2TiF_6/SiO_2$ Composite Coatings on Hot-Dip 55%Al-Zn Alloy Coated Steel Sheet

*Z. Xu, Q. Xu, PanGang Group Research Institute Co. Ltd.*

### 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*

\*Joint with CHS<sup>2</sup> (F2 and F3)

## 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, Sweden*

08:40

**Opening Speech** *Osgoode Ballroom East*

### 09:00–10:00 | Tailored Properties I

*Osgoode Ballroom East*

#### 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, T. Harrer, Trumpf Laser-und Systemtechnik GmbH; D. Schuoecker, J. Aichinger, Oberösterreichisches Laserzentrum e.V.*

#### Hot Forming and Subsequent Cooling Outside the Press for Adjusted Tailored Properties of 22MnB<sub>5</sub> Steel Sheets

*B.-A. Behrens, J. Schrödter, J. Moritz, C.M. Gaebel, Institute of Forming Technology and Machines, Leibniz Universität; H.J. Maier, F. Nürnberger, L. Wolf, Institute of Materials Science, Leibniz University of Hanover*

### 09:00–10:00 | Hydrogen Embrittlement

*Osgoode Ballroom West*

#### Investigating the Interaction Between Hydrogen and Press-Hardened Materials

*J. Weczera, C. Sunderkötter, A. Plath, Volkswagen AG, Group Research; M. Rhode, BAM Federal Institute for Materials Research and Testing; S. Jüttner, Institute of Materials and Joining Technology, Otto von Guericke Universität*

#### Influence of Microstructures on Hydrogen Embrittlement Susceptibility of Hot Stamped Ultra High-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, Schilde; S. Zhang, College of Mechanical Engineering; H. Lu, W. Wang, CITIC Metal Co. Ltd.; Y. Zhang, L. Wang, University of Science and Technology*

10:00–10:20

**Refreshment Break** *Main Exhibit Area*

### 10:20–12:00 | Coatings I

*Osgoode Ballroom East*

#### 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.*

#### Micro-Crack Investigation in Zinc Coating Layer on Boron Steel Sheet in Hot Press Forming Process

*H-H. Seok, J-C. Mun, Pusan National University; O-D. Lim, AutoGen; C-G. Kang, Pusan National University Engineering Research Center for Net Shape and Die Manufacturing*

#### Microstructural Features of Liquid Metal Embrittlement Cracks in Zn-Coated 22MnB<sub>5</sub> Press-Hardening Steel

*H. Kang, L. Cho, C. Lee, B.C. De Cooman, GIFT, Pohang University of Science and Technology (Postech)*

#### 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*

### 10:20–12:00 | Formability and Failure

*Osgoode Ballroom West*

#### Flow Curve Determination for Hot Sheet Metal Forming Processes Using a Hot Gas Bulge Test

*A. Braun, M. Bambach, G. Hirt, Institute of Metal Forming, RWTH Aachen University; J. Storz, Institute for Fluid Power Drives and Controls, RWTH Aachen University*

#### 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*

#### The Effect of Isolated Deformation Modes on the Appearance of Cracks in Hot Stamped Zinc-Coated Boron Steel

*J. Pujante, D. Casellas, Fundació CTM Centre Tecnològic; A. Ademaj, University of Kassel, Chair of Metal Forming Technology; H. Schwinghammer, T. Kurz, voestalpine Stahl GmbH; G. Hensen, Tata Steel R&D*

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## **A New Technique for Determining Forming Limit Diagrams for Hot Stamping**

X. Li, L. Feng, Shougang Research Institute of Technology; N. Li, J. Lin, D. Balint, Imperial College London

12:00–13:20

**Lunch** Main Exhibit Area

## **13:20–14:20 | Modeling and Simulation I**

Osgoode Ballroom East

### **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.

### **Prediction of Localization and Failure in Thermomechanical Forming Simulation**

G. Bergman, D. Berglund, Gestamp HardTech AB

## **13:20–14:20 | Process Design I**

Osgoode Ballroom West

### **Mechanical Link Servo Press for Improved Hot Forming Capability**

T. Maki, Amino North America Corp., St. Thomas; M. Amino, Amino Corp., Fujinomiya

### **Production Control and Optimization of Hot Stamping Line**

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

### **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

### **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, 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 | Tribology I**

Osgoode Ballroom West

### **Parameters Influencing Adhesive Wear Behavior Within Hot Stamping Operations**

M. Wieland, M. Merklein, Institute of Manufacturing Technology, Friedrich-Alexander University of Erlangen-Nuremberg

### **Tribological Studies of Hot Work Tool Steel and Coated Boron Steel Using a Simulative Tribometer and Field Tests**

S. Mozgovoy, S. Hernandez, J. Hardell, B. Prakash, Luleå University of Technology; J. Pujante, M. Vilaseca, G. Ramirez, D. Casellas, Fundació CTM Centre Tecnologic

### **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.

## **14:20–15:20 | Tutorial**

Linden Room

### **PHS Process Monitoring – Skills and Methods for Professionals**

Prof. Dr. Kurt Steinhoff, Chair of Metal Forming Technology, University of Kassel

15:20–15:40

**Refreshment Break** Main Exhibit Area

## **15:40–17:00 | Product Properties**

Osgoode Ballroom East

### **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, A. Pichler, T. Kurz, voestalpine Stahl GmbH; J. Naito, Kobe Steel Ltd., Mechanical Engineering Research Laboratory; 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 of Wuhan Iron and Steel Corp.

## **15:40–17:00 | Heating and Cooling I**

Osgoode Ballroom West

### **Experimental Measurements of the Dynamics of Austenitization and Evolution of the Al-Si Coating of 22MnB<sub>5</sub> 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**

07:30–08:15

**Author Breakfast**

08:20–10:00 | **Coatings II\***

*Osgoode Ballroom East*

**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*

**Unlocking the Potential of Zinc-Coated Steel for Hot Forming by Innovative Process Modifications**

*G. Hensen, P. Beentjes, M. Abspoel, Tata Steel*

**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 Galvannealed Coating During Hot Stamping Heating Process**

*A. Sengoku, Steel Research Laboratories, Nippon Steel & Sumitomo Metal Corp.; H. Takebayashi, Nagoya R & D Lab, Nippon Steel & Sumitomo Metal Corp.*

**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*

08:20–10:00 | **Press-Hardening Steel I**

*Osgoode Ballroom West*

**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, Colorado School of Mines*

**The Origin of Hematite Blades or “Red Oxide” on Bare Press-Hardening Steels**

*L. Garza-Martinez, R. Comstock, AK Steel Middletown*

**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*

**A New Invention of Zn-Coatable Ultra-Ductile Press-Hardened Steel Achieving Strength of 1,300 MPa Combined With 28% Elongation in Hot Stamped Parts**

*H.L. Yi, P.J. Du, RAL, Northeastern University China; B.G. Wang, Easyforming Steel Technology Co. Ltd.*

10:00–10:20

**Refreshment Break** *Main Exhibit Area*

10:20–12:00 | **Process Design II**

*Osgoode Ballroom East*

**General Motors’ Global PHS Process Control Requirements and Audit Findings**

*P. Belanger, R. Labrie, A. Pearson, General Motors Co.*

**Intelligent Process Control in Press Hardening**

*W-G. Drossel, N. Pierschel, J. Schönherr, S. Polster, U. Priber, F. Schieck, S. Berndt, Fraunhofer Institute for Machine Tools and Forming Technology IWU; M. Alsmann, Volkswagen AG*

**Deep Drawing Technique With Temperature Distribution Control for Hot Stamping Process**

*E. Ota, Y. Yogo, N. Iwata, Toyota Central R&D Labs 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&TAB*

10:20–12:00 | **Modeling and Simulation II**

*Osgoode Ballroom West*

**Artificial Neural Network (ANN)-Based Microstructure Modeling of 22MnB<sub>5</sub> Boron Steel During Tailored Quenching in Hot Stamping Process**

*P. Chokshi, D. Hughes, R. Dashwood, WMG, University of Warwick; D. Norman, I. McGregor, Tata Steel Automotive Engineering Group, IARC Building, University of Warwick*

**Material Characterization and Numerical Modeling of a Hot Stamping Process With Tailor Heated Blanks**

*B-A. Behrens, A. Bouguecha, J. Moritz, C-M. Gaebel, J. Schrödter, Institute of Forming Technology and Machines, Leibniz University of Hanover*



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## **A Thermo-Plastic-Martensite Transformation Coupled Constitutive Model for Springback Prediction in Hot Stamping**

*B. Zhu, Y. Liu, W. Liang, L. Wang, Y. Wang, Y. Zhang, State Key Laboratory of Materials Processing and Die and Mould Technology, Huazhong University of Science and Technology*

## **Developments of Experimental Platform and Finite Element Model for Hot Stamping Processes**

*C. Hung, Department of Mechanical Engineering, National Chiao Tung University; T-Z. Hung, H-K. Tsai, F-K. Chen, Department of Mechanical Engineering, 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 | Modeling and Simulation II**

*Osgoode Ballroom East*

### **Influence of Short Austenitization Treatments on the Mechanical Properties of Low-Alloy Boron Steel**

*M.J. Holzweißig, A. Andreiev, M. Schaper, University of Paderborn, Materials Science; J. Lackmann, S. Konrad, C. Rüsing, Benteler Automotive, Research and Development; T. Niendorf, TU Freiberg, Institute of Materials Science*

### **Incomplete Austenitization of Patched Blanks in Hot Forming Die Quenching**

*K. Jhaji, K. Daun, University of Waterloo; S. Slezak, Formet Industries*

### **Bake Hardening Analysis of 22MnB<sub>5</sub> 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*

### **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, M.P. Pereira, B.F. Rolfe, Deakin University; X. Chen, N. Xiao, Chinese Academy of Sciences; X. Chen, Hunan University*

## **14:20–15:20 | Heating and Cooling III**

*Osgoode Ballroom East*

### **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, A. Seto, Nippon Steel & Sumitomo Metal Corp., Amagasaki; H. Fukuchi, Nippon Steel & Sumitomo Metal Corp., Futtsu*

### **Characterization of the Interface Heat Transfer Properties in the Hot Stamping Process**

*F-K. Chen, T-H. Hung, P-W. Tsai, C-K. Liu, Department of Mechanical Engineering, National Taiwan University; T-B. Huang, Department of Mechanical and Computer Aided Engineering, 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*

### **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 & 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 and Mould Technology, Huazhong University of Science and Technology*

## **14:20–15:20 | Tutorial**

*Linden Room*

### **Simulation Methods for Press-Hardening Applications**

*Prof. Dr. Mats Oldenburg, Luleå University of Technology*

15:20–15:40

**Refreshment Break** Main Exhibit Area

## **15:40–17:00 | Cutting and Trimming**

*Osgoode Ballroom East*

### **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 Ultra High-Strength Press-Hardened Steels**

S. Vogt, F. Schneider, A. Weisheit, Fraunhofer-Institute for Laser Technology ILT

**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 Tecnològic

**Hot-Half Trimming and Subsequent Mechanical Trimming of a Hot Stamped Center Pillar**

B-M. Kim, D-C. Ko, Pusan National University; P-K. Seo, K-W. Won, Shin Young Co. Ltd.

**15:40–17:00 | Tool Steel**

Osgoode Ballroom West

**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. Schruoff, I. Kind & Co.

**Evaluation of Sheared Surface Characteristics According to Tool Steel in a Hard Cutting Process**

S. Cha, J. Nam, M. Ahn, P. Seo, K. Won, Stamping Tool Engineering; B. Kim, Pusan National University

**Role of Tool Material in the Interfacial Problematics of Tool/Blank in Press-Hardening Process**

A. Hamasaiid, I. Valls, Rovalma S.A.

18:00

**CHS<sup>2</sup> Dinner** Sheraton Hotel

**WEDNESDAY, 3 JUNE 2015**

**08:20–10:00 | Coatings III\***

Osgoode Ballroom East

**Corrosion Performance of Aluminized Steel With ZnO Coating on The Surface**

S. Fujita, J. Maki, S. Yamanaka, H. Irikawa, M. Kurosaki, Yawata R&D Lab, 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

**Microstructural Evolution of the 55 wt. % Al-Zn Coating During Press Hardening**

C.W. Lee, B.C. De Cooman, GIFT, Pohang University of Science and Technology (Postech); Y.C. Cho, POSCO

**Nanoparticle Coatings: Oxidation Protection During Press Hardening**

B. Tigges, S. Benfer, M. Yekehtaz, W. Fürbeth, Dechema Forschungsinstitut; A. Tenié, W. Bleck, Steel Institute, RWTH Aachen University

**Coating Preparation for Hot Stamping Boron Steel by Pack Cementation Aluminizing**

Y. Liu, B. Zhu, Y. Zhang, State Key Laboratory of Materials Processing and Die and Mould Technology, Huazhong University of Science & Technology; Q. Zhan, H. Yang, X. Yuan, Department of Reactor Engineering Research and Design, China Institute of Atomic Energy

**08:20–10:00 | Press Hardening Steel II**

Osgoode Ballroom West

**Development of a 1.8-GPa Martensitic Stainless Steel for Hot Stamping Application**

G. Badinier, P-O. Santacreu, J-D. Mithieux, Aperam Research Center; J-M. Herbelin, Aperam Customer Team Auto

**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 China; B.G. Wang, Easyforming Steel Technology Co. Ltd.

**Next-Generation Press-Hardened Steel Material for Integral Welded Body Applications**

M. Lui, X. Xiong, J. Wang, General Motors Co., China Science Lab; Y. Shi, Pan Asia Technical Automotive Center Co.; P. Belanger, General Motors Co., Warren Tech Center

**Challenges and Successes on Manufacturing Hot Press-Hardening Steels at CSP<sup>®</sup> Mills**

W. Sun, J. Smiley, Nucor Corp.; N. Gao, D. Liu, Teck Metals Ltd.

**Quenching and Partitioning (Q&P) Die Quenching Processing of 30MnSiCrB<sub>6</sub> Press-Hardening Steel**

E.J. Seo, L. Cho, B.C. De Cooman, Pohang University of Science and Technology (Postech)

10:00–10:20

**Refreshment Break** Main Exhibit Area

**10:20–12:00 | Tailored Properties V**

Osgoode Ballroom East

**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. Garcia, A. Rautenstrauch, V. Kräusel, Technische Universität Chemnitz; A. Mosel, D. Landgrebe, Fraunhofer Institute for Machine Tools and Forming Technology IWU

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## **New Flexible Manufacturing Concepts for Mass Production of Press-Hardened Tailored Property Parts Using a Step-Chain Furnace Concept**

*T. Orth, T. Dopler, Aichelin GmbH; D. Hartmann, R. Kelsch, voestalpine Polynorm GmbH & Co KG; B. Schütt, BSN Thermprozessechnik*

## **The Mechanical and Microstructural Properties of Tailored Hot Stampings Due to In-Die Heating up to 700°C**

*A. Baldecik, Y. Prajogo, M. Worswick, Department of Mechanical and Mechatronics Engineering, University of Waterloo*

## **10:20–12:00 | Modeling and Simulation III**

*Osgoode Ballroom West*

### **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*

### **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*

### **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 Hanover*

### **From Concept to Virtual Reality — Virtual Hot Forming Engineering Illustrated**

*H. Porzner, D. Lorenz, M. Holecek, M. Vrolijk, M. Hoss, B. Damenha, J. Friberg, ESI Group; C. Koroschetz, M. Skrikerud, AP&T*

**12:00–13:20**

**Lunch** *Main Exhibit Area*

## **13:20–14:30 | Tribology II**

*Osgoode Ballroom East*

### **Adhesion Behavior of Aluminum for Aluminum-Coated 22MnB<sub>5</sub> Steel in Hot Stamping Under Dry and Lubricated Conditions**

*K. Uda, Research & Development Department, Daido Chemical Industry Co. Ltd.; A. Azushima, Dept. of Mechanical Engineering, Graduate School of Engineering, Yokohama, National University*

### **Simulative High-Temperature Friction and Wear Studies for Press-Hardening Applications**

*S. Mozgovoy, J. Hardell, M. Oldenburg, B. Prakash, Division of Machine Elements, Luleå University of Technology; L. Deng, Division of Mechanics of Solid Materials, Luleå University of Technology*

### **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*

## **13:20–14:30 | Various Topics**

*Osgoode Ballroom West*

### **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 Nondestructive Testing – IZFP*

### **Magnet Pulse Welding — A Review on Joining of Aluminum and High-Performance Steel**

*A. Rebensdorf, S. Böhm, Department for Cutting and Joining, Institute for Production Technologies and Logistics, University of Kassel*

**14:30**

## **Closing Session**

*\*Joint sessions with Galvatech (A6 and A11)*