



**AMERICAN CERAMIC SOCIETY**

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

Fifty-sixth Annual Symposium

on

Refractories

**March 25-26, 2020**

**Hilton St. Louis Airport Hotel**

**Theme:**

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

## DRAFT - PROGRAM

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

March 24<sup>th</sup>, 2020

5:30 P.M. Kickoff Event – Topgolf St. Louis - <https://topgolf.com/us/st-louis/>

March 25<sup>th</sup>, 2020

7:15 A.M. Registration and Coffee

8:00 Morning Technical Sessions  
Welcome and Introductions

**St. Louis Section Chairman**

*Chris Perry*

Christy Refractories

**Refractory Ceramics Division Chair**

*Ashley Hampton*

RHI Magnesita

**Co-Program Coordinators**

*Jeff Smith*

Missouri University of Science and Technology

*Kelley Wilkerson*

Missouri University of Science and Technology

8:15 Increased Usage of Scientific Methodology for the Advancement of Refractory Technology  
*Charles E. Semler - Refractories Consultant*

8:45 Thermal Shock of Refractories: A Comprehensive Review  
*Joseph Homeny - The Edward Orton Jr. Ceramic Foundation*

9:15 Reflections on the Thermal Shock Fundamentals and Their Parameters  
*Vânia R. Salvini and Victor C. Pandolfelli - Federal University of São Carlos, Brazil*  
*Richard C. Bradt In Memoriam - University of Alabama*

9:45 Coffee Break

10:15 Derivation of Thermal Stress Parameters through Dimensional Analysis  
*Jay J. Tu - HTMS, LLC*

10:45 Structure Determines Properties: Failure Analysis of Ceramics and Refractories  
*David Ahearn - ESI*

11:15 Sample Preparation, Thermal Expansion, and Hasselman's Thermal Shock Parameters of Self-Flow Refractory Castables  
*William L. Headrick, Jr. - Missouri Refractories Company, Inc. (MORCO)*

11:45-12:45 Luncheon Banquet

## Afternoon Session

- 12:45-1:30 Presentation of the 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**
- 1:30 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*
- 2:00 Formation of Hexa-Aluminate Solid Solution Phases in Spinel Containing Castables – Mineralogical Investigations in the system CaO-Al<sub>2</sub>O<sub>3</sub>-MgO  
*Mark Snyder, Andreas Buhr, Sebastian Klaus, Marius Bauer, Matthias Göbbels and Jerry Dutton – Almatiss, Inc.*
- 2:30 Coffee Break
- 3:00 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*

## Richard C. Bradt Education Session A

- 3:30 Applications of Fiber Optic Sensors in Ceramic Industry  
*Muhammad Roman and Jie Huang - Missouri University of Science and Technology*
- 4:00 Machine Learning to Predict Refractory Corrosion during Nuclear Waste Vitrification  
*Natalie Smith-Gray - Washington State University in Pullman, WA*
- 4:30 Questions & Discussion  
Co-Program Coordinator  
Introduction of Students in Attendance
- 4:45 RCD Annual Members Meeting
- 5:00 Closing Remarks  
*Chris Perry*  
Christy Refractories  
*Ashley Hampton*  
RHI Magnesita
- 5:00-7:00 Exposition and Cocktail Hour
- |                               |                               |
|-------------------------------|-------------------------------|
| Almatiss, Inc.                | Great Lakes Minerals, LLC     |
| Alteo NA, LLC                 | Hindalco/GBL                  |
| AluChem, Inc.                 | IMERYS                        |
| American Ceramic Society      | Kyanite Mining Corp.          |
| Anton Paar                    | Monofrax                      |
| BassTech International        | Norchem, Inc. - Ferroglobe    |
| Bettersize Particle Size      | Orton Ceramic Foundation      |
| Christy Minerals              | R-E-D Industrial Products     |
| DIFK GmbH, Germany            | Refractory Minerals Co., Inc. |
| Elkem Silicon Materials, Inc. | TAM Ceramics                  |
| First Bauxite                 | Ultra Test                    |
| GEO 40                        | Washington Mills              |
| Gorka Cement                  |                               |
- 7:00 Dinner Buffet

March 26<sup>th</sup>, 2020

6:30 A.M. Refractory Ceramics Division (RCD) Breakfast Meeting

8:15 Morning Technical Sessions  
Welcome and Introductions

**St. Louis Section Chairman**

*Chris Perry*

Christy Refractories

**Refractory Ceramics Division Chair**

*Ashley Hampton*

RHI Magnesita

**Co-Program Coordinators**

*Jeff Smith*

Missouri University of Science and Technology

*Kelley Wilkerson*

Missouri University of Science and Technology

8:30 "Stronger Is Not Always Better" and Other Lessons from Dick Bradt as Applied to Monolithic Refractories Development and Characterization  
*Len Krietz*

**Richard C. Bradt Education Session B**

9:00 Investigation of the Solidification Behavior of an Industrial Mold Flux Film Using the Single Hot Thermocouple Technique  
*Cassandra Hurley, Ronald J. O'Malley and Laura Bartlett - Missouri University of Science and Technology*

9:30 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*

10:00 Coffee Break

10:30 Interactions between Molten Materials and Periclase/Periclase-Olivine Tundish Linings"  
*Tyler Richards, Jeffrey D. Smith, Ronald J. O'Malley and Todd Sander - Missouri University of Science and Technology*

11:00 Imerys' Aluminosilicate Calcines- A Data-Based Comparison of Our Expanded Higher Alumina Range  
*Scot Graddick, Cyrille Deteuf and Phil Edwards - Imerys RAC*

11:30 Guyanese Bauxite Source Fills the Gap in the Alumina Raw Materials Line  
*John Karson - First Bauxite, LLC*

12:00 Questions & Discussion  
Co-Program Coordinator

*Chris Perry*

Christy Refractories

*Ashley Hampton*

RHI Magnesita

12:30 St. Louis Section Officer Business Meeting & Lunch

## REGISTRATION FORM

**Please select:**

- Pre-Registration Fee (Deadline March 18)     \$225.00
- On-Site Registration Fee     \$275.00
- Emeritus/Senior Fee     \$125.00
- Student Fee     \$50.00
- Exhibitor for Exposition (Table Top)     \$300.00  
**(Exhibitor cost does not include registration fee)**
- Need Electricity
- Check meal choice...**
- Lunch -  Chicken  Fish  Pasta/Vegetarian
- Dinner Buffet
- Guest for Dinner     \$40.00

*(Fill in below)*

NAME:
NAME ON BADGE:
COMPANY:
ADDRESS:
CITY/STATE/ZIP:
EMAIL:
TEL/FAX:

**METHOD OF PAYMENT**

CHARGE MY CARD: \$			
MC: <input type="checkbox"/>	VISA: <input type="checkbox"/>	AMEX: <input type="checkbox"/>	DISCOVER: <input type="checkbox"/>
CC#:			
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SIGNATURE:			
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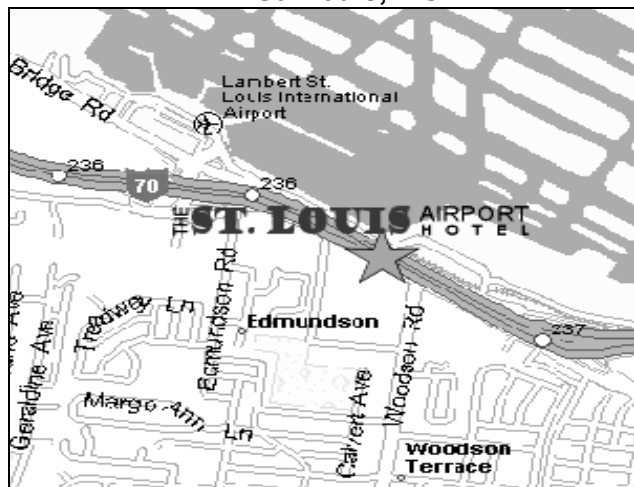
Company or Personal Check in U.S. Dollars  
**(Make checks payable to: St. Louis Section)**

Send To: Patty Smith  
 Missouri S&T  
 105 Straumanis-James Hall  
 401 W. 16<sup>th</sup> St.  
 Rolla, MO 65409  
 Tel (573) 341-6265  
 Fax (573) 341-2071  
 Email: psmith@mst.edu

**NOTE: Dress Attire – Semi Casual (Tie Optional)**

**LOCATION**

**Hilton St. Louis Airport Hotel**  
 10330 Natural Bridge Road  
 St. Louis, MO



A block of rooms has been set aside at the Hilton St. Louis Airport Hotel in St. Louis, MO for this meeting. Please refer to **Group Code SAC** at the Hilton when reserving a room for which the rate is \$115.00 single/double per night or you can reserve online. **Reservations must be made before March 6, 2020**

**HOTEL ACCOMMODATIONS**

Hilton Hotel (**Mar. 6, 2020**)     (314) 426-5500

The web page address is :

[https://secure3.hilton.com/en\\_US/hi/reservation/book.htm?inputModule=HOTEL&ctyhocn=STLHIHF&spec\\_plan=SAC&arrival=20200323&departure=20200327&cid=OM,WW,HI&LTONLINK,EN,DirectLink&fromId=HILTONLINKDIRECT](https://secure3.hilton.com/en_US/hi/reservation/book.htm?inputModule=HOTEL&ctyhocn=STLHIHF&spec_plan=SAC&arrival=20200323&departure=20200327&cid=OM,WW,HI&LTONLINK,EN,DirectLink&fromId=HILTONLINKDIRECT)

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