



INFUB - 15th European Conference on Industrial Furnaces and Boilers

Final Programme

Tuesday, 07/Apr/2026

3:00pm -	REGISTRATION
6:00pm	Location: Costa Verde Room Foyer
6:00pm -	OPENING SESSION WELCOME ADDRESS
6:30pm	Location: Costa Verde Room
6:40pm -	KEYNOTE LECTURE I
7:30pm	Location: Costa Verde Room Harald Raupenstrauch - Technical University of Leoben, Austria "New materials demand new safety requirements"
8:00pm	WELCOME DINNER
	Location: Restaurant O Jardim


Wednesday, 08/Apr/2026

8:30am

KEYNOTE LECTURE IILocation: **Costa Verde Room**

9:20am

Jesper Ejenstam - Kanthal, Sweden

"Large-scale electrification and industrial heating; opportunities and challenges"

9:25am

1. AMM 1: Ammonia 1Location: **Costa Verde Room**

10:45am

Chair: **Christine Rousselle**

Development of global reaction mechanism of ammonia for CFD simulations on cofiring with pulverized coal

Woosuk Kang, Changkook Ryu
School of Mechanical Engineering,
Sungkyunkwan University, Suwon
16419, Republic of Korea

2. MET 1: Metals 1Location: **Nova Iorque Room**Chair: **Kentaro Umeki**

Investigation of the oxidation behavior of metal fuel particles in oxy-fuel atmospheres using emission spectroscopy

Daria Golab, David Tarlinski, Martin Schiemann
Institute of Energy Plant Technology, Ruhr-
University Bochum, Bochum, Germany

3. ELE 1: Electrification 1Location: **Porto Room**Chair: **Markus Mann**

Heat transfer conditions in a plasma-heated rotary kiln and the effect of coating layer formation

Alice Fakt¹, Ibrahim Qasim¹, Saumitra Mishra¹, Adrian Gunnarsson¹, Fredrik Normann¹, Klas Andersson¹, Bodil Wilhelmsson²

1: Chalmers University of Technology, Sweden; 2: Heidelberg Materials Cement Sverige AB

Investigation of Laminar Burning Velocity in Ammonia-Based Fuel Mixtures with Biogas and Hydrogen Addition

Michael Wagner, Arkajit Ghosh, Hartmut Krause, Sven Eckart
Institute of Thermal Engineering, TU
Bergakademie Freiberg, Germany

Oxidation of Iron Particles in a Low-Temperature Fluidized Bed: Towards Sustainable Metal Fuel Combustion

Julie ROUTURIER, Cornelius SCHONNENBECK, Jean-François BRIHLAC, Valérie TSCHAMBER
Université de Haute-Alsace, LGRE UR 2334,
F-68100 Mulhouse, France

Development and Application of Plasma-Based Heating Technologies in High-Temperature Industrial Furnaces

Sven Eckart^{1,2}, Ralph Behrend¹, Ratzmann Tobias¹, Liebsch Dominik¹, Hartmut Krause¹
1: TU Bergakademie Freiberg, Germany; 2: Centre of Excellence for Safety Research (CESAR), VSB – Technical University of Ostrava

Acceleration of ammonia combustion by hydrogen radical induced decomposition: Insights into the performance and application of hydrogen-ammonia coupled burners

Jie Cui^{1,2}, Xiu Yang¹, Rui Ma^{1,3}, Youning Xu¹, Honglei Zhao¹, Manfred Wirsum², Shuo Yang¹, Honggang Pan¹, Jianhua Qi⁴
1: Shenyang Institute of Engineering, China; 2: RWTH Aachen University, Germany; 3: Shenyang Hydrogen Clean Energy Technology Co., Ltd, China; 4: Liaoyang Guocheng Thermal Power Co., Ltd, China

Burning Iron powder in a coal combustion chamber

Rizwan Mehmood¹, Sven Mehlhose¹, Quentin Fradet¹, Steffen Grusla², Tobias Zschunke², Uwe Riedel¹
1: German Aerospace Center (DLR), Institute of Low-Carbon Industrial Processes, Germany; 2: Zittau/Görlitz University of Applied Sciences, Institute of Process Engineering, Process Automation and Metrology, Germany

Large-Eddy Simulation of Swirl-Stabilized Iron Dust Flames: Effects of Oxygen Concentration

Antje Vahl, Pascal Steffens, Hendrik Nicolai, Christian Hasse
Technical University of Darmstadt, Germany

Electrification and carbon utilisation of dry reforming of methane (DRM) via thermal plasma

Iacopo Aloisi¹, Ivan Gogolev², Teresa Berdugo Vilches¹, Martin Seemann¹
1: Chalmers University of Technology, Sweden; 2: University of Waterloo

Experimental Investigation of Ammonia-Syngas Plasma-Assisted Combustion

Adolfas Jančiauskas, Rolandas Paulauskas, Ernest Bykov, Kęstutis Zakarauskas
Lithuanian Energy Institute, Lithuania

Assessment of plasma torches as alternative energy supply in furnaces and computational comparison with combustion processes

Rene Prieler¹, Stefan Schwarz¹, Georg Daurer¹, Frank Laurisch², Roland Rückert², Michael Schnick², Christoph Hochenauer¹
1: Institute of Thermal Engineering, Graz University of Technology, Inffeldgasse 25/B, A-8010 Graz, Austria; 2: Kjellberg Finsterwalde Plasma und Maschinen GmbH, Oscar-Kjellberg-Straße 20, DE-03238 Finsterwalde

10:45am

COFFEE BREAK

11:15am

Location: **Costa Verde Room Foyer**



11:15am - 12:35pm	4. BIO 1: Biomass 1 Location: Costa Verde Room Chair: Francesca Cerciello	5. CCS 1 (oxy): CCS 1 (oxy) Location: Nova Iorque Room Chair: Alessandro Parente	6. PLA 1: Plastics 1 Location: Porto Room Chair: Jean-Bernard MICHEL
	<p>Morphological analysis of walnut shell and beech wood particles during flash pyrolysis: Investigation of particle shape and porosity Erik Freisewinkel¹, Tim Eisenbach², David Tralinski¹, Martin Schiemann¹, Roland Span², Viktor Scherer¹ 1: Institute of Energy Plant Technology, Ruhr-University Bochum, Germany; 2: Thermodynamics, Ruhr University Bochum, Germany</p>	<p>Experimental Investigation of natural gas-oxyfuel flames with hydrogen admixture and the Challenges of exhaust gas measurements Anna Hasche, Sven Eckart, Hartmut Krause Institute for gas and thermal engineering systems, TU Bergakademie Freiberg, Germany</p>	<p>Multidimensional modelling of polyvinyl chloride thermal decomposition using reduced-order chemistry and computational fluid dynamics Zouhir Bouchaar¹, Jo Van Caneghem¹, Maarten Vanierschot², Johan De Greef¹ 1: ChEMaRTS – Department of Materials Engineering – Group T campus – KU Leuven – Leuven (Belgium); 2: AFAA – Department of Mechanical Engineering – Group T campus – KU Leuven – Leuven (Belgium)</p>
	<p>Experimental and modeling study from fast biomass pyrolysis to support industrial bio-CLC development Alice Wittmann, Cornelius Schönnenbeck, Jean-François Brilhac, Alain Brillard, Guillaume Gerandi, Valérie Tschamber Université de Haute-Alsace, LGRE UR 2334, F-68100 Mulhouse, France</p>	<p>Oxyfuel Combustion of Biogenic Pyrolysis Gas for Process Heat Supply and CO₂ Capture Felix Lehner, Christian Groves, Niklas Gebhard, Martin Meiller Fraunhofer-Institut UMSICHT, Germany</p>	<p>Thermochemical Conversion of Wood-Plastic Composites Christian Fischer¹, Michael Dölz², Tobias Plesing³ 1: Institut für Wasserstoff- und Energietechnik - Hochschule Hof, Germany; 2: Institut für Wasserstoff- und Energietechnik - Hochschule Hof, Germany; 3: Institut für Wasserstoff- und Energietechnik - Hochschule Hof, Germany</p>
	<p>Negative Emission Technology: Developing a new multifuel furnace for flexibly producing biochar and heat Martin Pichler¹, Maximilian Steiner¹, Lukas von Berg¹, Christoph Hochenauer¹, Robert Scharler¹, Markus Buchmayr² 1: Institute of Thermal Engineering, Graz University of Technology, Inffeldgasse 25b, A-8010 Graz, Austria; 2: Hargassner GesmbH, Anton Hargassner Strasse 1, A-4952 Weng, Austria</p>	<p>Study of coaxial oxy-fuel hydrogen-methane flames for melting furnace applications Mario Ditaranto, Mette Bugge, Ewa Karchniwy, Inge Saanum SINTEF Energy Research, Norway</p>	<p>Thermal Decomposition of Alternative Fuels Using Hot Cement Meal in a Loop seal Pulsating Fluidized Bed Revanth M¹, Kamal Negi¹, Hao Wu², Mohamadali Mirzaei², Morten Nedergaard Pedersen³, Satyanarayana B⁴, Varunkumar S¹ 1: Department of Mechanical Engineering, Indian Institute of Technology Madras, Chennai, India; 2: Department of Chemical and Biochemical Engineering, Technical University of Denmark, Søtofts Plads, Lyngby Campus, 2800 Kgs. Lyngby, Denmark; 3: FLSmidth Cement A/S, Vigerslev Allé 77, Valby 2500, Denmark; 4: FLSmidth Cement India LLP, Chennai, India</p>
	<p>Torrefaction of Spent Coffee Grounds: Effects of Devolatilization Conditions on Fuel Quality and Performance Bassazin Ayalew Mekonnen¹, Solomon Workneh Fanta², Johan De Greef³, Jo Van Caneghem³, Maarten Vanierschot^{1,4} 1: Department of Mechanical Engineering, Group T Leuven campus, KU Leuven, BE-3000 Leuven, Belgium; 2: Faculty of Chemical and Food Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Bahir Dar, Ethiopia; 3: Department of Materials Engineering, Group T Leuven campus, KU Leuven, BE-3000 Leuven, Belgium; 4: Materials Science, Innovation and Modelling (MaSIM) Research Focus Area, North-West University, Mmabatho 2745, South Africa</p>	<p>Ch0C: a low-carbon dioxide and low-NOx oxy-fuel boiler pilot Livia TARDELLI¹, Soizic ESNAULT², Florian LAGRANGE², Stephan RESENT³, Laurent MARIAC⁴, Etienne HADDAD⁵, Giampaolo MAIO⁶, Ludovic FERRAND⁶, Joan OLIVIER⁷, Louis RICCI⁸ 1: NaTran; 2: Naldeo Technologies & Industries; 3: GRDF; 4: TotalEnergies OneTech; 5: Verdemobil Biogaz; 6: ENGIE Lab CRIGEN; 7: Babcock Wanson; 8: Fives</p>	<p>Progress and Challenges in Modeling Plastic Pyrolysis Feichi Zhang¹, Muhao Li¹, Salar Tavakkol¹, Xiaoyue Ma¹, Thorsten Zirwes², Rui Zhang³, Dieter Stapf¹ 1: Karlsruhe Institute of Technology, Germany; 2: University of Stuttgart, Germany; 3: Nanjing University of Science and Technology, China</p>
12:35pm - 1:50pm	LUNCH Location: Restaurant O Jardim		


1:50pm - 2:40pm
PS1: POSTER SESSIONS - SHORT PRESENTATIONS

 Location: **Costa Verde Room**
 Chair: **Sébastien Caillat**
P1 Impact of Fuel Velocity on a Self-Recuperative Burner in a PP-type Radiant Tube Operating on Natural Gas and Hydrogen: A Numerical Study
Johannes Losacker¹, Elsa Busson¹, Johanna Effertz¹, Nico Schmitz¹, Joachim Wüning², Christian Wuppermann¹

1: RWTH Aachen University, Department for Industrial Furnaces and Heat Engineering, Germany; 2: WS Wärmeprozessestechnik GmbH, Germany

P2 Adapting to the fuel: a new approach to low-NOx industrial combustion
Marcel Biehl¹, Nicolas Rupietta², Anne Giese¹, Christoph Wieland³

1: Gas- und Wärme-Institut Essen e.V., Germany; 2: Friedrich Ley GmbH, Germany; 3: Chair for Energy Process Engineering and Energy Systems, University of Duisburg-Essen, Germany

P3 Effects of oxygen-enriched combustion on furnace and blooms in an industrial reheating furnace: Coupled CFD simulations with comprehensive measurements.
Christian Kislinger¹, Georg Daurer¹, Laurent Sieye², Stefan Schwarz¹, Martin Demuth³, Christian Gaber³, Christoph Hochenauer¹

1: Graz University of Technology, Institute of Thermal Engineering, Inffeldgasse 25/B, Graz, 8010, Austria; 2: Ugitech SA, Rue du Dr Gallet 6, Cluses, 74300, France; 3: Messer Austria GmbH, Industriestraße 5, Gumpoldskirchen, 2352, Austria

P4 Sensitivity analysis for the determination of process parameters in the utilization of biogenic residues in the open gas turbine process
Luis Wunder, Daniel Bernhardt, Michael Beckmann

Technische Universität Dresden, Germany

P5 Experimental Investigation of NOx Formation in Oxyfuel Combustion of Natural Gas- or Propane-Hydrogen Mixtures using a 20 kW Fuel Flexible High-Impulse Burner.
Franziska Ott, Svenja Harder, Nico Schmitz, Christian Wuppermann
 RWTH Aachen University, Germany

PS2: POSTER SESSIONS - SHORT PRESENTATIONS

 Location: **Nova Iorque Room**
 Chair: **Viktor Scherer**
P19 Real-Time Combustion Optimization of Hydrogen-Natural Gas Mixtures via Ultrasonic TOF Sensing
Sven Eckart^{2,3,4}, Jakob Sablowski¹, Lennart Schierling¹, Robert Kunz¹, Hartmut Krause^{2,3}, Christian Kupsch^{1,2}

1: Measurement, Sensor and Embedded Systems Laboratory (MSE Lab), TU Bergakademie Freiberg; 2: Center for Efficient High Temperature Processes and Materials Conversion, ZeHS, TU Bergakademie Freiberg; 3: Chair for Gas and Heat Technology, TU Bergakademie Freiberg; 4: Centre of Excellence for Safety Research (CESAR), VSB – Technical University of Ostrava

P20 Optical Measurement System for the High-Pressure Entrained-Flow Gasification using a Highspeed-Camera and Image Processing
Jörg Matthes¹, Max Kollmer¹, Mark Eberhard^{1,2}, Thomas Kolb¹

1: KIT, Germany; 2: ARCUS Greencycling Germany

P21 Experimental investigation of the radiation profile of inert and reactive particles in a batch reactor
Matthias Tyslik, Alexander Böse, Carl Hentschel, Martin Schiemann

Ruhr-University Bochum, Germany

P22 On-line identification of pneumatically conveyed pulverized biomass through acoustic emission sensing and VMD-based spectral analysis
Xingxing Zeng¹, Yong Yan¹, Xiangchen Qian²

1: Beihang University, China, People's Republic of; 2: North China Electric Power University, China, People's Republic of

P23 Advanced numerical modelling of thermochemical conversion in single biomass particle pyrolysis
Yuan Chen¹, Johan De Greef², Maarten Vanierschot¹

1: Department of Mechanical Engineering, Group T Leuven campus, KU Leuven, Leuven, Belgium; 2: Department of Materials Engineering, Group T Leuven Campus, KU Leuven, Leuven, Belgium

P24 Modeling Ignition and Combustion in Biomass Particle Clouds
Matteo Giesen, Daniel Bernhardt, Michael Beckmann

TU Dresden, Germany



P6 Hydrogen and Oxyfuel Combustion in Industrial Burners: Pathways to Ultra-Low NOx and High Efficiency

Nidhin Thekkedath Madhu^{1,2}, Martin Adendorff¹, Kristina Mabic¹, Rafat Hirmiz³, Esin Iplik⁴, Sven Eckart², Hartmut Krause²

1: Linde GmbH, Carl-von-Linde-Straße 25, 85716 Unterschleißheim, Germany; 2: Institute of Thermal Engineering, Technische Universität Bergakademie Freiberg, Gustav Zeuner Straße 7, 09599 Freiberg, Germany; 3: Linde Inc, 175 East Park Drive, Tonawanda NY 14150, United States; 4: Linde Sverige AB, 2-10 Varuvägen, 125 30 Älvsjö, Sweden

P7 Numerical Evaluation of Ammonia Co-firing Strategies with Coal in a 1000 MWe Wall-Firing Boiler

Seonkyo Ha¹, Woosuk Kang¹, Yunha Koo¹, Sungjae Lee¹, Changkook Ryu¹, Donggyu Kim², Sehyun Baek², Kyoungil Park²

1: Sungkyunkwan University; 2: Korea Electric Power Research Institute

P8 Low calorific gas combustion in the SI engine under oxygen enrichment

Rolandas Paulauskas, Adolfas Jančauskas, Ernest Bykov, Kęstutis Zakarauskas

Lithuanian Energy Institute, Lithuania

P9 CFD predictions of the aerodynamics of a 400 kW Grid Cone Four Hole Natural Gas Burner: Comparison with experimental NOx results for 100 and 400 kW burners.

Gordon Andrews¹, Ramon Quinonez², Ray Massey², Richard Wakeman³, Steve Smith³, Herodotos Phylaktou¹, Xueqin Chen¹

1: University of Leeds (Retired), United Kingdom; 2: Clean Burner Systems, Preston, United Kingdom; 3: Nuphant Ltd., Rugby, United Kingdom

P10 Dynamic simulation of turquoise hydrogen production using a regenerative non-catalytic pyrolysis reactor under various heat sources

Jiseon Park^{1,2}, Youngjae Lee¹, Uendo Lee¹, Won Yang¹, Jongsup Hong², Seongil Kim¹

1: Korea Institute of Industrial Technology, Korea, Republic of (South Korea); 2: Yonsei university, Korea, Republic of (South Korea)

P25 Thermal treatment of lithium batteries in a rotary kiln

Fabian Herz, Fabian Weigler, Franz Hoffmann

Anhalt University of Applied Sciences, Germany

P26 Experimental and DEM investigation in a honeycomb rotary kiln for the gentle thermal treatment of bulk materials

Jannes Hahne¹, Claudia Meitzner¹, Andreas Bück², Fabian Herz¹

1: Anhalt University of Applied Sciences; 2: Otto von Guericke University Magdeburg

P27 From oxidation to nucleation: Reactor network modeling for nanoparticle formation in laboratory-scale iron dust flames

Sören Dübal^{1,2}, Pascal Steffens², Johannes Mich², Antje Vahl², Christian Hasse², Hendrik Nicolai², Sandra Hartl¹

1: Faculty Mechanical and Systems Engineering, University of Applied Sciences Esslingen, Kanalstraße 33, 73728, Esslingen, Germany; 2: Institute for Simulation of reactive Thermo-Fluid Systems, TU Darmstadt, Otto-Berndt-Straße 2, 64287 Darmstadt, Germany

P28 An experimental study on the heat transfer characteristics of methane-iron hybrid flames

chang hee Byun, tae young Chae, jae wook Lee, won Yang

Korea Institute of Industrial Technology(Korea), Korea, Republic of (South Korea)

P29 Thermal Valorization of Industrial Iron(II) Oxalate Byproduct from Metal Pickling: Pathways to Magnetite Production and Circular Economy Applications

Antonio Fabozzi¹, Emiliano Salucci², Francesca Cerciello¹, Raouia Chaghtmi¹, Antonio D'Angelo³, Francesco Bellucci⁴, Rosa Francesca⁵, Henrik Grénman², Henrik Saxen², Martino Di Serio³, Vincenzo Russo³, Osvalda Senneca³

1: Istituto di Scienze e Tecnologia per l'Energia e la Mobilità Sostenibili (STEMS)-CNR, 80125 Napoli, Italy; 2: Department of Chemical Engineering, Åbo Akademi University, Henrikinkatu 2, 20500 Turku, Finland; 3: Department of Chemical Science, University of Naples Federico II, Via Cintia 26, 80126 Napoli, Italy; 4: CRdC Tecnologie Scarl, Via Nuova Agnano 11, 80125 Napoli, Italy; 5: Irpinia Zinco srl, Nucleo Industriale Calaggio, 83046 Lacedonia, Italy

P30 Experimental and Numerical Study on Mixing and Segregation of a Bulk of Irregularly Shaped Particles on a Batch Stoker Grate

Daria Golab, Nikoline Hilse, Martin Schiemann, Viktor Scherer

Ruhr University Bochum, Germany



P11 Flexible roof burner for hydrogen integration in steel reheating furnace

Hassan Mohanna, Sébastien Caillat
Fives Stein, France

P12 Stability, Reactive Structures, and Emissions of Pure, Partially, and Fully Cracked Ammonia in a Semi-Industrial Furnace under MILD Conditions

Ebrahim Rahman^{1,2}, Natalia Cid^{1,2,3}, M. Mustafa Kamal^{1,2}, Axel Coussement^{1,2}, Alessandro Parente^{1,2,3}, Marco Lubrano Lavadera^{1,2}

1: Aero-Thermo-Mechanics Department, Université Libre de Bruxelles, 1050, Brussels, Belgium; 2: Brussels Institute for Thermal-Fluid Systems and Clean Energy (BRITE), Université Libre de Bruxelles and Vrije Universiteit Brussel, Brussels, Belgium; 3: WEL Research Institute, Avenue Pasteur 6, 1300, Wavre, Belgium

P13 Transitioning from natural gas to hydrogen: optical and probe diagnostics of oxy-fuel combustion in a 150 kW industrial test furnace

M. Mustafa Kamal^{1,2}, Tamara Osseily^{1,2}, Tim Nowakowski³, Jörg Leicher³, Anne Giese³, Marco Lubrano Lavadera^{1,2}, Alessandro Parente^{1,2,4}

1: Université Libre de Bruxelles, Ecole Polytechnique de Bruxelles, Aero-Thermo-Mechanical Laboratory, Avenue F.D. Roosevelt 50, 1050, Brussels, Belgium; 2: Université Libre de Bruxelles and Vrije Universiteit Brussel, Brussels Institute for Thermal-fluid systems and clean Energy (BRITE) Group, Brussels, Belgium; 3: Gas- und Wärme-Institut Essen e.V. (GWI), Essen, Germany; 4: WEL Research Institute, Avenue Pasteur 6, Wavre 1300, Belgium

P14 Numerical Evaluation of MILD Hydrogen-Oxyfuel Combustion for NOx Reduction Under Air Leakage Conditions

Alex M. Garcia¹, Nico Schmitz¹, Andreas Buchholz², Esin Iplik³, Christian Wuppermann¹

1: Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, Kopernikusstr. 10, 52074 Aachen, Germany; 2: Speira GmbH, Research & Development, Georg-von-Boeselager-Str. 21, 53117 Bonn, Germany; 3: Linde Sverige AB, 2-10 Varuvägen, 125 30 Älvsjö, Sweden

P31 Development of novel resistance heating elements using innovative materials and process combinations

Luis Schrade, Dominik Büschgens, Christian Wuppermann

Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, Aachen, Germany

P32 Design and operation of a scalable fully electric three-fold hybrid heated glass melting furnace

Ralph Behrend^{1,4}, Andreas Pestel^{1,4}, Sven Eckart^{1,3,4}, Sindy Fuhrmann^{2,4}, Hartmut Krause^{1,4}

1: TU Bergakademie Freiberg, Institute of Thermal Engineering, Germany; 2: TU Bergakademie Freiberg, Institute of Glass Science and Technology, Germany; 3: Centre of Excellence for Safety Research (CESAR) Ostrava, Czech Republic; 4: TU Bergakademie Freiberg, Center for Efficient High Temperature Processes and Materials Conversion, Germany

P33 Design-Driven Operational Excellence in Submerged Arc Furnaces for Silicon and Ferroalloy Production

Valdiney Domingos de Oliveira
Si&Mex Solutions GmbH, Germany

P34 Greenhouse Gas Emissions during Sewage Sludge Combustion in Germany – Results of emission measurements at real mono-incineration plants

Min Su Sohn¹, Daniel Bernhardt¹, Michael Schinke², Michael Beckmann¹

1: Chair of Energy Process Engineering, Technical University of Dresden, George-Bähr-Straße 3b, D - 01069 Dresden, Germany; 2: ERGO Umweltinstitut GmbH, Lauensteiner Straße 42, D-01277 Dresden, Germany

P35 Development of AI Models for Predictive Operation in a Circulating Fluidized Bed Ammonia Co-Firing System

Hyunbin Jo, Sung Min Yoon, Sung Jin Park, Tae-Young Mun

Korea Institute of Energy Research, Korea, Republic of (South Korea)



P15 Characterization of the combustion behaviour of Solid Recovered Fuel under oxyfuel conditions (WOxyfuel)

Krasimir Aleksandrov¹, Gehrman Hans-Joachim¹, Vanessa Nuredin¹, Simon Simon Grathwohl², Jörg Maier², Thomas Glorius³, Dieter Stapf¹

1: Karlsruhe Institute of Technology (KIT) / Institute for Technical Chemistry, Germany; 2: University of Stuttgart / Institute of Combustion and Power Plant Technology (IFK), Germany; 3: REMONDIS Erftstadt, Germany

P16 Development and optimization of injection strategies for industrial boiler burners fed with low-boiling-point liquid fuel

Daniele Ettore^{1,2}, Lorenzo Morandi², Domenico Carucci², Tiziana Vela², Marco Torresi¹, Alessandro Saponaro³, Gianluca Rossiello²

1: Department of Mechanics, Mathematics and Management (DMMM), Polytechnic University of Bari, Via Re David, 200 – 70125 Bari, ITALY; 2: Termotecnica Industriale Srl, via Pietro Paleocapa, 1 – 20121 Milano, ITALY; 3: Centro Combustione Ambiente SpA (CCA), via Milano km 1,600 – 70023 Gioia del Colle (BA), ITALY

P17 Effects of Dimethyl ether/natural gas blends on a test rig fired by a Swirl-Stabilized Cold Air Burner

Moritz Diewald, Nico Schmitz, Christian Wuppermann

Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, Germany

P18 Ultra-low NOx Combustion Retrofit of Heavy Crude Oil Heater

Mark Hannum¹, Bruce Osman², Douglas Nichols²

1: Fives North American Combustion, United States of America; 2: Cenovus Energy

2:45pm

PS3: POSTER SESSION

-
4:05pm

Location: **Costa Verde Room Foyer**

4:05pm

COFFEE BREAK

-
4:35pm

Location: **Costa Verde Room Foyer**



4:35pm
-
5:55pm

7. H2 1: H2 1

Location: **Costa Verde Room**

Chair: **David Honoré**

Impact of hydrogen combustion on NOx emissions – physical and regulatory aspects

Jörg Leicher, Anne Giese

Gas- und Wärme-Institut Essen e.V., Germany

Experimental Study of the Impact of Fuel Velocity on a Self-Recuperative Burner in a PP-type Radiant Tube Operating on Natural Gas and Hydrogen

Elsa Busson¹, Matthias Sanders¹, Meinhard Mühlbach², Nico Schmitz¹, Joachim G. Wünnig², Christian Wuppermann¹

1: RWTH Aachen University, Department for Industrial Furnaces and Heat Engineering, Germany; 2: WS Wärmeprozessstechnik GmbH

Performance Evaluation of Hydrogen and Hydrogen/Natural Gas Blends Combustion in an Industrial-Scale Aluminum Reverberatory Furnace

Louis Piguard¹, Andreas Koeppen², Esin Iplik², Nico Schmitz⁴

1: Constellium Technology Center, Parc Economique Centr'alp CS10027, Voreppe 38341 cedex, France; 2: Endress+Hauser SICK GmbH+Co.KG | Gisela-Sick-Straße 1 | 79276 Reute | Germany; 3: Linde Technology, Metals Combustion & Energy EMEA, Varuvägen 2 125 30 Älvsjö - Sweden; 4: Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, 52074 Aachen, Germany

Development of novel additively manufactured ceramic hydrogen burner components for innovative energy efficiency strategies

Jerome Michel¹, Daniel Bernhardt¹, Hans-Peter Martin², Katrin Schönfeld², Steffen Dahms³, Michael Beckmann¹

1: Technical University Dresden, Chair of Energy Process Engineering, Germany; 2: Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany; 3: Günter Köhler Institute for Joining Technology and Materials Testing GmbH, Jena, Germany

8. POLL 1: Pollution1

Location: **Nova Iorque Room**

Chair: **Brad Travis Rawlins**

NOx emission reduction through fuel staging in regenerative flat flame burners

Fabian Scheck, Ismail Gürler, Wolfgang Klein

Andritz Metals Germany GmbH, Germany

CFD modelling of NOx emission for combustion in a coke-oven-battery: simplified vs detailed approach

Daniele Ettore^{1,2}, Tiziana Vela¹, Marco Torresi¹, Alberto Campodonico³, Alberto Vicentini³, Gianluca Rossiello²

1: Department of Mechanics, Mathematics and Management (DMMM), Polytechnic University of Bari, Via Re David, 200 – 70125 Bari, ITALY; 2: Termotecnica Industriale Srl, via Pietro Paleocapa, 1 – 20121 Milano, ITALY; 3: Centro Combustione Ambiente SpA (CCA), via Milano km 1,600 – 70023 Gioia del Colle (BA), ITALY

Novel modular fixed bed combustion system to investigate NO reduction by biomass char

Thomas Bertus, Théodore Graul, Eduardo Cano-Pleite, Antonio Soria-Verdugo, Andrés Anca-Couce

Universidad Carlos III de Madrid, Spain

Thermal energy storage technologies for the thermoprocessing and process industries, a review

Benedikt Bender¹, Torsten Seidel², Ritesh Saw¹, Siri Harboe-Minwegen¹, Sangeetha Ramaswamy¹, Dagmar Kuckelberg¹

1: OWI Science for Fuels gGmbH, Germany; 2: Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden Branch, Germany

9. FUR 1: Furnaces 1

Location: **Porto Room**

Chair: **Mark Hannum**

Numerical investigation on the influence of burner geometry on the particle formation in an industrial spray roasting reactor

Linus Poelling, Alisa Gyubbenet, Martin Schiemann

Institute of Energy Plant Technology, Germany

Experimental investigation of heat penetration and drying efficiency for expanded clay in a rotary kiln

Claudia Meitzner¹, Fabian Herz¹, Ekehard Specht²

1: Anhalt University of Applied Sciences; 2: Otto von Guericke University Magdeburg

CFD and experimental investigation of pulsed fluidization for a novel pyrolysis technology for increasing alternative fuel utilization in cement production

Mohamadali Mirzaei¹, Morten Pedersen², Varun Kumar S³, Hao Wu¹

1: Technical University of Denmark (DTU), Department of Chemical and Biochemical Engineering; 2: FLSmidth Cement A/S; 3: Indian Institute of Technology

Toward a reliable design methodology for CaL calciners based on pilot-scale CO₂ capture operations

Martin Greco-Coppi, Jochen Ströhle, Bernd Epple

Technical University of Darmstadt, Institute for Energy Systems and Technology, Germany



Thursday, 09/Apr/2026

8:30am - 9:20am KEYNOTE LECTURE III

Location: **Costa Verde Room**Anne Tretau - Material Research and Testing Institute Weimar, Germany
"Decarbonization technologies in the European brick and tile industry"9:25am - 10:45am **10. AMM 2: Ammonia 2**
Location: **Costa Verde Room**
Chair: **Changkook Ryu****Development of an optimized concept for the combustion of ammonia in industrial burner systems****Bernd Feller¹**, Marcel Biebl¹, Anne Giese¹, Christoph Wieland^{1,2}

1: GWI Essen e.V., Hafenstraße 101, 45356 Essen, Germany; 2: Chair of Energy Process Engineering and Energy Systems, University of Duisburg-Essen, Leimkugelstraße 10, 45141 Essen, Germany

Ammonia in industrial burners: Experimental investigation of the direct energetic utilisation**Klara Frey^{1,2}**, Christof Weis¹, Dimosthenis Trimis²

1: DVGW Research Center at Engler-Bunte-Institut of Karlsruhe Institute of Technology (KIT), Germany; 2: Karlsruhe Institute of Technology, Engler-Bunte-Institute Combustion Technology, Germany

An experimental study on the characteristics of NOx emission using a pilot-scale coal/ammonia co-firing combustion system**Tae young Chae, Won Yang, Jae wook Lee, Seong hwan Hwang**

Korea institute of industrial technology, Korea, Republic of (South Korea)

Experimental Study on NOx Emission Characteristics Using a 100 kWth Ammonia Combustion Burner**Seonghwan Hwang^{1,2}**, Taeyoung Chae¹, Jae Wook Lee¹, Won Yang¹, Oh Chae Kwon²

1: Korea Institute of Industrial Technology, Cheonan, Republic of Korea; 2: School of Mechanical Engineering, Sungkyunkwan University, Suwon, Republic of Korea

10:45am - 11:15am

COFFEE BREAKLocation: **Costa Verde Room Foyer****11. MET 2: Metals 2**
Location: **Nova Iorque Room**
Chair: **Hartmut Matthias Krause****Preliminary Investigations of Iron Fuel Combustion in a Semi-Industrial Combustion Chamber****Dominik König, Balte Johnen, Falko Marx, Jochen Ströhle, Bernd Epple**

TU Darmstadt, Germany

IRON AS H₂ VECTOR: A MORE ENVIRONMENTALLY SUSTAINABLE PATHWAY FOR SAFE AND SCALABLE HYDROGEN TRANSPORT?**Fulvia Iannotta¹**, Andrea Paulillo¹, Sebastian Schmitt², Antonio Coppola³, Osvalda Senneca³, Viktor Scherer², Oğuzhan Narin², Roberto Chirone¹

1: eLoop, Italy; 2: Doosan Lentjes, Germany; 3: Institute of Sciences and Technologies for Sustainable Energy and Mobility of National Research Council, STEMS-CNR, Italy; 4: Department of Mechanical Engineering, Ruhr-University (RUB), Germany

Mathematical modeling of Iron oxide reduction using extended three Interface Random pore model:**Antonio D'Angelo, Emiliano Salucci, Vincenzo Russo, Martino Di Serio, Henrik Grenman, Henrik Saxon**

abo akademi, Finland

Automated furnace tuning for temperature uniformity for heat treating metals**Benjamin Witoff, Justin Dzik, Mark Hannum**

Fives North American Combustion, United States of America

12. ELE 2: Electrification 2
Location: **Porto Room**
Chair: **Sven Eckart****Plasma-Assisted Fuel-Flexible Combustion: Advancing Sustainable Heat Generation for the Glass Industry****Nerijus Striūgas, Andrius Tamošiūnas**

Lithuanian Energy Institute, Lithuania

Prediction of Limestone Decomposition Using Microwave Heating**Sofia Gonçalves^{1,3}**, Duarte Albuquerque², José C. F. Pereira¹

1: Instituto Superior Técnico, Portugal; 2: NOVA School of Science and Technology, Portugal; 3: ITACA, Instituto Universitario de Tecnologías de la Información y Comunicaciones, Universitat Politècnica de València, Spain

Impact of Geometry and Radiative Effects on Thermal Performance of Electric Resistance Heating Elements in Convective-Dominated Systems**Julius Wilker, Dominik Büschgens, Christian Wuppermann**

Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, Aachen, Germany

Determination of the Lifetime of Heating Elements for Hybrid Heating Systems**Christoph Grimme¹**, Frans Kremer², Ceyhun Oskay¹, Dagmar Kuckelberg², Prithviraj Phadnis², Siri Harboe-Minwegen², Mathias Galetz¹

1: DECHEMA-Forschungsinstitut, Theodor-Heuss-Allee 25, 60486 Frankfurt am Main; 2: OWI Science for Fuels, Kaiserstraße 100, 52134 Herzogenrath, Deutschland



11:15am - 12:35pm	13. BIO 2: Biomass 2 Location: Costa Verde Room Chair: Andrea Dernbecher	14. CCS 2 (oxy): CCS2 (oxy) Location: Nova Iorque Room Chair: Mario Ditaranto	15. PLA 2: Plastics 2 Location: Porto Room Chair: Mattia Bissoli
	Air-Steam Gasification of Biomass in a Fluidized Bed Reactor: Application Potential for Industrial Burner Systems Sabine Reiss, Christian Wondra, Peter Treiber, Jürgen Karl Friedrich-Alexander-University Erlangen-Nuernberg, Germany	Oxyfuel process for CO₂ capture during waste incineration - effects on the operation of waste incineration plants Qiu Lu, Daniel Bernhardt, Yushuo Wang, Michael Beckmann Technische Universität Dresden, Germany	Pyrolysis of glass-fiber-reinforced polymers: FTIR gas analysis and mechanical properties of recovered fibers Stefan Pielsticker, Sascha Roeske, Wilko Rohlf, Reinhold Kneer RWTH Aachen - Institute of Heat and Mass Transfer
	Fate of nitrogen upon thermal conversion of terrestrial and marine nitrogen rich biomasses in fixed bed reactors Renata Migliaccio ¹ , Ding Jiang ² , Raouia Chaghtmi ¹ , Maria Maddalena Oliano ¹ , Assia Maaoui ¹ , Francesca Cerciello ¹ , Carmela Russo ¹ , Barbara Apicella ¹ , Shuang Wang ² , Osvolda Senneca ¹ 1: Istituto di Scienze e Tecnologia per l'Energia e la Mobilità Sostenibili, Consiglio Nazionale delle Ricerche, 80125 Naples, Italy; 2: School of Energy and Power Engineering, Jiangsu University, Zhenjiang 212013, Jiangsu, China	Full-loop Oxy-fuel Combustion Simulations of 30 MWth CIUDEN CFB Boiler Oguz Kaan Onay ¹ , Ruth Diego Garcia ² , Alberto Gómez-Barea ² , Chungun Yin ¹ 1: Aalborg University (AAU), Denmark; 2: Fundacion Ciudad de la Energia (CIUDEN), Spain	Storage Stability of Plastics Pyrolysis Oils from Post Consumer Polyolefin Waste Paul Vincent Schell ¹ , Grazyna Straczewski ¹ , Salar Tavakkol ¹ , Jochen Schütz ² , Dieter Stapf ¹ 1: Karlsruhe Institute of Technology, Institute of Technical Chemistry, Germany; 2: DVGW Research Center at Engler-Bunte-Institut of Karlsruhe Institute of Technology (KIT), Germany
	Maximizing Carbon-rich Product Yield from Bioresources via an Innovative Two-stage Pyrolysis Yasemin Gokyildiz, Marcelo Dal Belo Takehara, Kentaro Umeki Luleå Technical University, Sweden	Assessment of Fast and Finite-Rate Chemistry Models for Hydrogen-Enriched Natural Gas Oxy-Fuel Combustion in a Semi-Industrial Furnace Tamara Osseily ^{1,2} , Lorenzo Giuntini ^{1,2} , Alessandro Piscopo ^{1,2,3} , Jörg Leicher ⁴ , Tim Nowakowski ⁴ , Anne Giese ⁴ , M. Mustafa Kamal ^{1,2} , Marco Lubrano Lavadera ^{1,2} , Alessandro Parente ^{1,2,5} 1: Université Libre de Bruxelles, Ecole Polytechnique de Bruxelles, Aero-Thermo-Mechanical Laboratory, Avenue F.D. Roosevelt 50, 1050, Brussels, Belgium; 2: Université Libre de Bruxelles and Vrije Universiteit Brussel, Brussels Institute for Thermal-fluid systems and clean Energy (BRITE) Group, Brussels, Belgium; 3: University of Mons, Thermal Engineering & Combustion Unit, Rue de l'Épargne 53, Mons, 7000, Belgium; 4: Gas- und Wärme-Institut Essen e.V. (GWI), Essen, Germany; 5: WEL Research Institute, Avenue Pasteur 6, Wavre 1300, Belgium	Process development and evaluation in chemical recycling: Reintegration of high-value chemicals from complex waste streams Philip Biessey Ruhr University Bochum, Germany
	Catalytic Filters for Particulate Emissions Reduction in Biomass Combustion Oday Hakami, Amanda Lea-Langton, Arthur Garforth, Daniel Wilson School of Engineering, University of Manchester, United Kingdom	Experimental Study on Stabilisation of High-Pressure CO₂-diluted Swirled CH₄-Oxyflames in a Coaxial Burner Hugo Samson, Jérôme Bonnety, Ronan Vicquelin, Christopher Betrancourt, Clément Mirat Université Paris-Saclay, CNRS, CentraleSupélec, Laboratoire EM2C, 91190, Gif-sur-Yvette, France	Fate of Additives & Contaminants in Chemical Recycling of Plastic Jean-Bernard MICHEL Humana Consulting, Switzerland
12:35pm - 1:50pm	LUNCH Location: Restaurant O Jardim		



KEYNOTE LECTURE IV

1:50pm

Location: **Costa Verde Room**

Christian Wuppermann - RWTH Aachen University, Germany

-

2:40pm

"A resilient, climate neutral industry and a stable power grid – potential for the flexible use of energy carriers in the thermo-process industry and subsequent research demands"

2:45pm

16. H2 2: H2 2Location: **Costa Verde Room**

-

4:05pm

Chair: **Joachim Wuenning****Design of a lab-scale plant for the hydrogenation and dehydrogenation of liquid organic hydrogen carriers (LOHC)****Leonardo Veronesi^{1,2}, Salvatore Oricchio¹, Marco Pellegrini², Alessandro Guzzini², Zoe Stadler¹, Cesare Saccani²**

1: IET Institut für Energietechnik, OST Ostschweizer Fachhochschule, Switzerland; 2: Department of Industrial Engineering, University of Bologna, Italy

Operating experience with an industrial steam generator converted to Hydrogen Rich Gas operation**Samir Nasri, Wolfgang Timm, Sven Löwen, Bernhard Zimmermann**
Power Service Solutions GmbH, Germany**Numerical Investigation of Radiative Heat Transfer in Turbulent Hydrogen-Enriched Flames****Hamid Shafiee¹, Pedro J Coelho², Edgar C Fernandes³**

1: IN+, Mechanical Engineering Department, Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal; 2: IDMEC, Mechanical Engineering Department, Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal; 3: IN+, Mechanical Engineering Department, Instituto Superior Tecnico, Universidade de Lisboa, Lisbon, Portugal

Decarbonizing ceramic firing: assessing electricity and Hydrogen as alternative energy sources**Ines Rondao¹, Luc Henriet¹, Nuno Vitorino², Pedro Frade¹, Marisa Almeida¹**

1: Technological Centre of Ceramic and Glass (CTCV), iPark - Lote 7, 3040-540 Coimbra, Portugal; 2: Induzir - Indústria e Comércio de Equipamentos Lda., Zona Ind. da Jardeira, lote 23, 2440-474 Batalha, Portugal

4:30pm

-

8:00pm

TOUR: Wine Cellar Visit Porto**17. MON 1: Monitoring 1**Location: **Nova Iorque Room**Chair: **Katharina Beck****Deriving Degradation Drivers in Electrical Heating Wires Through Model-agnostic Post-hoc Analysis****Simon Mählkvist^{1,2}, Wilhelm Söderkvist Vermelin^{2,3}, Thomas Helander¹, Konstantinos Kyprianidis²**

1: Kanthal AB, Sweden; 2: Mälardalen University; 3: RISE Research Institutes of Sweden

When Additive Meets Flame: Methane-Hydrogen-Flame exhaust exposure of AM Al₂O₃ at High Temperatures**Deepak Varma Thota¹, Florian Kerber², Sven Eckart¹, Hartmut Krause¹, Christos Aneziris²**

1: Chair for Gas and Heat Technology, Institute of Thermal Engineering, TU Bergakademie Freiberg, Gustav-Zeuner-Straße 7, 09599 Freiberg, Germany; 2: Institute of Ceramics, Refractories and Composite Materials, TU Bergakademie Freiberg, Agricolastraße 17, 09599 Freiberg, Germany

Efficient Modelling of Creep Deformation in Radiant Tubes for the Lifetime Optimization under Cyclic Thermal Operating Conditions**Nicolas Dinsing, Nico Schmitz, Christian Wuppermann**

Department for Industrial Furnaces and Heat Engineering, RWTH Aachen University, Germany

Analysis of the transient axial solid transport in rotary kilns**Haozhi Jie, Fabian Herz**

Anhalt University of Applied Sciences, Germany

18. FUR 2: Furnaces 2Location: **Porto Room**Chair: **Hao Wu****Using system modeling to reduce greenhouse gas emissions in the thermoprocess industry****Benedikt Bender, Mohammad Dany, Prithviraj Phadnis**
OWI Science for Fuels gGmbH, Germany**CFD-based design of a new 50 MW Low-NOx burner for refinery gas with validation against full scale testing****Daniele Ettore^{1,2}, Lorenzo Morandi², Domenico Carucci², Tiziana Vela², Marco Torresi¹, Alessandro Saponaro³, Gianluca Rossiello²**

1: Department of Mechanics, Mathematics and Management (DMMM), Polytechnic University of Bari, Via Re David, 200 – 70125 Bari, ITALY; 2: Termotecnica Industriale Srl, via Pietro Paleocapa, 1 – 20121 Milano, ITALY; 3: Centro Combustione Ambiente SpA (CCA), via Milano km 1,600 – 70023 Gioia del Colle (BA), ITALY

Development of a scenario-based forecasting model using deep learning for optimizing attemporator spray water flow in a coal-fired boiler**Yunha Koo¹, Hyunbin Jo², Arong Jang³, Changkook Ryu¹**

1: Sungkyunkwan university, Korea, Republic of (South Korea); 2: Korea Institute of Energy Research, Korea, Republic of (South Korea); 3: Korea Midland Power, Korea, Republic of (South Korea)

How Slag Temperature Governs Gas–Slag Interfacial Reactions in Zinc Recovery in a Slag Fuming Furnace**Mehrdad Mesgarpour¹, Konstantinos G. Kyprianidis¹, Rebei Bel Fdhila^{1,2}**

1: School of Business, Society and Engineering, Mälardalens University, Universitetsplan 1, 722 20, Västerås, Sweden; 2: Hitachi Energy Research, Forskargränd 7, 72178 Västerås, Sweden



Date: Friday, 10/Apr/2026

KEYNOTE LECTURE V

8:30am Location: **Costa Verde Room**
- Sandra Gaspar - KÜTTNER, France

9:20am "Innovating the cupola furnace and beyond: Decarbonising foundry processes through new fuels, new materials, and circular metallurgy"

9:25am **19. AMM 3: Ammonia 3**
- Location: **Costa Verde Room**
10:45am Chair: **Amanda Lea-Langton**

Recent progress in hydrogen and ammonia combustion for zero-emission boilers and furnaces

Subith Vasu, Ramees Rahman, Justin Urso, Michael Pierro
CATER, UCF, United States of America

Heat Transfer Characteristics of Ammonia Combustion in Industrial Furnaces

Giovanni Battista Ariemma¹, Giancarlo Sorrentino¹, Giuseppe Langella², Pino Sabia¹, Raffaele Ragucci¹, Mariarosaria de Joannon¹

1: Istituto di Scienze e Tecnologie per l'Energia e la Mobilità Sostenibili (STEMS)- C.N.R.; 2: Department of Industrial Engineering - University of Naples "Federico II"

Partially cracked ammonia burner

Carlos-Eduardo Bibow-Correa^{1,2}, Christine Rousselle¹, Pierre Brequigny¹, Bruno Moreau¹, Fabien Halter²

1: University of Orleans, France; 2: CNRS, Orleans, France

High pressure combustion of ammonia blends with industrial gas turbine burners

Mario Ditaranto, Inge Saanum
SINTEF Energy Research, Norway

20. MET 3: Metals 3
Location: **Nova Iorque Room**
Chair: **Osvalda Senneca**

Influence of recuperative H₂-burners on the operational characteristics of a light metal melting furnace - Experimental data and digital twin predictions

Valerie Grimm¹, Thiemo Kohn³, Paul Kiska¹, Ralph Behrend¹, Sven Eckart^{1,2}, Joachim Wünnig³, Hartmut Krause¹

1: TU Bergakademie Freiberg, Germany; 2: Centre of Excellence for Safety Research (CESAR) Ostrava, Czech Republic; 3: WS Wärmeprozess-technik GmbH Renningen, Germany

Design and Process Optimization for Fines Reduction in High-Carbon Ferrochrome Production via Submerged Arc Furnace

Valdiney Domingos de Oliveira
Si&Mex Solutions GmbH, Germany

From natural gas to hydrogen: a seamless transition for sustainable steel production

Mattia Bissoli, Davide Astesiano, Salvatore Nardi, Matteo Bianchi, Enrico Malfa
Tenova, Italy

Lab-scale oxidation trials for evaluation of dimethyl ether as a replacement for fossil fuels in steel reheating furnaces

Gustav Häggström, Esraa Hamdy Mohamedin, Babak Ghazian, Andrea Olivas
Swerim AB, Sweden

21. ELE 3: Electrification 3
Location: **Porto Room**
Chair: **Nerijus Striugas**

Electrification Pathways for Industrial Heat: A Strategic Portfolio by the Babcock Wanson Group

Mattia Orlando¹, Gijs Schimmel⁵, Gaetan Claret², Gaetan De Viti², Peter Lemmen³, Martin Løvland⁴, Johan Olivier², Daan Scheepens⁵, Stephan Schimmel⁵, Christopher Schmitz³, Cecilia Sebastiani¹, Geert van de Weijer⁵

1: Babcock Wanson Italiana S.p.A., Italy; 2: Babcock Wanson France S.A.S., France; 3: VKK Standardkessel Köthen GmbH / VKK Standardkessel Service Köthen GmbH, Germany; 4: Parat Halvorsen AS, Norway; 5: Standard Fasel B.V., The Netherlands

Pilot-scale demonstration of a 0.7 t/h electrified continuous annealing furnace for steel-strip processing in a hot-dip galvanizing line

Hookyung Lee^{1,2}, Eun Kyung Lee¹, Woo-Nam Jung^{1,3}, Chang Bog Ko¹, Dae Keun Lee¹, Jinheon Choi^{1,4}, Kyeong Cheol Baik⁵, Min Jong Kang⁵

1: Korea Institute of Energy Research, Korea, Republic of (South Korea); 2: University of Science and Technology, Korea, Republic of (South Korea); 3: Korea Advanced Institute of Science and Technology, Korea, Republic of (South Korea); 4: Korea University, Korea, Republic of (South Korea); 5: SAMWOOECO Co. Ltd., Korea, Republic of (South Korea)

Industrial reheating furnace modelling: Impact of partial electrification on products

Jetnis Avdijaj^{1,2}, Pratibha Biswal^{1,2}, Alessandro Parente^{1,2,3}, Axel Coussement^{1,2}

1: ATM, École Polytechnique de Bruxelles, Université libre de Bruxelles (ULB), Brussels, Belgium; 2: Brussels Institute for Thermal-fluid systems and clean Energy (BRITE), Brussels, Belgium; 3: WEL Research Institute, Avenue Pasteur, 6, 1300 Wavre, Belgium

Part-electrification of a shuttle kiln

Denny Mathew Alex, Rigo Giese
Institut für Ziegelforschung Essen e.V.



10:45am

COFFEE BREAK

-

Location: **Costa Verde Room Foyer**

11:15am

11:15am

22. MON 2: Monitoring 2Location: **Costa Verde Room**

-

Chair: **Fabrizio Scala**
New Features for Image-Based Classification of Refuse-Derived Fuel Particles in a Rotary Kiln Environment

Markus Vogelbacher¹, Nils Bever¹, Miao Zhang¹, Krasimir Aleksandrov², Hans-Joachim Gehrman², Jörg Matthes¹

1: Institute for Automation and Applied Informatics (IAI), Karlsruhe Institute of Technology (KIT), Germany; 2: Institute for Technical Chemistry (ITC), Karlsruhe Institute of Technology (KIT), Germany

Application of an AI-supported system for waste stream analysis – from waste delivery to influencing combustion control – in the environment of Critical Infrastructure

Martin Zwiellehner

SAR Group, Process- and Environmental Technology, Germany

Design of a novel data-driven model for advanced combustion control in Waste-to-Energy furnace systems

Wouter Meynendonckx¹, Mathias Verbeke^{2,3}, Mariya Ishteva⁴, Pieter Jan Jordens⁵, Nick Alderweireldt⁵, Johan De Greef¹

1: Department of Materials Engineering, Group T Leuven Campus, KU Leuven, Leuven, Belgium; 2: DTAI, Department of Computer Science, Bruges Campus, KU Leuven, Belgium; 3: Flanders Make@KU Leuven, Belgium; 4: NUMA-ADVISE, Department of Computer Science, Geel Campus, KU Leuven, Belgium; 5: Indaver NV, Belgium

Pulverized Fuel Injection Monitoring of Blast Furnaces through Digital Imaging and Image Processing

Da Chen¹, Yong Yan², Beining Shang³

1: North China Electric Power University, China, People's Republic of; 2: Beihang University, China, People's Republic of; 3: Changning Ltd, United Kingdom

12:35pm

-

1:50pm

LUNCHLocation: **Restaurant O Jardim****23. CCS 3 (CO2): CCS3 (CO2)**Location: **Nova Iorque Room**Chair: **Louis Ricci**
Sorption-enhanced CO2 methanation in a lab-scale fluidized bed using zeolite sorbents

Fiorella Massa¹, Antonio Coppola¹, Roberto Ruggiero², Fabrizio Scala²

1: STEMS, CNR, Italy; 2: Università di Napoli Federico II, Italy

An experimental study on methane and biogas oxyflames under CO2 dilution for CCS applications

Laura Pirateque-Henao, Bertrand Lecordier, Corine Lacour, Armelle Cessou, David Honoré

CORIA, CNRS, UNIROUEN, INSA Rouen, Normandie University

Decreasing Excess Air in Energy from Waste Modernization Projects to Improve the Performance of Carbon Capture

Marcel Richter¹, Georg Kränzel¹, Tobias Kühlewind¹, Max Schönsteiner¹, Axel Hanenkamp¹, Ulrich Martin¹, Stefan Ringmann²

1: Martin GmbH für Umwelt- und Energietechnik, Germany; 2: KVA Linth, Switzerland

Experimental and Numerical Investigation of a Low-NOx Oxy-Fuel Burner

Namsu Kim, Yong Tae Guahk, Dongmyung Seo, Seung-gon Kim, Seungjae Lim

Korea Institute of Energy Reserach, Korea, Republic of (South Korea)

24. CRC: CRCLocation: **Porto Room**Chair: **Viktor Scherer**
Potentials of microwave heating for industrial applications

Felix Faber¹, Lucas Kleine¹, Jan-David Griesche⁴, Lucas Briest¹, Jan Barowski², Alba Diéguez Alonso³, Nicole Vorhauer-Huget¹

1: Otto von Guericke University Magdeburg, Germany; 2: Ruhr University Bochum, Germany; 3: TU Dortmund, Germany; 4: K+S Minerals and Agriculture GmbH, Germany

Pore-informed particle model: decoupling intra-particle transport and reaction during biomass pyrolysis

Fabienne Ryll, Andrea Dernbecher, Alba Dieguez-Alonso

Technische Universität Dortmund, Faculty of Biochemical and Chemical Engineering, Laboratory of Transport Processes, Emil-Figge-Str. 68, 44227 Dortmund, Germany

Numerical investigation on the influence of anisotropic transport properties on the pyrolysis of wood particles

Nikoline Hilse, Martin Schiemann, Viktor Scherer

Ruhr University Bochum, Germany

Development of a Mesh Based Char Combustion Model for DEM/CFD-Simulations

Carl Hentschel, Enric Illana Mahiques, Nikoline Hilse, Viktor Scherer

Ruhr-Universität Bochum, Germany



1:50pm

KN6: KEYNOTE LECTURE VILocation: **Costa Verde Room**-
2:40pm

Jacobco Porteiro - University of Vigo, Spain

"New trends in CFD modeling of the fixed bed combustion of biomass"

2:45pm

25. H2 3: H2 3Location: **Costa Verde Room**-
4:05pmChair: **Jörg Leicher****Stability and Emissions Characteristics of Syngas and Hydrogen Non-Premixed Flames****Housna IDRISSE**^{1,2}, **Najoua LABJAR**², **Souad EL HJJAJI**³, **Mohamed ASBIK**⁴, **Toufik BOUSHAKI**¹

1: CNRS ICARE, Orléans, France; 2: LS3MN2E, CERNE2D, ENSAM, Mohammed V University in Rabat, Morocco; 3: LS3MN2E, CERNE2D, Faculty of Sciences, Mohammed V University in Rabat, Morocco; 4: ERTE, ENSAM, Mohammed V University in Rabat, Morocco

NOx Emissions for a Rich/Lean Dual Fuel Hydrogen/Natural Gas Grid Cone Industrial Burner: the Influence of Air Flow Pressure Loss.**Gordon Andrews**¹, **Ramon Quinonez**², **Ray Massey**², **Francis Olanrewaju**², **Richard Wakeman**³, **Steve Smith**³, **Herodotos Phylaktou**¹, **Xueqin Chen**¹

1: University of Leeds (Retired), United Kingdom; 2: Clean Burner Systems Ltd., Preston, United Kingdom; 3: Nuphelt Ltd., Rugby, United Kingdom

How does H2 Combustion affects industrial processes: a detailed investigation**Jean Caudal**, **Jean-Baptiste Sénéchal**, **Mohand Amirat**, **Görkem Öztarlık**, **Nicolas Riaute**, **Chaimae Bariki**

Air Liquide R&D, 1 chemin de la Porte des Loges, 78350 Jouy-en-Josas, France

High-efficiency hydrogen-compatible combustion system for radiant tube furnaces**Hassan Mohanna**, **Sébastien Caillat**
Fives Stein, France

4:05pm

COFFEE BREAK-
4:35pmLocation: **Costa Verde Room Foyer****26. MON 3: Monitoring 3**Location: **Nova Iorque Room**Chair: **Viktor Scherer****Investigation of turbulent NG / H2 flames using optical measurement techniques****Sebastian Reichenböck**¹, **Stefan Schwarz**¹, **Georg Daurer**¹, **Martin Demuth**², **Christian Gaber**², **Christoph Hochenauer**¹

1: Graz University of Technology, Institute of Thermal Engineering, Austria; 2: Messer Austria GmbH, Austria

Development and Optimization of a Thermoacoustic Flame Monitoring System for Hydrogen-Containing Gas Combustion**Muralimohan Juttu Vidyasagar**¹, **Sven Eckart**¹, **Yohan John**², **Christoph Nailis**², **Dagmar Kuckelberg**², **Hartmut Krause**¹

1: TU Bergakademie Freiberg, Institute of Thermal Engineering (IWT), Germany; 2: OWI Science for Fuels gGmbH, Germany

Quantitative Monitoring of Burner Flames through Digital Image Processing**Weicheng Xu**, **Yong Yan**

Beihang University, China, People's Republic of

Lessons learnt from pilot and industrial scale oxyfuel burner installations**Esin Iplik**¹, **Tomas Ekman**¹, **Martin Adendorff**², **Louis Piquard**³, **Anders Lugnet**⁴, **Detlef Mackenstedt**⁵

1: Linde Sverige AB, Sweden; 2: Linde GmbH, Germany; 3: Constellium Technology Center, France; 4: Ovako Hofors, Sweden; 5: Speira Research and Development, Germany

27. FUR 3: Furnaces 3Location: **Porto Room**Chair: **Bernd Epple****Overfire air strategies for improved furnace performance in industrial bagasse-fired boilers****Brad Travis Rawlins**, **Francois Marais**, **Schalk van der Merwe**

John Thompson a division of ACTOM (Pty) Ltd, South Africa

Heat Transfer Enhancement in Three-Period Spirally Fluted Tubes for Boiler and Power Generation Applications**Hie Chan Kang**, **Dong Hyun Shin**, **Young Ha Jeon**, **Hong Ju Moon**, **Seong Gyeong Kim**

Kunsan National University, Korea, Republic of (South Korea)

PFAS in Municipal Solid Waste Incineration – Results of a Full-Scale Measurement Campaign and Significance for the Industry**Anna Holfelder**¹, **Dr.-Ing. Hans-Joachim Gehrman**¹, **Dipl.-Ing. Daniel Wohter**², **Prof. Dr.-Ing. Peter Quicker**², **Dr.-Ing. Ragnar Warnecke**³, **Prof. Dr.-Ing. Dieter Stapf**¹

1: Karlsruhe Institute of Technology (KIT), Germany; 2: RWTH Aachen University, Germany; 3: Gemeinschaftskraftwerk Schweinfurt GmbH (GKS), Germany

Advanced Furnace Technologies for Sustainable Silicon Recovery from Fluidized Bed Reactors and Kerf Silicon wastes.**Valdiney Domingos de Oliveira**
Si&Mex Solutions GmbH, Germany



4:35pm
-
5:55pm

28. H2 4: H2 4

Location: **Costa Verde Room**
Chair: **Viktor Scherer**

Hydrogen combustion and its influence on corrosion and mechanical behaviour of heat resistant steels

Chris Fritsche¹, Sven Eckart¹, Lisa Winter², Lisa-Marie Rymer², Thomas Lampke², Hartmut Krause¹

1: Professorship for Gas and Heat Technology, Institute of Thermal Engineering, TU Bergakademie Freiberg, Germany; 2: Materials and Surface Engineering Group, University of Technology Chemnitz, Germany

Numerical investigation of the operation performance of an additively manufactured H2-capable gas burner in an EAF

Christian Goßrau¹, Johannes Willkomm², Fabian Krause³, Riadh Omri⁴, Manfred Wirsum¹, Johannes Henrich Schleifenbaum², Hans-Jürgen Odenthal³, Sami Elsabagh⁴

1: Institute of Power Plant Technology, Steam and Gasturbines (IKDG), RWTH Aachen University, Mathieustraße 9, 52074 Aachen, Germany; 2: Chair of Digital Additive Production (DAP), RWTH Aachen University, Campus-Boulevard 73, 52074 Aachen, Germany; 3: SMS group GmbH, Am SMS Campus 1, 41069 Mönchengladbach, Germany; 4: Georgsmarienhütte GmbH, Neue Hüttenstraße 1, 49124 Georgsmarienhütte, Germany

A surrogate model based on Chemical Reactor Networks for hydrogen-enriched industrial furnaces

Shubham Shubham¹, Daniel Mira¹, Hassan Mohanna², Sebastien Caillat²

1: Barcelona Supercomputing Center, Spain; 2: Fives Stein, France

Effect of oxidizer during steel reheating using hydrogen in a pilot scale walking beam furnace

Joel Falk, Andreas Johnsson

SWERIM AB, Sweden

29. FUR 4: Furnaces 4

Location: **Nova Iorque Room**
Chair: **Sébastien Caillat**

CFD simulation and validation of solid and gas fuels co-injection model

Ahmad Sayed Kassem¹, Ghassan Ghazal¹, Rodolfo Santos Ferreira¹, Vikram Sundara¹, Harsh Priyadarshi¹, Phuc Danh NGUYEN¹, Xianai Huang², Ka Wing NG²

1: ArcelorMittal Global R&D, Voie Romaine, BP 30320, 57283 Maizières-lès-Metz Cedex, France; 2: CanmetENERGY, Natural Resources Canada, 1 Haanel Drive, Ottawa, ON K1A 1M1, Canada

Virtual Chemical of CH4-H2 configurations for future Large Eddy Simulation of an industrial burner

Malo Hustache^{1,2}, Nasser Darabiha¹, Nicolas Meynet², Benoît Fiorina¹

1: Université Paris-Saclay, CNRS, CentraleSupélec, Laboratoire EM2C, Gif-sur-Yvette, 91190, France; 2: ENGIE Lab Crigen, Engie, 4 Rue Joséphine Baker, 93240 Stains, France

Time-dependent thermal and chemical behavior of wood waste in a pilot packed-bed combustion reactor

Siebe Borremans¹, Jo Van Caneghem¹, Maarten Vanierschot^{2,3}, Johan De Greef¹

1: Department of Materials Engineering, Group T Leuven Campus, KU Leuven, Leuven, Belgium; 2: Department of Mechanical Engineering, Group T Leuven campus, KU Leuven, Leuven, Belgium; 3: Materials Science, Innovation and Modelling (MaSIM) Research Focus Area, North-West University, Mmabatho 2745, South Africa

New material solutions for ammonia cracking above 550°C

Katharina Beck¹, Ceyhun Oskay¹, Fausto Tidona², Lena Engelmeier², Mathias C. Galetz¹

1: DECHEMA Forschungsinstitut, Germany; 2: Zentrum für BrennstoffzellenTechnik GmbH, Germany

30. ELE 4: Electrification 4

Location: **Porto Room**
Chair: **Salar Tavakkol**

Replacing LPG with hydrogen or electric heating for secondary Aluminium profile production

Thamali Rajika Jayawickrama, Ulf Sjöström

Swerim AB, Sweden

Hybrid heated double-P radiant tubes in Hot Strip Annealing Lines for Steel

Markus Mann¹, Johannes Trabold¹, Steven Bullert², Joachim G. Wüning², Michael Keller³, Andreas Queck⁴, Bernhart Stranzinger⁴

1: Kanthal GmbH; 2: WS Wärmeprozessstechnik GmbH; 3: thyssenkrupp Steel Europe AG; 4: VDEh-Betriebsforschungsinstitut GmbH

Process development for a hybrid heating concept for highly flexible and low-CO2 billet heating in electric steel mills - FlexHybHeat -

Samarth Kulkarni, Mohamed Abohelwa, Moritz Eickhoff, Christian Wupperman

RWTH Aachen University, Germany

A Versatile CFD Framework for cross-sectoral analysis of Carbon-Neutral Furnace Design

Manuel Schieder¹, Julian Unterluggauer¹, Tilman Barz¹, Stefan Puskas², Chritsoph Zauner¹

1: AIT Austrian Institute of Technology GmbH, Austria; 2: Wienerberger AG, Austria

6:10pm
-
6:30pm

CLOSING ADDRESS

Location: **Costa Verde Room**

8:00pm

FAREWELL DINNER

Location: **Restaurant O Jardim**