



AMERICAN CERAMIC SOCIETY

**St. Louis Section
and the
Refractory Ceramics Division**

Fifty-sixth Annual Symposium

on

Refractories – VIRTUAL MEETING

March 24-25, 2021

Theme:

“Properties and Performance of Refractory Ceramics – *A Tribute to Richard C. Bradt*”

PROGRAM

“Properties and Performance of Refractory Ceramics – A Tribute to Richard C. Bradt”

March 24th, 2021

- 9:00 A.M. Welcome
- 9:15 Let's Make a Castable with Almost No Water – and No Cement. Use of Particle Packing Principles to Minimize Water Addition to Castables
Bjørn Myhre - Elkem Silicon Materials
- 9:45 Thermal Shock of Refractories: A Review
Joseph Homeny - The Edward Orton Jr. Ceramic Foundation
- 10:15 4.1 Refractory Ceramics
Victor C. Pandolfelli - Federal University of São Carlos, Brazil
- 10:45 Break
- 11:00 Derivation of Thermal Stress Resistance Parameters through Dimensional Analysis
Jay J. Tu - HTMS, LLC
- 11:30 Structure Determines Properties: Failure Analysis of Ceramics and Refractories
David Ahearn – Esi
- 12:00PM Lunch Break
- 1:00 Presentation of the 2020 T.J. Planje St. Louis Refractories Award to **Thomas (Tom) Vert, P.Eng., M.B.A., B. Eng. (Ceramic) Retired Vice President Manufacturing – ArcelorMittal Dofasco Inc., Hamilton, Ontario, Canada**

Richard C. Bradt Education Session A

- 1:45 Applications of Fiber Optic Sensors in Ceramic Industry
Muhammad Roman and Jie Huang - Missouri University of Science and Technology
- 2:15 Machine Learning to Predict Refractory Corrosion During Nuclear Waste Vitrification
Natalie Smith-Gray, Irmak Sargin, Scott Beckman and John McCloy - Washington State University in Pullman, WA
- 2:45 Break
- 3:00 Interactions between Molten Tundish Slags and Periclase/Periclase-Olivine Tundish Linings
Tyler M. Richards, Jeffrey D. Smith, Ronald J. O'Malley and Todd P. Sander – Missouri University of Science and Technology
- 3:30 Building the Fundamental Basis for Advancement of Refractory Technology
Charles E. Semler - Refractories Consultant
- 4:00 Formation of Hexa-Aluminate Solid Solution Phases in Spinel Containing Castables – Mineralogical Investigations in the system CaO-Al₂O₃-MgO
Mark Snyder, Andreas Buhr, Sebastian Klaus, Marius Bauer, Matthias Göbbels and Jerry Dutton – Almatiss, Inc.
- 4:30 Closing Remarks

March 25th, 2021

- 8:00AM RCD Membership Meeting
- 9:00 Welcome
- 9:15 **2020 Alfred W. Allen Award Winner - J Am Ceram Soc. 2018;101:4171-4183**
On the Nonlinear Behavior of Young's Modulus of Carbon-Bonded Alumina at High Temperatures
Bruno Luchini, Joern Grabenhorst, Jens Fruhstorfer, Victor C. Pandolfelli and Christos G. Aneziris;
- 10:15 Sample Preparation, Thermal Expansion, and Hasselman's Thermal Shock Parameters of Self-Flow Refractory Castables
William L. Headrick, Jr. – RHI Magnesita
- 10:45 Break
- 11:00 Corrosion Interaction between Copper Melt, Slags and Sic-Based Refractories
Sarra Boubtane - University of Applied Sciences, WesterWaldCampus, Höhr-Grenzhausen; Almuth Sax - University of Koblenz-Landau, Chair of Technical Chemistry and Corrosion Science, Koblenz; Dieter Heumannskämper - Morgan Molten Metal Systems GmbH, Berkatal-Frankenhain; Peter Quirnbach - Deutsches Institut fuer Feuerfest und Keramik, Germany
- 11:30 "Stronger Is Not Always Better" and Other Lessons from Dick Bradt as Applied to Monolithic Refractories Development and Characterization
Len Krietz
- 12:00PM Lunch Break
- 1:00 Presentation of the 2021 T.J. Planje St. Louis Refractories Award to **Ruth Engel – Refractory Consulting Services**

Richard C. Bradt Education Session B

- 1:45 Investigation of the Solidification Behavior of an Industrial Mold Flux Film Using the Single Hot Thermocouple Technique
Cassandra C. Hurley, Ronald J. O'Malley, Laura N. Bartlett and Jeffrey D. Smith - Missouri University of Science and Technology
- 2:15 Electrochemical Suppression for Steel-Flux Reduction-Oxidation Reactions between Silica and Aluminum
Tiffany N. Wysong, Ronald J. O'Malley, Michael M. Moats and Jeffrey D. Smith - Missouri University of Science and Technology
- 2:45 Break
- 3:00 Imerys' Calcined Aluminosilicates- A Data-Based Comparison of Our Expanded Higher Alumina Range
Scot Graddick, Cyrille Deteuf and Phil Edwards - Imerys RAC
- 3:30 High Grade Guyanese Bauxite Source in a Class of Its Own
John Karson - First Bauxite, LLC
- 4:00 Closing Remarks