23rd IFHTSE Congress

April 18-21, 2016

Hyatt Regency

Savannah, Georgia

Organized by:

IFHTSE

Heat Treating Society

ASM International
Introducing

SimpliMet™ 4000

The fastest mounting press, ideal for 24/7 production.

• Duplex mounting press eliminates bottlenecks.
• Consistently transforms cut samples to specimens ready for grinding and polishing.
• Equipped with a Smartcool™ cooling system and an intuitive interface that stores settings and shortens setup time.
• Durable, compact and easy to use.

Wilson® VH3300

The VH3300 offers precision, repetition accuracy and user friendliness in production and quality control environments.

DiaMet™ Software

Optimized for Macro and Micro Vickers and Knoop evaluations.

PlanarMet™ 300

Bench-top planar grinder with fast grinding, programmable grinding depth and a durable grinding stone.
GENERAL INFORMATION

ABOUT THE EVENT:
The ASM Heat Treating Society and the International Federation of Heat Treatment and Surface Engineering have partnered to create an exciting event focused on Thermal Processing, Heat Treating and Surface Engineering. This event will bring together international experts from around the globe to present the latest innovations and research in Thermal Processing and Surface Engineering. Thermal Processing is a critical step in bringing goods to market. Historically it has encompassed only heat treating ferrous and non-ferrous alloys. However, with new advances in composites, additive manufacturing, tribology and surface engineering, the science and art of thermal processing has taken on a vital importance to the high performance requirements of performance, cost and quality.

REGISTRATION SCHEDULE

<table>
<thead>
<tr>
<th>Day/Date</th>
<th>Hours</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, April 18, 2016</td>
<td>2:00–6:30 p.m.</td>
<td>Regency Ballroom Foyer, 2nd Floor</td>
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<tr>
<td>Tuesday, April 19, 2016</td>
<td>7:00 a.m.–5:30 p.m.</td>
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<tr>
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<tr>
<td>Thursday, April 21, 2016</td>
<td>7:00 a.m.–12:00 p.m.</td>
<td>Regency Ballroom Foyer, 2nd Floor</td>
</tr>
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</table>

EXHIBIT DATES AND TIMES
Location: Regency Ballroom A

Monday, April 18
Welcome Reception: 5:30–7:00 p.m.

Tuesday, April 19
Morning Refreshment Break: 10:40–11:00 a.m.
Lunch: 12:00–1:30 p.m.
Afternoon Refreshment Break: 3:10–3:30 p.m.

Wednesday, April 20
Morning Refreshment Break: 10:10–10:30 a.m.
Lunch: 12:30–1:30 p.m.

SESSION CHAIRS
REMINDER: Session Chairs should pick up their packets at the IFHTSE Congress Registration Desk in the Regency Ballroom Foyer.

SPEAKERS
REMINDER: All speakers should plan to meet in the room of your presentation 30 minutes prior to the start of your session in order to upload your presentation. This will allow all speakers the opportunity to meet their session chair and go over any final conference details and any audio visual concerns.

POLICY ON AUDIO AND VIDEO RECORDING OF TECHNICAL PAPER PRESENTATIONS/SESSIONS
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POLICY OF CELLULAR PHONE USAGE
In consideration of fellow event attendees and presenters, show management kindly requests your cooperation in minimizing disturbances which may occur during technical sessions. We ask that cellular phones or other electronic devices be placed in “silent mode” while you are in the meeting rooms. Please step outside the meeting room if you need to have a conversation.

PROCEEDINGS
Each full conference registrant will receive online access to the manuscripts. You should have received an email with a link to the proceedings and instructions on how to access them.

SOCIAL MEDIA
Follow us on Twitter @asminternatnl and share your conference highlights with #ifhtse16.
ORGANIZING COMMITTEE

General Chairman: Dr. D. Scott MacKenzie, FASM, Houghton International Inc.

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Mr. Rob Goldstein, Fluxtrol, Inc.
Dr. Christian Moreau, Concordia University
Dr. George Totten, Totten & Associates
Dr. Rick Sisson, WPI
Dr. Erhan Uluv, Acuren, Inc.
Mr. David Guisbert, Guisbert & Associates
Dr. Stefan Hock, General Secretary, IFHTSE
Dr. Lynn Ferguson, Dante-Solutions, Inc.
Dr. Rozalia Papp, Air Liquide
Mr. Andy Banka, AirFlow Sciences
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Prof. Arvind Agarwal, Florida University

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Prof. Lauralice Canale
Dr. Sabine Denis, Henri Poincare University, LSG2M
Dr. Imre Felde
Dr. Kiyoshi Funatani, IMST
Prof. Jianfeng Gu, Shanghai Jiao Tong University
Dr. Patrick Jacquot, Bodycote Belgium
Prof. Young-Kook Lee
Prof. Thomas Luebben
Prof. Rosa Otero, Universidade de Sao Paulo
Prof. Schneider Reinhold, TU Upper Austria Wels
Prof. Y.M. Rong
Prof. Bozo Smoljan
Ms. Eva Troell, Swerea
Mr. Ole West
Prof. Hans-Werner Zoch, IWT
KEYNOTE SPEAKERS

PROF. H. K. D, H. BHADESHIA
Dept of Materials Science and Metallurgy, University of Cambridge
Very Short and Very Long Heat-Treatments in the Processing of Steel
Tuesday, April 19, 2016, 9:00 a.m.

Harry Bhadeshia is the TATA Steel Professor of Metallurgy at the University of Cambridge. His research is concerned with the theory of solid-state transformations in metals, particularly multicomponent steels, with the goal of creating novel alloys and processes with the minimum use of resources. He is the author or coauthor of more than 600 research papers and six books on the subject. He is a Fellow of the Royal Society, Fellow of the Royal Academy of Engineering, the National Academy of Engineering (India) and the American Welding Society.

MR. TOBIAS STEINER
Alloying Element Nitride Development in Ferritic Fe-based Materials upon Nitriding
Tuesday, April 19, 2016, 10:00 a.m.

Tobias Steiner studied materials science at the University of Stuttgart from 2007 to 2012. He made his diploma thesis in 2012 in the department of Prof. Mittemeijer on the topic “Nitriding of Ti and Ti-Al alloys”. Since 2012 he is working on his PhD thesis on the topic “Internal precipitation of nitrides in Iron-based alloys” in the department of Prof. Mittemeijer at the Max Planck Institute for Intelligent Systems. His research is mainly focused on the nitriding behavior of ternary Fe-Cr-Mo alloys and the evolution of the XRD peak shape upon nitriding of ferritic alloys. Beginning from December 2015 he is working as a materials expert for stainless steels at Robert Bosch GmbH in the department GS/ECC-FA. He can be contacted at tobias.steiner2@de.bosch.com

PROF. DR.-ING. HABIL. ROLF ZENKER
Zenker Consult Mittweida
Surface Treatment by Electron Beam in Combination with Other Heat Treatment Technologies
Tuesday, April 19, 2016, 11:00 a.m.

VITA
1965–1972 studies (Technical University (TU) Karl-Marx-Stadt)
1972–1977 Scientific Assistant (TU Karl-Marx-Stadt)
1975 Dr.-Ing. graduation (TU Karl-Marx-Stadt)
1978–1987 Senior Engineer (TU Karl-Marx-Stadt)
1984 Facultas Docendi (Technical University Karl-Marx-Stadt)
1986 Postdoctoral lecture qualification (TU Bergakademie Freiberg)
1987–1999 Department Manager in different companies
1999–2002 Managing Director
1990–2002 Associate Professor at different University (Chemnitz, Freiberg, Erlangen, Mittweida)
Since 2003 Honorary Professor at TU Bergakademie Freiberg
Managing Director of Zenker-Consult Mittweida
<table>
<thead>
<tr>
<th>Date &amp; Time</th>
<th>Event</th>
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<tbody>
<tr>
<td><strong>Monday, April 18, 2016</strong></td>
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<tr>
<td>8:30 a.m.–6:00 p.m.</td>
<td>HTS Board Meeting (Invited)</td>
<td>Plimsoll Room</td>
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<tr>
<td>9:00 a.m.–12:00 p.m.</td>
<td>IFHTSE Executive Committee Meeting (Invited)</td>
<td>Savannah Room</td>
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<tr>
<td>2:00–6:30 p.m.</td>
<td>Conference Registration Open</td>
<td>Regency Ballroom Foyer</td>
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<tr>
<td>3:30–5:30 p.m.</td>
<td>Exhibitor Set-up</td>
<td>Regency Ballroom A</td>
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<tr>
<td>2:30–3:30 p.m.</td>
<td>Tom Bell Award Judging (Invited)</td>
<td>Westbrook Room</td>
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<tr>
<td>4:00–5:00 p.m.</td>
<td>IFHTSE General Assembly Meeting</td>
<td>Savannah Room</td>
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<tr>
<td>5:30–7:00 p.m.</td>
<td>Welcome Reception with Exhibitors</td>
<td>Regency Ballroom A</td>
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<tr>
<td>7:00–9:00 p.m.</td>
<td>HTS Technology and Programming Committee Meeting (Invited)</td>
<td>Offsite</td>
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<tr>
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<tr>
<td>7:30–8:30 a.m.</td>
<td>Continental Breakfast</td>
<td>Regency Ballroom Foyer</td>
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<tr>
<td>9:00–10:40 a.m.</td>
<td>Keynote Address I</td>
<td>Regency Ballroom DEF</td>
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<tr>
<td>10:40–11:00 a.m.</td>
<td>Morning Refreshment Break with Exhibitors</td>
<td>Regency Ballroom A</td>
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<tr>
<td>11:00 a.m.–12:00 p.m.</td>
<td>Keynote Address II</td>
<td>Regency Ballroom DEF</td>
</tr>
<tr>
<td>Noon–1:30 p.m.</td>
<td>Networking Lunch with Exhibitors</td>
<td>Regency Ballroom A</td>
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<tr>
<td>1:30–3:10 p.m.</td>
<td>Technical Programming</td>
<td>Regency Ballroom A</td>
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<tr>
<td>3:10–3:30 p.m.</td>
<td>Refreshment Break</td>
<td>Regency Ballroom A</td>
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<tr>
<td>3:30–5:30 p.m.</td>
<td>Technical Programming</td>
<td>Regency Ballroom B, C, DEF</td>
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<tr>
<td>6:30 p.m.</td>
<td>Offsite - Savannah Riverboat Cruise*</td>
<td>See page 7 for details</td>
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<tr>
<td><strong>Wednesday, April 20, 2016</strong></td>
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<td>Technical Programming</td>
<td>Regency Ballroom A</td>
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<tr>
<td>10:45 a.m.–1:30 p.m.</td>
<td>Spouse/Guest Program - Savannah Trolley Tour with Lunch*</td>
<td>See page 7 for details</td>
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<tr>
<td>12:30–1:30 p.m.</td>
<td>Networking Lunch with Exhibitors</td>
<td>Regency Ballroom A</td>
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<tr>
<td>1:30–3:10 p.m.</td>
<td>Technical Programming</td>
<td>Regency Ballroom B, C, DEF</td>
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<tr>
<td>1:30–3:30 p.m.</td>
<td>Exhibitor Tear Down</td>
<td>Regency Ballroom A</td>
</tr>
<tr>
<td>3:10–3:30 p.m.</td>
<td>Refreshment Break</td>
<td>Regency Ballroom A</td>
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<tr>
<td>3:30–5:30 p.m.</td>
<td>Technical Programming</td>
<td>Regency Ballroom B, C, DEF</td>
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<tr>
<td>6:00–6:30 p.m.</td>
<td>Networking Reception</td>
<td>Harborside Center</td>
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<td>6:30–8:30 p.m.</td>
<td>Networking Dinner and The Linde Group Poster Award</td>
<td>Harborside Center</td>
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<td>Technical Programming</td>
<td>Regency Ballroom B, C, DEF</td>
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<tr>
<td>12:30–1:30 p.m.</td>
<td>Lunch and Closing Session: Residual Stress Panel Discussion</td>
<td>Regency Ballroom A</td>
</tr>
<tr>
<td>1:30–1:45 p.m.</td>
<td>Closing Remarks and Awards Presentation: Tom Bell Young Author Award</td>
<td>Regency Ballroom A</td>
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<tr>
<td>2:00 p.m.</td>
<td>Conference Concludes</td>
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</tbody>
</table>

*Additional Fee, not included with conference registration*
RESIDUAL STRESS SYMPOSIUM
This special symposium will provide an overview of the current state of the art for residual stress prediction, measurement and control in industry. Presentations will be given by major aerospace OEMs and experts in the field of residual stress modeling and measurement. Please see technical program for specific schedule of sessions.

WELCOME RECEPTION WITH EXHIBITORS
Monday, April 18, 2016, 5:30–7:00 p.m.
Regency Ballroom A
Included with Registration
Relax, meet with exhibitors and enjoy light appetizers and drinks during this year’s Welcome Reception. Conference attendees receive two drink tickets. Cash bar thereafter.
Sponsored by:

SAVANNAH RIVERBOAT CRUISE
Tuesday, April 19, 2016
Boarding: 6:30 p.m.
Sailing Time: 7:00 p.m.
Return: 9:00 p.m
Tickets: $85.00 each (pre-registration required)
Don’t miss this exciting night aboard the Savannah Riverboat Cruise with delicious buffet dinner featuring local cuisine. You can venture onto the top deck and capture an amazing evening view of one of the most famous waterfronts in the USA.
To get to the boat: From the lobby level take the Harborside elevators down one level to river street. Proceed to walk out the glass doors and take a left. Walk about 10 feet and take another left, the boats will be right in front of you.

NETWORKING RECEPTION AND DINNER
Wednesday, April 20, 2016
6:00–8:30 p.m.
Hyatt Regency Savannah
One ticket included with registration.
Additional tickets are $70.00 each
Enjoy a night with friends and colleagues at the IFHTSE 2016 Dinner Reception.

SPOUSE PROGRAM
Wednesday, April 20, 2016
10:45 a.m.–1:30 p.m.
Tickets: $75.00 each (pre-registration required)
View beautiful Downtown Savannah on this 90 minute guided history trolley tour and enjoy lunch at The Lady & Sons. Includes on/off trolley access after tour for the rest of the day. The trolley will pick you up in the front driveway of the Hyatt on W Bay Street.
TECHNICAL PROGRAM

TUESDAY, APRIL 19, 2016

7:30–8:30 a.m.
Continental Breakfast in Regency Ballroom Foyer

Keynote I
8:45–10:40 a.m.
Meeting Room: Regency Ballroom DEF
Session Chair: Scott MacKenzie
Session Chair: Patrick Jacquot
8:45 a.m.
Opening Remarks
9:00 a.m.
Very Short and Very Long Heat-Treatments in the Processing of Steel: Prof. H. K. D. H. Bhadeshia, Dept of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom
10:00 a.m.
Alloying Element Nitride Development in Derritic Fe-Based Materials Upon Nitriding: Mr. Tobias Steiner and Prof. Eric J. Mittemeijer, Max-Planck Institute for Intelligent Systems (formerly Metals Research), Stuttgart, Germany
10:40–11:00 a.m.
Networking Break with Exhibitors
Meeting Room: Regency Ballroom A

Keynote II
11:00 a.m.–12:00 p.m.
Meeting Room: Regency Ballroom DEF
Session Chair: Scott MacKenzie
Session Chair: Patrick Jacquot
11:00 a.m.
Surface Treatment by Electron Beam in Combination With Other Heat Treatment Technologies: Prof. Rolf Zenker and Mrs. Gundis Grumbl, Zener Consult, Mittweida, Germany, Institute of Materials Engineering, TU Bergakademie Freiberg, Freiberg, Germany
12:00–1:30 p.m.
Lunch with Exhibitors
Meeting Room: Regency Ballroom A

Nitriding I
1:30–2:30 p.m.
Meeting Room: Regency Ballroom DEF
Session Chair: Patrick Jacquot
Session Chair: Vojteh Leskovsek
1:30 p.m.
The Effects of Process Parameters on Nitrogen Infiltration and the Controlling of Nitrogen Concentration in Vacuum Nitriding: Dr. Masahiro Okumiya, Dr. Yoshiki Tsunekawa, Dr. Jung-Hyun Kong and Dr. Sang-gweon Kim, Toyota Technological Institute, Nagoya, Japan, Heat treatment Group, KITECH, Incheon, South Korea
1:50 p.m.
Gas Phase Deep Nitriding of 33Crmov12-9 Steel: A Microstructural Characterization of the Precipitates: Mr. Olivier Skiba, Jacky Dulcy, Grégory Marcos, Alice Courleux and Thierry Czerwiec, Hispano-Suiza, Colombes, France, Institut Jean Lamour (UMR 7198) CNRS, Nancy, France
2:10 p.m.
Effect of Plasma Nitriding on Corrosion Behaviour of AISI 4330 Low Alloy Steel: Mr. Vinaykumar Bapuso Patil, R&D, Bharat Forge Limited, Pune, India
3:10–3:30 p.m.
Networking Break with Exhibitors
Meeting Room: Regency Ballroom A

Quenching and Quenchants I
3:30–5:30 p.m.
Meeting Room: Regency Ballroom DEF
Session Chair: Lynn Ferguson
Session Chair: Thomas Luebben
3:30 p.m.
Press Quench Process Design for a Bevel Gear using Computer Modeling: Dr. Zhichao (Charlie) Li, Mr. Andrew M Freborg and Dr. B. Lynn Ferguson, DANTE Solutions, Inc., Cleveland, Ohio

IFHTSE_Final Program.indd   8
4/8/2016   10:09:02 AM
3:50 p.m.
Intensive Quenching of AISI 5160 Spring Steel Using Small Scale Laboratory Equipment: A Progress Report: Dr. George E. Totten1, Mr. Luigi Leonardo Mazzuccho Albanò2, João Gilberto Lucio3, Fernando S. Misina4, Vojteh Leskovsek4 and Dr. Lauralice de C. F. Canale5, 1 Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon, 2 Department of Materials Engineering, University of SÃ£o Paulo, SÃ£o Carlos/SP, Brazil, 3 Rassini NHK, SÃ£o Bernardo do Campo, Brazil, 4 University of Ljubljana, Ljubljana, Slovenia

4:10 p.m.
Maximizing Quenching in Vacuum Heat Treating: Mr. Thomas Wingens, WINGENS International Industry Consultancy, Sewickley, Pennsylvania

4:30 p.m.
Online Selection of Quenchant Cooling Heat Exchanger: Mr. Gary Berwick and Mr. Matt Reed, Dry Coolers Inc., Oxford, Michigan

4:50 p.m.
Ionic Liquids for Immersion Quenching of Aluminium Alloys: Mr. Martin Beck1, Mrs. Christin Neise1, Dr. Michael Reich1, Dr. Mathias Ahrenberg1, Prof. Christoph Schick1, Prof. Udo Kragl1 and Prof. Olaf Keßler1, 1 University of Rostock, Rostock, Germany, 2 Institut für Physik, University of Rostock, Rostock, Germany, 3 Institut für Chemie, University of Rostock, Rostock, Germany, 4 Chair of Materials Science, University of Rostock, Rostock, Germany

5:10 p.m.

4:10 p.m.
Effect of Microstructure on the Fatigue Crack Growth Behaviour in Low Carbon Steel: Mr. Daisuke Watanuki1, Dr. Hangyue Li2 and Prof. Paul Bowen3, 1 Basic Technology Research Center, NSK Ltd., Kanagawa, Japan, 2 Metallurgy & Materials, University of Birmingham, Birmingham, United Kingdom

4:30 p.m.

4:50 p.m.
Formulae For Safe Design Against Fatigue Failures: Mr. Nori VSN Murthy, Independent Research Scientist, None, India

5:10 p.m.

WEDNESDAY, APRIL 20, 2016

7:30–8:30 a.m.
Continental Breakfast in Ballroom Foyer

Advanced Thermal Processing I
8:30–10:10 a.m.
Meeting Room: Regency Ballroom C

Session Chair: Valery Rudnev
Session Chair: Michael Pershing

8:30 a.m.
Design of Advanced Tempering Diagrams of Tool Steels Using Multifunctional CNPTB Specimen: Prof. Bojan Podgornik1, Mr. Gašper Puš2, Dr. Vojteh Leskovsek1 and Dr. Matjaž Godec1, 1 Materials testing, Institute of Metals and Technology, Ljubljana, Slovenia, 2 University Nova Gorica, Nova Gorica, Slovenia, 3 Heat Treatment and Surface Engineering Department, Institute of Metals and Technology, Ljubljana, Slovenia

8:50 a.m.
Microstructural Evolution in Microalloyed Steels during High-Speed Thermomechanical Bar and Rod Rolling: Prof. Robert Cryderman, Mr. Blake Whitely and Dr. John G. Speer, George S. Ansell Dept. of Metallurgical and Materials Engineering, Colorado School of Mines, Golden, Colorado
9:10 a.m.
Hot Hydroforming of Lightweight Bimaterial Gears and Hollow Products: Dr. Bulent Chavdar, Mr. Robert C. Goldstein and Dr. B. Lynn Ferguson,
1Corporate Research and Technology, Eaton, Southfield, Michigan, 2Fluxtrol Incorporated, Auburn Hills, Michigan, 3DANTE Solutions, Inc, Cleveland, Ohio

9:30 a.m.
Effect of processing Route on Microstructure and Impact Toughness of Duplex Stainless Steel: Mr. Amit Powar, Mr. Amol Gujar, Mr. Niketan Manthani, Mr. Vinayak Pawar and Dr. Rajkumar P Singh, Kalyani Centre for Technology & Innovation, Bharat Forge Ltd., Pune, India

9:50 a.m.
Effect of Electron Beam Welding on Microstructure and Mechanical Properties of Ti-6Al-4V Alloy: Mr. Sandeep Thakare, Dr. N prabhu, Mr. Prakash Kattire and Dr. RKP Singh, IIT Bombay, mumbai, India, 3Research and development, KCTI, Bharat forge Ltd. Pune, India, Pune, India, 4Research and development, Bharat forge Ltd., Pune, India

10:10 a.m.
Cryogenic (NDT)—Transition Detection/Phase Transformation: Mr. Victor Sloan, Victor Aviation Service, Inc, Palo Alto, California

Session Chair: Rozalia Papp

8:30 a.m.
The Sub-Zero Celsius Treatment of Stainless Steels: Experiments and Perspective: Dr. Matteo Villa, Dr. Thomas Christiansen and Prof. Marcel A.J. Somers, Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark

8:50 a.m.
Integrating Cryogenic Treatment With Nitro-Carburizing to Improve Performance of Aisi H-13 Tool Steel: Mr. Valmik Bhavar, Mr. Shreyans Khot, Mr. Prakash Kattire and Dr. RKP Singh, Research and development, KCTI, Bharat forge Ltd. Pune, India, Pune, India

9:10 a.m.
Cryogenic Processing

Meeting Room: Regency Ballroom B

Session Chair: Michael Hill

Session Chair: Dale Ball

8:30 a.m.
An Overview of the Analysis of Bulk Residual Stresses in Aerospace Components: Dr. Rollie Dutton, Manufacturing and Industrial Technologies Division, Air Force Research Laboratory, Wright-Patterson AFB, Ohio

8:50 a.m.
The Evolution of Bulk Residual Stress and Distortion Modeling Under the Metals Affordability Initiative: Dr. M. G. Glavicic, Rolls-Royce Corporation, Indianapolis, Indiana

9:30 a.m.
Process Induced Distortion and Residual Stresses in Aerospace Parts: Mr. James B. Castle, Boeing Research and Technology, The Boeing Company, Saint Louis, Missouri

10:10 a.m.
Networking Break with Exhibitors

Meeting Room: Regency Ballroom A

Advanced Thermal Processing II—High Energy Processes

Meeting Room: Regency Ballroom C

Session Chair: Robert Goldstein

Session Chair: Robert Cryderman

10:30 a.m.
INDUCTION HARDENING OF SHAFTS AND SHAFT-LIKE COMPONENTS: Dr. Valery Rudnev, William West, Aaron Goodwin and Steve Fillip, 32251 N.Avis Dr., Inductoheat, Madison Heights, Michigan

10:50 a.m.
Effects of the Inductive Hardening Process on the Martensitic Structure of a 50CrMo4 steel: Ms. Annika Vieweg, Gerald Ressel, Petri Prevedel, Stefan Marsoner and Reinhold Ebner, Materials Center Leoben Forschung GmbH, Leoben, Austria

11:10 a.m.
Minimizing Case/Core Initiated Failures in Induction Hardened Components: Mr. Michael A. Pershing, Mr. Gary Raab and Mr. Weizhou Li, Caterpillar Inc., East Peoria, Illinois

11:30 a.m.
Induction Camshaft Hardening Technology With Practically Undetectable Distortion: Gary Doyon, Dr. Valery Rudnev, John Maher, Randy Minnick and Glen Desmier, 32251 N.Avis Dr., Inductoheat, Madison Heights, Michigan
11:50 p.m.
Local Hardening of Ductile Cast Iron—The Importance of Temperature: Mr. David A Guisbert, QA Metallurgical Services LLC, Niles, Michigan

12:10 a.m.
Effect of the Surface Morphology And Surface Finish on the Corrosion Resistance of Heat Treated Ti6Al4V Via Direct Metal Laser Sintering: Ms. Yangzi Xu, Mr. Yuan Lu, Prof. Jianyu Liang, 1Worcester Polytechnic Institute, Worcester, Massachusetts, 2Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts

Materials Characterization I
10:30 a.m.—12:30 p.m.
Meeting Room: Regency Ballroom B

Session Chair: David Van Aken
Session Chair: Richard Sisson

10:30 a.m.
Martensite Lattice Parameter Measured by Modern X-Ray Diffraction in Fe-C Alloy: Mr. Yuan Lu, Mr. Haixuan Yu, Ms. Xiaqing Cai, Prof. Yiming (Kevin) Rong and Prof. Richard D. Sisson, Jr., Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts

10:50 a.m.
In situ X-Ray Diffraction Investigations of Martensitic Transformation And Austenite Modifications During Quenching of Low Alloy Steels: Mr. Jeremy Epp, Foundation Institute of Materials Science, Bremen, Germany

11:10 a.m.
Hardness-Toughness Relationship of a Boron Alloyed Quench and Tempering Steel After Different Heat Treatment Cycles: Prof. Reinhold S. E. Schneider, 1Mrs. Yuri Toshima, 2Mrs. Katharina Steineder, 3and Prof. Masahiro Okumiya, 1Univ. of Appl. Sciences Upper Austria, Wels, Austria, 2Toyota Technological Institute, Nagoya, Japan

11:30 a.m.
Close Relations Between Metallic Materials, Heat Treatment and Thermochemical Treatment on the Microstructure: Contribution of Metallographic Examinations Performed on Industrial Parts Through Several Case Studies.: Mr. Patrick Jacquot, Bodycote, Pusignan, France

11:50 a.m.
Microstructural Analysis of Carbides in Steel by Electrochemical Extraction Technique: Mr. Haixuan Yu, Mr. Yuan Lu and Ms. Xiaqing Cai, 1Worcester Polytechnic Institute, Worcester, Massachusetts, 2Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts

12:10 p.m.
Study of Phase Transformations During Tempering of AISI L6 Low Alloy Tool Steel By Means of Dilatometry and High Temperature X-Ray Diffraction: Mr. Douglas Quiñones, CIDET, Universidad Autonoma de Nuevo Leon, Facultad de Ingenieria Mecanica y Electrica., San Nicolas de los Garza, Mexico

Residual Stress Symposium-Introduction II
10:30 a.m.—12:30 p.m.
Meeting Room: Regency Ballroom DEF

Session Chair: James Castle
Session Chair: Mike Glavicic

10:30 a.m.
Bulk Residual Stress Effects on Structural Fatigue —The Integrated Computational Structures Engineering (ICSE) Approach: Dr. Dale L. Ball, Lockheed Martin Aeronautics Company, Fort Worth, Texas

11:10 a.m.
The FEP Framework To Address Challenges in Residual Stress Measurement And Prediction: Mr. Vasisht Venkatesh, Pratt & Whitney, East Hartford, Connecticut

11:30 a.m.
Metals Affordability Initiative ICME related Residual Stress Modeling for Ni Disks—Material/Process Sensitivity, Distortion, and V&V: Dr. M.G. Glavicic, Mr. Robert Goetz and Mr. Kong Ma, Rolls-Royce Corporation, Indianapolis, Indiana

11:50 a.m.
Measurement of Residual Stress in Aerospace Materials: Mr. Michael R. Hill and Dr. Adrian T. DeWald, Hill Engineering, LLC, Rancho Cordova, California

12:30–1:30 p.m.
Lunch with Exhibitors
Meeting Room: Regency Ballroom A

Nitriding II
1:30–3:10 p.m.
Meeting Room: Regency Ballroom B

Session Chair: Patrick Jacquot
Session Chair: Tobias Steiner

1:30 p.m.
Low Temperature Nitriding of Strain Induced Martensite and Laser Quenched Austenite : Dr. Vojtěh Leskovský, Heat Treatment and Surface Engineering Department, Institute of Metals and Technology, Ljubljana, Slovenia

1:50 p.m.
Influence of Stress and Strain Hardening on Gaseous Nitriding: Mr. Benjamin Guillot, Dr. Sébastien Jégou and Prof. Laurent Barrallier, MSMP Laboratory, MSMP Laboratory, Arts et Métiers ParisTech, Aix-en-Provence, France, Aix-En-Provence, France
2:10 p.m.
Low Temperature Surface Hardening of Stainless Steel; The Role of Plastic Deformation: Mr. Federico Bottoli¹, Ms. Freja. N. Jespersen¹, Prof. Jesper H. Hattel¹, Prof. Grethe Winther¹, Dr. Thomas Christiansen¹ and Prof. Marcel A.J. Somers¹,
¹Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark, ²Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark

2:30 p.m.
Effects of Different Microstructural and Hardness Gradients Generated by Single and Combined Surface Treatments With a Nitriding Top Layer: Dr. Anja Buchwalder¹, Mr. Normann Klose¹, Prof. Rolf Zenker¹,², Prof. Heinz-Joachim Spies¹ and Mrs. Anne Jung¹,
¹TU Bergakademie Freiberg, Institute of Materials Engineering, Freiberg, Germany, ²Zenker Consult, Mittweida, Germany

2:50 p.m.
Optimization of Gaseous Nitriding of Steels By Multi-Physics Modeling: Prof. Laurent Barrallier¹, Dr. Sébastien Jégou¹ and Dr. Geoffrey Totten²,
¹MSMP Laboratory, MSMP Laboratory, Arts et Métiers ParisTech, Aix-en-Provence, France, ²Airbus Helicopters, Marignane, France

Quenching and Quenchants II
1:30–2:50 p.m.
Meeting Room: Regency Ballroom C

Session Chair: David Guisbert
Session Chair: Imre Felde

1:30 p.m.
Selection of Quenchants: Dr. Scott Mackenzie,
Houghton International Inc., Valley Forge, Pennsylvania

1:50 p.m.
Why Fine Filtering For Quench Oil Systems Is A Must!: Mr. Jimmy Pfaffenberger, CC Jensen, Newnan, Georgia

2:10 p.m.
The New Industry Benchmark For Pipe and Bar Quench: Mr. Pietro Della Putta¹ and Mr. Mario Fabro¹,
¹Furnaces & Heat Treatment Dept., SMS Meer S.p.A., Tarcento (UD), Italy, ²Long Products, SMS USA, LLC, Pittsburgh, Italy

2:30 p.m.
A New Probe to Measure and Evaluate the Real Quenching Intensity Based on Temperature Gradients: Prof. Bozidar Liscic¹, Prof. Bozidar Matijevic¹, Dr. George E. Totten¹ and Dr. Lauralice de C. F. Canale¹,
¹Department of Materials, Faculty for Mech. Engineering, University of Zagreb, Zagreb, Croatia, ²Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon, ³Departramento de Engenharia de Materiais – SMM, Universidade de São Paulo, São Carlos-SP, Brazil

Residual Stress Symposium I
1:30–3:10 p.m.
Meeting Room: Regency Ballroom DEF

Session Chair: Lynn Ferguson
Session Chair: Pam Kobryn

1:30 p.m.
Experiences With Residual Stress Modeling and Material Characterization in the Ba-11 Program For Aluminum Forgings: Dr. Mark A. James,
Aerospace, Alcoa, Inc., Alcoa Center, Pennsylvania

2:10 p.m.
CFD Quenching Simulation using Experimentally Determined Flow Boiling Database: Mr. Andrew L. Banka and Dr. Jeffrey D. Franklin, Airflow Sciences Corporation, Livonia, Michigan

2:50 p.m.
Distortion Potential of Cold Forming Prior to Induction Heat Treatment Processes: Mr. Dawid Nadolski¹, Dr. Alwin Schulz¹ and Prof. Hans-Werner Zoch²,
¹Heat Treatment, Stiftung Institut für Werkstofftechnik (IWT), Bremen, Germany, ²Stiftung Institut für Werkstofftechnik (IWT), Bremen, Germany

3:10–3:30 p.m.
Refreshment Break
Meeting Room: Ballroom Foyer

Coating Technology (Thermal Spray, PVD, CVD...)
3:30–4:10 p.m.
Meeting Room: Regency Ballroom B

Session Chair: Christoph Laumen
Session Chair: Rol Zenker

3:30 p.m.
Production, Examination and Application of Modern Composite Materials With Nano-Carbo Dispersion Phase: Prof. Tomasz Babul and Mrs. Anna Olbrycht, Institute of Precision Mechanics, Warsaw, Poland

3:50 p.m.
Characterizations of Alternating Current Field Enhanced Pack Aluminizing at Medium and Low Temperatures: Prof. Fei Xie¹,², Mr. Zhichao Huang¹ and Mr. Menglong Yan¹,
¹Materials Science and Engineering School, Changzhou University, Changzhou, China, ²Key Laboratory of Materials Surface Technology of Jiangsu Province, Changzhou University, Changzhou, China
Materials Characterization II
3:30–5:30 p.m.
Meeting Room: Regency Ballroom C

Session Chair: Božo Smoljan
Session Chair: Joseph Newkirk

3:30 p.m.
Hardenability Characterization and Microstructural Evolution in Heavy Gauge Plate Steels: Mr. Igor Vieira and Dr. Emmanuel De Moor, Colorado School of Mines, Golden, Colorado

3:50 p.m.
Influence of Cooling And Heating Rates on the Thermal Properties of Ni-Ti Shape Memory Alloy: Mrs. Boutheina Ben Fraj and Prof. Zoubeir TOURKI, Mechanical laboratory of Sousse, National Engineering School of Sousse, University of Sousse, Sousse, Tunisia

4:10 p.m.
Thermal Diffusivity in Cast Aluminum Alloys: Prof. Rafael Colas, Humberto Arenas-Garcia, Alma G. Esmeralda, Andrés Rodriguez and Dr. José Talamantes-Silva, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico, Research and Development, Nemak, S.A. de C.V., García, Mexico, Nemak México, S.A. de C.V., García, Mauritius

4:30 p.m.
Study of Phase Transformations During Tempering of AISI L6 Low Alloy Tool Steel by Means of Calorimetry: Mr. Douglas Quiñones, CIDET, Universidad Autónoma de Nuevo León, Facultad de Ingeniería Mecánica y Electrónica, San Nicolás de los Garza, Mexico

4:50 p.m.
Influence of UNSM Treatment Temperature on Microstructure and Mechanical Properties of Inconel 600: Mr. Jun-Hyong Kim, Mr. Hak-Doo Kim, Dr. Aezhan Amanov and Prof. Young-Sik Pyun, Mechanical Engineering, Sun Moon University, Asan, South Korea

5:10 p.m.
Influence of Heat Treatment On Fatigue and Fracture Toughness Behavior of AISI 4140 Steel: Mr. Pravin Jadhav, Prof. R.C. Prasad, Mr. Rajesh Mane, Mr. Manoj Ukhande and Mr. Suresh Arangi, Kalyani Centre for Technology and Innovation, Bharat Forge Ltd., Pune, India, Metallurgical Engineering and Material Science, Indian Institute of Technology Bombay, Mumbai, India, FTL & CAE, Bharat Forge Ltd., Pune, India, MQC, Bharat Forge Ltd., Pune, India

Residual Stress Symposium II
3:30–5:10 p.m.
Meeting Room: Regency Ballroom DEF

Session Chair: Mark James
Session Chair: Andrew Banka

3:30 p.m.
Prediction of Quench-Induced Residual Stresses in Al-Cu-Mg Impeller Forgings: Dr. Denis Carron, Dr. Nicolas Chobaut, Dr. Peter Saelzle and Dr. Jean-Marie Drezet, Université Bretagne Sud, Lorient, France, Laboratoire de Simulation des Matériaux, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, ABB Turbo Systems Ltd, Baden, Switzerland

3:50 p.m.
Study of Residual Stresses and Distortions After Steel Quenching With Vegetable Oils: Dr. Rosa L. Simencio Otero, Dr. Lauralice Canale, Dr. George E. Totten, Prof. Barbara Rivolta, Dr. Carlotta Civera and Dr. J.C. Lucio, University of Sao Paulo, São Carlos-SP, Brazil, Departamento de Engenharia de Materiais – SMM, Universidade de São Paulo, São Carlos-SP, Brazil, Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon, Meccanica, Politecnico di Milano, Milano, Italy, Sidervia Spa, Talamona, Italy

4:10 p.m.
Paralell PSO Method for Estimation Heat Transfer Coefficients: Dr. Imre Felde, University of Obuda, Budapest, Hungary

4:30 p.m.
Residual Stress and Bending Fatigue Strength in Carburized and Quench Hardened Pyrowear 53 Steel Gears: Dr. B. Lynn Ferguson, Mr. Andrew M Freborg and Dr. Zhichao (Charlie) Li, DANTE Solutions, Inc, Cleveland, Ohio, DANTE Solutions, Inc., Cleveland, Ohio

4:50 p.m.
The Development of a Process-Structure-Properties-Performance (PSPP) Map for Aluminum-Zinc-Magnesium-Copper Alloys Used In Aircraft Applications: Dr. Ashley Goulding, Dr. Richard W. Neu and Dr. Tom H. Sanders, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia, The George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia

6:30–8:30 p.m.
Networking Dinner and The Linde Group Poster Award
THURSDAY, APRIL 21, 2016

7:30–8:30 a.m.
Continental Breakfast
Meeting Room: Regency Ballroom Foyer

Advanced Thermal Processing III
8:30–10:10 a.m.
Meeting Room: Ballroom C

Session Chair: Richard Sisson

8:30 a.m.
Future Trends of Low Temperature Surface Hardening of Stainless Steel: Mr. Karl Andreas¹, Ms. Martina Wagner¹ and Mr. Patrick Jacquot², ¹Bodycote, Landsberg, Germany, ²Bodycote, Pusignan, France

8:50 a.m.
Computer Modeling of Induction Thermal Processing of Ferrous and Non-Ferrous Alloys: Collin Russell and Dr. Valery Rudnev, 32251 N.Avis Dr., Inductoheat, Madison Heights, Michigan

9:10 a.m.
Modeling of the Heating Sequences of Lightweight Bimaterial Billets For Hot Forging: Mr. Robert C. Goldstein¹, Dr. Xi Yang², Dr. Bulent Chavdar¹ and Dr. B. Lynn Ferguson¹, ¹Fluxtrol Incorporated, Auburn Hills, Michigan, ²General Motors, Pontiac, Michigan

9:30 a.m.
Influence of Synthesis on the Mechanical Properties of Sintered and Nanoporous Copper: Mr. Alexander P. Moore, Dr. Rakesh Kumar Behera, Mr. David Carroll, Dr. Chaitanya S. Deo and Dr. Antonia Antoniou, Georgia Institute of Technology, Atlanta, Georgia

9:50 a.m.
Effect of Laser Parameters on Hardness, Wear & Residual Stresses of H13 Steel: Mr. Shreyans Khot, Mr. Valmik Bhavar and Dr. RKP Singh, Research and development, KCTI, Bharat forge Ltd. Pune, India

Tribology and Wear of Engineered Surfaces
8:30–9:30 a.m.
Meeting Room: Ballroom B

Session Chair: Jeremy Epp

8:30 a.m.
Influence of Ultrasonic Nanocrystal Surface Modification Treatment Temperature on Microstructure and Tribological Behavior of Heat-treated and Non-heat Treated Bearing Steel: Dr. Auezhan Amanov, Mr. Jun-Hyong Kim and Prof. Young-Sik Pyun, Mechanical Engineering, Sun Moon University, Asan, South Korea

8:50 a.m.
Effect of Thermomechanical Treatment on Erosion Behaviors of 4343/3xxx Aluminum Clad Sheets during Brazing Heat Treatment: Dr. Kwangun Euh and Dr. Hyoung Wook Kim, Light Metals Department, Korea Institute of Materials Science, Changwon, South Korea

9:10 a.m.
The Erosion Behavior of Die-Steel Salt-Bath Nitrocarburized with Lithium-Iron Compound Oxide Layer in Molten Al-Si-Cu Alloy: Ms. Haruna ISHIZUKA, Mr. Yuya Hirai and Dr. Youichi Watanabe, Parker Netsushori Kogyo Co., Ltd., Kanagawa-ken, Japan

Residual Stress Symposium III
8:30–9:50 a.m.
Meeting Room: Ballroom DEF

Session Chair: Vasisht Venkatesh
Session Chair: Hans-Werner Zoch

8:30 a.m.

8:50 a.m.
Modeling and numerical Simulation of Quenching Processes of AISI 4140 Steel and Validation: Mr. Wei Shi¹, Fei-long NIU², Dr. Imre Felde³ and Guo JIN¹, ¹Department of Mechanical Engineering, Tsinghua University, Beijing, China, ²College of Materials Science and Chemical Engineering, Harbin Engineering University, Nangang, China, ³University of Öbuda, Budapest, Hungary

9:10 a.m.
Surface Structuring as a Method to Influence on Rewetting During Liquid Quenching: Mr. Nikolay Kozlov and Prof. Olaf Keßler, Chair of Materials Science, University of Rostock, Rostock, Germany

9:30 a.m.
Influence of Design on Distortion of Oil Quenched Gear Base Bodies: Dr. Thomas Luebben and Dr. Holger Surm, Heat Treatment, Stiftung Institut für Werkstofftechnik (IWT), Bremen, Germany

10:10–10:30 a.m.
Refreshment Break
Meeting Room: Regency Ballroom Foyer

Carburizing and Nitrocarburizing
10:30 a.m.–12:30 p.m.
Meeting Room: Ballroom B

Session Chair: Emilia Wolowiec-Korecka

10:30 a.m.
Simulation of the Effects of Temperature and Time on the Tempering Behavior of Carburized Steels: Mr. Yongjin Kim¹, Ms. Xiaoping Cai², Mr. Haixuan Yu¹ and Mr. Lei Zhang⁴, ¹Materials Science and Engineering, Center for Heat Treating Excellence (CHTE), Worcester, Massachussetts, ²Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts, ³Worcester Polytechnic Institute, Worcester, Massachusetts
10:50 a.m.  
**Novel Pack Cementations: Alternating Current Field Enhanced Pack Cementations:** Prof. Fei Xie¹, Mr. Shaoqiang Xu¹ and Mr. Jianwei Pan¹, ¹Materials Science and Engineering School, Changzhou University, Changzhou, China, ²Key Laboratory of Materials Surface Technology of Jiangsu Province, Changzhou University, Changzhou, China, ³Huaide College, Changzhou University, Changzhou, China

11:10 a.m.  
**Fluidized-Bed Carburizing in Chemically Active Powders of C22 Steel:** Mr. Aleksander Ciski¹, Prof. Tomasz Babuł¹, Konrad Lankiewicz¹, Jana Niznanska² and Pavel Suchmann², ¹Institute of Precision Mechanics, Warsaw, Poland, ²COMTES FHT, Pilsen, Czech Republic

11:30 a.m.  
**An Enhancement to the Low Pressure Carburizing Simulation:** Mr. Lei Zhang, Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts

11:50 a.m.  
**Pre-Nit Technology For Accelerated Vacuum Carburizing:** Mr. Michael Lister, Vacuum, Seco/Warwick, Meadville, Pennsylvania

12:10 p.m.  
**In-Line, High-Volume, Low-Distortion, Precision Case Hardening For Automotive, Transmission And Bearing Industry:** Dr. Maciej Korecki¹ and Dr. Emilia Wołowski-Korecka¹, ¹Seco/Warwick, Swiebodzin, Poland, ²Institute of Materials Science and Engineering, Lodz University of Technology, Lodz, Poland

**Advanced Thermal Processing IV**  
10:30 a.m.–12:10 p.m.  
Meeting Room: Ballroom C

**Session Chair:** Joseph Newkirk

10:30 a.m.  
**Grain Refinement Strategies in High Strength Cast Steel:** Prof. David C. Van Aken, Dr. Terrell O. Webb and Mr. Joshua Green, Materials Science & Eng., Missouri University of Science and Technology, Rolla, Missouri

10:50 a.m.  
**Mathematical Modeling and Computer Simulation of Non-monotonic Continuous Quenching:** Prof. Božo Smoljan, Dr. Dario IJkic and N/A Lovro Stic, Department of Materials Science and Engineering, Faculty of Engineering, University of Rijeka, Rijeka, Croatia

11:10 a.m.  
**Evaluation of Mechanical and Fatigue Properties of Weld Deposit and its Comparison with that of Die Steel:** Mr. Sachin Sitaram Patil, Mr. Shreyas Shashank Kirwai, Mr. Santosh Kumar, Mr. Atul Ramdas Patil, Mr. Jayant Bhuaurao Mane and Dr. Rajkumar P Singh, Kalyani Centre for Technology & Innovation, Bharat Forge Ltd., Pune, India

**Residual Stress Symposium IV**  
10:30–11:10 a.m.  
Meeting Room: Ballroom DEF

**Session Chair:** Scott MacKenzie  
**Session Chair:** David Furrer

10:30 a.m.  
**Improvement in Creep Rupture Ductility of Creep Strength Enhanced Ferritic Steel by New Heat Treatment Process with Intermediate Tempering:** Dr. Kazuhiro Kimura and Dr. Kota Sawada, National Institute for Materials Science, Tsukuba, Japan

11:50 p.m.  
**Improvement in Creep Rupture Ductility of Creep Strength Enhanced Ferritic Steel by New Heat Treatment Process with Intermediate Tempering:**

Dr. Kazuhiro Kimura and Dr. Kota Sawada, National Institute for Materials Science, Tsukuba, Japan

11:30 a.m.  
**Modeling the Mechanical Properties of Quenched And Tempered Martensitic Steels:** Ms. Xiaqing Cai¹, Mr. Yuan Lu¹ and Prof. Richard D Sisson², ¹Center for Heat Treating Excellence, Worcester Polytechnic Institute, Worcester, Massachusetts, ²Worcester Polytechnic Institute, Worcester, Massachusetts

11:10 a.m.  
**Thermodynamic and Kinetic Simulation And Experimental Results Homogenizing Advanced Alloys:** Dr. Paul D. Jablonski, Dr. Joseph J. Licavoli and Dr. Jeffrey A. Hawk, National Energy Technology Laboratory, Albany, Oregon

11:30 a.m.  
**Thermodynamic and Kinetic Simulation And Experimental Results Homogenizing Advanced Alloys:** Dr. Paul D. Jablonski, Dr. Joseph J. Licavoli and Dr. Jeffrey A. Hawk, National Energy Technology Laboratory, Albany, Oregon

11:50 p.m.  
**Improvement in Creep Rupture Ductility of Creep Strength Enhanced Ferritic Steel by New Heat Treatment Process with Intermediate Tempering:**

Dr. Kazuhiro Kimura and Dr. Kota Sawada, National Institute for Materials Science, Tsukuba, Japan
Uphill Quenching of Aluminum Alloys: A Process Review: Ms. Wellington Mattos, Dr. George E. Totten, Dr. D. Scott MacKenzie, Mr. Tom Croucher and Dr. Lauralice Canale, Departamento de Engenharia de Materiais – SMM, Universidade de São Paulo, São Carlos-SP, Brazil, G.E. Totten & Associates, LLC, Seattle, WA, Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon, Houghton International, Valley Forge, Pennsylvania, Croucher Associates, Norco, California

Characterization of BN/TiBN/TiN Multilayer Coatings prepared by Pulsed dc Plasma-Enhanced Chemical Vapor Deposition: Dr. Kazuki Kawata and Mr. Toru Kidachi, Research and Development, Oriental Engineering Co., Ltd., Kawagoe, Japan

Effect of Deep Cryogenic Treatment on Fracture Toughness of 300M Steel Using Circumferentially Notched Kic Test Specimens: Dr. Daniel Schuller, Dr. Vojteh Leskovsek and Dr. Lauralice Canale, Departamento de Engenharia de Materiais – SMM, Universidade de São Paulo, São Carlos-SP, Brazil, Heat Treatment and Surface Engineering Department, Institute of Metals and Technology, Ljubljana, Slovenia

Effect of Quenching and Tempering in Microalloyed Steels Containing Boron and Titanium: Dr. André Itman F., Mr. João Batista Ribeiro Martins, Mr. Wagner Monteiro Souza, Dr. Rosana Vilarim, Dr. Luiz C. Casteletti and Dr. George E. Totten, Metallurgical and Materials, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo (IFES), Vitoria - ES, Brazil, Metallurgical, ArcelorMittal, Serra-ES, Brazil, Metallurgical and Materials, Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, Vitoria - ES, Brazil, Materials Engineering, EESC-USP (Escola de engenharia de São Carlos - Universidade de São Paulo), São Carlos, Brazil, Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon

Application of Nano-Structured Copper-Polymer Catalyst for Activation of Gas Nitriding of Steels: Prof. L.G. Petrova, Prof. I.M. Papisov, Prof. I.S. Belashova, Dr. V.A. Aleksansrov, Dr. G.Yu Ostaeva, Dr. A.I. Papisova and Mr. A.E. Perekrestov, Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia

Development of a Laboratory Intensive Quenching (IQ) System: Mr. Luigi Leonardo Mazzucco Albano, Dr. George E. Totten, Fernando S. Misina and Dr. Lauralice de C. F. Canale, Department of Materials Engineering, University of SÃ£o Paulo, SÃ£o Carlos/SP, Brazil, SÃ£o Paulo State University-USP, Seattle, Brazil

Effects of Quench and Partitioning Heat Treatment in Mechanical Properties and the Microstructural Characterization of AISI 300M Steel: Prof. Ricardo Gratão Gregui, Dr. Lauralice Canale and Mr. Danilo Assad Ludewigs, Department of Materials, Federal Institute of Education, Science and Technology of São Paulo, Votuporanga, Brazil, Departamento de Engenharia de Materiais – SMM, Universidade de São Paulo, São Carlos-SP, Brazil, Industrial, Durferrit do Brasil Química, Diadema-SP, Brazil

Wear Behavior of Layers Produced by Boriding or PVD-Boriding Treatments on Aisi H13 Tool Steel: Mr. Ricardo Gomes Pereira, Mr. Galtiere Corrêa Rêgo, Dr. Luiz C. Casteletti, Dr. Amadeu N. Lombardi and Dr. George E. Totten, Materials Engineering, EESC-USP (Escola de engenharia de São Carlos - Universidade de São Paulo), São Carlos, Brazil, Mechanical Engineering, Federal Technological University of Parana, Londrina, Brazil, Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon
Effect of Boronizing on Wear Resistance of the Ti-6Al-4V ALLOY: Dr. Luiz C. Casteletti¹, Mr. Galtiere Corrêa Rêgo², Mr. Gustavo Satoru Takeya¹, Dr. Amadeu N. Lombardi² and Dr. George E. Totten³, ¹Materials Engineering, EESC-USP (Escola de engenharia de São Carlos - Universidade de São Paulo), São Carlos, Brazil, ²Mechanical Engineering, Federal Technological University of Parana, Londrina, Brazil, ³Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon

Characterization of a Plasma Nitrocarburized Fe-31.2Mn-7.5Al-1.3Si-0.9C STEEL ALLOY: Mr. Gustavo Satoru Takeya¹, Mr. Fabio Edson Mariani², Dr. Amadeu N. Lombardi³, Dr. Luiz C. Casteletti² and Dr. George E. Totten³, ¹Mechanical Engineering, Federal Technological University of Parana, Londrina, Brazil, ²Materials Engineering, EESC-USP (Escola de engenharia de São Carlos - Universidade de São Paulo), São Carlos, Brazil, ³Mechanical Engineering, Federal Technological University of Parana, Londrina, Brazil.

Oxidation Resistance of Ti-6Al-4V Hot-Dipped in Melted Al and Al-12Si Alloy: Mr. Galtiere Corrêa Rêgo¹, Mr. Gustavo Satoru Takeya², Dr. Amadeu N. Lombardi², Dr. Luiz C. Casteletti¹ and Dr. George E. Totten³, ¹Materials Engineering, EESC-USP (Escola de engenharia de São Carlos - Universidade de São Paulo), São Carlos, Brazil, ²Mechanical Engineering, Federal Technological University of Parana, Londrina, Brazil, ³Department of Mechanical and Materials Engineering, Portland State University, Portland, Oregon

Poster Awards Sponsored By: THE LINDE GROUP

Poster Awards will be presented during the conference dinner on Wednesday, April 20, 2016 in the Harborside Room.
Heat Treat 2017, the biennial co-located show from the ASM Heat Treating Society and the American Gear Manufacturers Association, is where heat treating professionals go to take stock of the industry and predict what’s coming in the future. Submit your 100-150 word abstract by December 30, 2016. Topics of interest include, but are not limited to:

- Additive Manufacturing/3D Processing
- Advances in Heat Treating
- Induction Heat Treating
- Quenching and Cooling
- Vacuum Processes and Technology

Call for abstracts deadline: December 30, 2016

For more information, visit the web at: www.asminternational.org/heatreat
SHOW DIRECTORY

EXHIBIT DATES AND TIMES
Location: Regency Ballroom A

Monday, April 18
Welcome Reception: 5:30–7:00 p.m.

Tuesday, April 19
Morning Refreshment Break: 10:40–11:00 a.m.
Lunch: 12:00–1:30 p.m.
Afternoon Refreshment Break: 3:10–3:30 p.m.

Wednesday, April 20
Morning Refreshment Break: 10:10–10:30 a.m.
Lunch: 12:30–1:30 p.m.

EXHIBITOR LIST

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<tr>
<td>Advanced Energy</td>
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<td>Wickert Hydraulic Presses USA</td>
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<td>WPX Faserkeramik GmbH</td>
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COMPANY PROFILES

Advanced Energy
Tabletop #3
Precision power from Advanced Energy® (AE®) enables design breakthroughs that drive growth for leading semiconductor, industrial, and solar customers. AE thermal management systems offer excellent temperature measurement and control, while AE power control modules provide exceptional quality for heating, melting, bending, forming, or drying in a variety of industrial applications.
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Airflow Sciences Corporation
Tabletop #5
Thirty years of CFD modeling experience combined with cutting edge boiling model research provides accurate assessments of quenching processes, augmenting or replacing thermocouple quench trials. Airflow Sciences Corporation’s analysis techniques have optimized heat treat processes such as furnace uniformity, high pressure gas quenching, air quenching, controlled cooling, and intensive quenching.
www.airflowsciences.com

AVL Advanced Simulation Technologies
Tabletop #8
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AVS Inc.
Tabletop #16
AVS has produced high temperature furnaces for the past 49 years. We are pleased to announce our new line of high pressure quench furnaces called “HI Bar”, available in standard sizes and pressures from 6-20 bar. Custom designs are available up to 200 bar to complement our 3000°C furnace lines.
www.avslnc.com

Buehler
Tabletop #15
Buehler, an ITW company, is a manufacturer of scientific instruments and supplies for Microstructural Analysis (sectioning, mounting, grinder/polishers, Wilson hardness testers, OmniMet imaging systems) and the finest quality consumables in the market for consistent sample prep results. Since 1936, Buehler has been innovating solutions and providing laboratory assistance to customers worldwide.
www.buehler.com

DANTE Solutions
Tabletop #13
DANTE Solutions, Inc. is an engineering solutions provider that specializes in improving heat treatment processes for steel components. Combining the expertise of metallurgists and mechanical engineers, we use our DANTE software tool to simulate carburizing and quench hardening processes to accurately predict dimensional change, metallurgical phases, hardness and residual stress.
www.dante-solutions.com

ECM USA
Tabletop #11
ECM Technologies started manufacturing heat-treatment furnaces in 1928. Since that time, ECM personnel have been committed to extending their knowledge in the field of temperature control, high pressures, vacuum and the behavior of materials. This concern has forged ECM USA’s recognized spirit of innovation. Call to see how ECM-USA can improve your process: 262-605-4810.
www.ECM-USA.com

Furnacare Inc.
Tabletop #7
Furnacare is a supplier of after sales services based in US and fully dedicated to provide technical assistance and spare parts for vacuum furnaces of any type and any brand. Among the provided services are leak detections, TUS/SAT tests, calibrations, hot zones repairs, upgrades of electrical cabinets, pumps repairs etc.
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Tabletop #19
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www.hcstarck.com

HORIBA Scientific
Tabletop #6
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www.horiba.com/scientific

Houghton International Inc.
Tabletop #1
Houghton is the world leader in heat treatment technology and application expertise across a wide range of industries. We supply pre-treatment cleaners, cold quenching oils, mar­­tempering oils, aqueous quenchants, and final cleaning and temper rust protection. Breakthrough techbiostable Aqua­­Quench® polymer quenchants provide superior results.
www.houghtonintl.com

Ionic Technologies
Tabletop #17
In 1998 Ionic Technologies, Inc. was established in Greenville, South Carolina, through a partnership with Aalberts Industries of Doorn, Netherlands. The company’s vision is to offer the metal working industry the highest level of Ion, Gas, and Solution Nitriding and Vacuum Heat Treatment services for all types of metals.
www.ionic-tech.com

Pulstec USA, Inc.
Tabletop #18
Pulstec provides non-destructive X-ray diffraction(XRD) based stress analyzer. This small, light-weight, low-cost, low-radiation-dose, fast-cycletime analyzer can measure Residual-Stress, FWHM and Retained-Austenite by detecting the full Debye ring’s profile from single incident X-ray angle. Ideal to use in lab or on-site.
www.pulstec.net
Sajjan Precision Castings
Tabletop #10
www.sajjancastingslimited.com

SECO/WARWICK CORP.
Tabletop #12
SECO/WARWICK is a leading global manufacturer of heat processing furnaces and equipment. Expertise includes furnaces and equipment in five categories: vacuum heat treatment; atmosphere heat treatment; controlled atmosphere brazing of aluminum heat exchangers; melting, holding, and thermal processing of aluminum; and vacuum metallurgy. SECO/WARWICK Group has seven companies located on four continents with customers in nearly 70 countries.
www.secowarwick.com

Thermo-Calc Software Inc.
Tabletop #2
www.thermocalc.com

Toyo Tanso USA
Tabletop #14
Toyo Tanso is the premier manufacturer of Iso-Molded Graphite & Carbon Fiber Composites in the world. Toyo Tanso is known industry wide for quality and consistency. Toyo Tanso is at the forefront of innovation in the thermal processing world offering customized and unique solutions for customers.
www.ttu.com

Wickert Hydraulic Presses USA
Tabletop #9
Wickert hydraulic press systems 110+ year history provides the basis for consulting, engineering, and integration of solutions to deliver a turnkey fixturing heat treat cell. Our goal is to deliver reliable throughput production capacity. Wickert press systems has provided engineered flexible systems for a multitude of different parts small to large batch running in one heat treat system.
www.wickert-usa.com

WPX Faserkeramik GmbH
Tabletop #4
WHIPOX® oxide fiber ceramics sustains extreme mechanical and thermal shocks (1000 °F / sec), shows minimal oxidation/corrosion, and no warping. This enables process improvements in the heat treatment of steel with respect to output quality, process uptime, and energy efficiency. WHIPOX® is e.g. used in combination with CFC charge carriers to avoid Carbon contamination of workpieces. In contrast to CFC, WHIPOX® charge carriers can be used in oxidizing atmospheres. WPX supplies renown automotive OEMs.
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