

# **40th International Conference on Thermal Treatment Technologies and Hazardous Waste Combustors (IT3/HWC)**

Charlotte, North Carolina, USA  
13-14 September 2023

ISBN: 979-8-3313-0821-6

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# FINAL PROGRAM

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## Technical Program – Wednesday, September 13

7:30 am – 5:00 pm

Conference Registration  
Symphony 5 Foyer

7:30 am – 8:30 am

Continental Breakfast  
Symphony 6 & 7

7:30 am – 8:30 am

Presenters' Meeting  
Symphony 5

ALL TECHNICAL SESSIONS WILL BE HELD IN SYMPHONY 5

### Opening Keynote

8:30 am – 9:15 am

#### Welcome

Jordan Haywood, A&WMA President; Margarita Murach, Dürr Systems, Inc., Conference Chair

#### Beneficial Use of Coal Ash

Rick Haverland, Technical Director, ZAG International 1

9:15 am – 9:30 am

Networking Break and Display Viewing  
Symphony 6 & 7



Rick Haverland

Sponsored By:



## Technical Program – Wednesday, September 13, con't.

### Session 1: Incineration: What's New?

Chair: Mel Keener, CRWI

**9:30 am – 10:00 am**

IT3-15

**Revisions to the Hazardous Waste Combustor MACT Regulations** 27

*Mel Keener, CRWI, Ashburn, VA*

**10:00 am – 10:30 am**

IT3-33

**Pilot-scale Incineration of Fluoropolymers: Evaluation of the Potential Formation of PFAS in Flue Gases** 36

*P. H. Taylor, P Taylor & Associates, Lebanon, OH; Deepak Kapoor, GFL; Pyrianga Gunasekar, GFL; H-J Gehrman, KIT; K. Aleksandrov, KIT; S. Herremans, SGS Belgium NV*

**10:30 am – 11:00 am**

IT3-23

**Enhanced Thermal Treatment of PFAS-Laden Granular Activated Carbon with Additives** 48

*Liliya Chernysheva, Charbel Abou-Khalil, Kyle Doudrick, University of Notre Dame, Notre Dame, IN*

**11:00 am – 11:30 am**

IT3-06

**Commercial Organic Chemical Waste Destruction Using Supercritical Water Oxidation** N/A

*John Follin, General Atomics, San Diego, CA*

**11:30 am – 12:00 pm**

**Exhibitor Presentations**

*Hosted by Cornelia Cretiu, SOLVAir*

**12:00 pm – 1:00 pm**

**Lunch**

Cardinal Ballroom

### Panel: Advancements in PFAS Control Technologies

**1:00 pm – 3:15 pm**

Chair: William Roberson, U.S. Environmental Protection Agency

IT3-35

**Analytical Methods for Quantifying Per- and Polyfluorinated Alkyl Substances in Source Samples: An Overview of Other Test Methods 45 and 50** 57

*M. Ariel Geer Wallace, Marci Smeltz, U.S. Environmental Protection Agency, Office of Research and Development, Center for Environmental Measurements and Modeling, Air Methods and Characterization Division, Research Triangle Park, NC*

IT3-27

**Comparison of the Thermal Destruction of C1 and C2 Fluorine/Chlorine Homologues in a Pilot-scale Research Furnace: Modeling and Experiments** 76

*Martin Denison, David Swensen, Marc Cremer, Brydger Van Otten, Reaction Engineering International, Salt Lake City, UT; Jost Wendt, University of Utah, Salt Lake City, UT; Jonathan Krug, Garrett Dildine (Oak Ridge Associated Universities), William Roberson, Erin Shields, James Mattila (Oak Ridge Institute for Science and Education), Paul Lemieux, William Linak, U.S. Environmental Protection Agency, Office of Research and Development, RTP, NC; Preston Burnette, Stella McDonald, Calvin Whitfield, Jacobs Technology Inc., Cary, NC*

IT3-32

**Use of Fluorinated Refrigerants as Indicators of Thermal Treatment Effectiveness for Per- and Polyfluoroalkyl Substances (PFAS)** 86

*Jonathan Krug, William Roberson, Erin Shields, James Mattila (Oak Ridge Institute for Science and Education), Paul Lemieux, William Linak, U.S. Environmental Protection Agency, Office of Research and Development, RTP, NC; Preston Burnette, Stella McDonald, Calvin Whitfield, Jacobs Technology Inc., Cary, NC; William Preston, CSS Inc., Durham, NC*

IT3-21

**Quantification of GAC-Adsorbed Volatile Organofluorines (VOFs) Using Particle-Induced Gamma Ray Emission Spectroscopy (PIGE)** 100

*Liliya Chernysheva, University of Notre Dame, Notre Dame, IN*

IT3-22

**Tackling the PFAS Challenge Head On with Supercritical Water Oxidation - Never Say Forever** 110

*Kobe Nagar, Sudhakar Viswanathan, 374Water, Inc.; Marc Deshusses, Duke University & 374Water, Inc., Durham, NC*

**3:15 pm – 3:30 pm**

**Networking Break and Display Viewing**

Symphony 6 & 7

# FINAL PROGRAM

## Technical Program – Wednesday, September 13, con't.

### Session 2: Carbon Capture, Biomass, Bioenergy

Chair: William Norris, Ramboll

**3:30 pm – 4:00 pm**

IT3-04

**Feasibility Study of Carbon Capture and Storage for World's First Climate Positive Cement Producer**

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*William Norris, Ramboll, Hunt Valley, MD; Burcin Temel McKenna, Christian Riber, Jimmy Andersen, Ramboll, Copenhagen, Denmark*

**4:00 pm – 4:30 pm**

IT3-17

**Small Waste-to-Energy Power Generation and the Benefits to Industry and Communities**

133

*Dale Haase, SCS Engineers, Charleston, SC*

**4:30 pm – 5:00 pm**

IT3-24

**Pilot-Scale Thermochemical Conversion of High Water Content Waste Biomass to Hydrochar: Mass and Energy Balance, Benefits, Challenges, and Scalability**

141

*Mukesh Kapila, Richard Bingham, Kieran Kapila, Enoverra, Houston, TX*

**5:00 pm – 6:00 pm**  
**Networking Reception**  
Symphony 6 & 7



## Technical Program – Thursday, September 14

**7:00 am – 3:00 pm**

Conference Registration  
Symphony 5 Foyer

**7:00 am – 8:00 am**

Continental Breakfast  
Symphony 6 & 7

**7:00 am – 8:00 am**

Presenters' Meeting  
Symphony 5

### Session 3: Advancements in Refractory Design

Chair: Ryan McDonald, HarbisonWalker International

**8:00 am – 8:30 am**

IT3-02

**Corrosion (Resistance) in Hazardous Waste Incinerators**

150

*Johannes Boersma, Goudkade 2, The Netherlands*

**8:30 am – 9:00 am**

IT3-12

**New Considerations for Refractory Lining Design**

*Ryan McDonald, HarbisonWalker International, Pittsburgh, PA*

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**9:00 am – 9:30 am**

IT3-30

**Lessons from Failure Analyses in Challenging Refractory Application Environments**

174

*Tim Marth, Dana Goski, Dominic Loiacono, Allied Mineral Products, Columbus, OH*

**9:30 am – 9:45 am**

**Networking Break and Display Viewing**

Symphony 6 & 7

## Technical Program – Thursday, September 14, con't.

### Session 4: Source Emission Testing Method Updates

Chair: David Ostaszewski, Alliance Technical Group

**9:45 am – 10:15 am**

IT3-08

**PFAS Testing Results at the Clean Harbors, Aragonite Hazardous Waste Incinerator** 186

*Bill Troxler, Focus Environmental; Mike Crisenbery, Clean Harbors; Frank Barranco, John Kumm, Steve Yankay, EA EST*

**10:15 am – 10:45 am**

IT3-13

**Metal HAP Emissions Continuous Monitoring with Sorbent Traps** 199

*Alexandra Sipershteyn, Ohio Lumex Company, Cleveland, OH*

**10:45 am – 11:15 am**

IT3-28

**OTM-45 Sampling Lessons Learned** 209

*Jesse Rocha, Alliance Technical Group, Carrollton, TX*

**11:15 am – 11:45 am**

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**A Survey of EPA Sampling and Analysis Strategies for the Characterization of PFAS Off-gas from Thermal Treatment Systems** 218

*Courtney Adkins, William C. Anderson, Eurofins US*

**11:45 am – 12:45 pm**

**Lunch and Awards Presentation**

Cardinal Ballroom



### Session 5: Advancements in Air & Water Control Technologies

Chair: Bill Linak, U.S. Environmental Protection Agency

**12:45 pm – 1:15 pm**

IT3-36

**Advanced Gas Cleaning Wet Scrubber Technology for Spodumene Lithium Mineral Processing** 227

*Andrew Bartocci, Envitech, Inc., San Diego, CA*

**1:15 pm – 1:45 pm**

IT3-03

**Current State of Dry Sorbent Injection (DSI) Solution** 234

*Gerald Hunt, Ian Saratovsky, Lhoist North America, Fort Worth, TX*

**1:45 pm – 2:15 pm**

IT3-29

**High Efficiency Catalytic Filter Bags for NOx and Particulate Emission Control in Integrated Steel Plants** 244

*Tarun Poddar, W. L. Gore & Associates, Elkton, MD*

**2:15 pm – 2:45 pm**

IT3-31

**Phosphorus Recovery from Wastewater Treatment Sludges** 259

*Cornelia Cretiu, Kai Sartorius, SOLVAir, Houston TX*

**2:45 pm – 3:15 pm**

IT3-11

**Clean-Air Technologies & Services - Biogas Industry** 268

*Anu Vij, Ship & Shore Environmental, Inc., Signal Hill, CA*

**3:15 pm – 3:45 pm**

IT3-10

**Evaluation of Thermal Pre-treatment on Reactivity Reduction of Aluminium Alloy Waste Powders** N/A

*Roya Biabani, Piero Ferrari, Mentore Vaccari, University of Brescia, Department of Civil Engineering, Architecture, Land and Environment, Brescia, Italy*

**3:45 pm**

**Conference Adjourns**

**3:45 pm – 4:45 pm**

**Program Advisory Committee (PAC) Meeting**