

# 14th European Conference on Industrial Furnaces and Boilers (INFUB-14)

## List of Accepted Abstracts

### Australia

HEAT TRANSFER AND NOX EMISSIONS FROM HYDROGEN / NATURAL GAS FLAMES IN THIN-WALLED FURNACES

Neil L. Smith, Doug B. Proud, Paul R. Medwell, Peter Ashman  
University of Adelaide, Australia

### Austria

A NOX POSTPROCESSING METHOD FOR NON-PREMIXED AND PREMIXED FLAMES

Christoph Spijker<sup>1</sup>, Senthilathiban Swaminathan<sup>2</sup>, Harald Raupenstrauch<sup>1</sup>  
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APPLICATION OF COMPUTATIONALLY INEXPENSIVE CFD APPROACH FOR THE COMBUSTION OF SEWAGE SLUDGE POWDER IN ENTRAINED FLOW FURNACES

Benjamin Ortner<sup>1</sup>, Christian Schmidberger<sup>2</sup>, Hannes Gerhardt<sup>1</sup>, René Prieler<sup>1</sup>, Christoph Hochenauer<sup>1</sup>

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EXPERIMENTAL INVESTIGATION TOWARDS EMISSION MINIMIZATION VIA OXYGEN LANCING IN OXY-FUEL COMBUSTION OF HYDROGEN ENRICHED NATURAL GAS

Stefan Schwarz<sup>1</sup>, Georg Daurer<sup>1</sup>, Christian Gaber<sup>2</sup>, Martin Demuth<sup>2</sup>, Christoph Hochenauer<sup>1</sup>

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HOW CFD-DEM Simulations benefit from Machine Learning

Stefan Radl, Hadie Benabchiasli, Mohammadsadegh Salehi  
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HYDROGEN AS AN ALTERNATIVE FUEL IN OXY-FUEL GLASS MELTING FURNACES: A NUMERICAL STUDY OF THE FUEL SUBSTITUTION EFFECTS BASED ON COUPLED CFD SIMULATIONS

Georg Daurer<sup>1</sup>, Stefan Schwarz<sup>1</sup>, Martin Demuth<sup>2</sup>, Christian Gaber<sup>2</sup>, Christoph Hochenauer<sup>1</sup>

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NUMERICAL NOX ANALYSIS OF A PREMIXED METHANE-AIR SWIRL BURNER (TECFLAM)

Usman Ghafoor, Christoph Spijker, Harald Raupenstrauch

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POST-PROCESSING GASEOUS FRACTIONS IN CARBOTHERMAL REDUCTION OF LITHIUM-ION BATTERIES: ADVANCING BATTERY PRODUCTION THROUGH A CLOSED-LOOP RECYCLING APPROACH

Lukas Wiszniewski<sup>1</sup>, Zlatko Raonic<sup>1</sup>, Thomas Hochsteiner<sup>1</sup>, Fritz Kittinger<sup>2</sup>, Harald Raupenstrauch<sup>1</sup>

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RENEWABLE FUELS FOR DECARBONIZING INDUSTRIAL FURNACES: A TECHNO-ECONOMIC ASSESSMENT OF DIFFERENT POWER-TO-X CONCEPTS

Daniela Leibetseder, Philipp Moser, Christoph Zauner

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TRANSIENT THERMO-MECHANICAL MODELLING OF REAL-SCALE METALLURGICAL CONVERTER PREHEATING

Zlatko Raonic, Harald Raupenstrauch

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## Belgium

A MULTISCALE REACTOR NETWORK MODEL FOR GRATE-FIRED WASTE COMBUSTION FURNACES

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IMPACT OF COMBUSTION CONTROL ON HCL AND SO<sub>2</sub> PRODUCTION IN AN INDUSTRIAL WASTE-TO-ENERGY FURNACE

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NUMERICAL INVESTIGATION ON THE INFLUENCE OF THE SKID COOLANT TEMPERATURE ON THE REHEATING FURNACE PERFORMANCE

Zaaquib Yunus Ahmed<sup>1,2</sup>, Toon Demeester<sup>1,2</sup>, Ilya T'Jollyn<sup>2,3</sup>, Wim Beyne<sup>1,2</sup>, Teun De Raad<sup>1,4</sup>, Steven Lecompte<sup>1,2</sup>, Michel De Paepe<sup>1,2</sup>

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## Brazil

ENHANCING OPERATIONAL EFFICIENCY AND MITIGATING ENVIRONMENTAL IMPACT: A SUCCESSFUL COLLABORATION IN ENERGY PRODUCTION OPTIMIZATION USING ARTIFICIAL INTELLIGENCE

Marcos Cemim, Claudio Goldbach

Termica Solutions, Brazil

EVALUATION OF HYDROCARBON PRODUCTION FROM OIL INTERESTERIFICATION AND PYROLYSIS OF PLASTICS – EXPERIMENTAL, SIMULATION AND ECONOMIC EVALUATION

Hugo Gomes D'Amato Villardi, Ana Lucia Barbosa de Souza, Fernando Luiz Pellegrini

Pessoa, Jailson Bittencourt de Andrade

SENAI CIMATEC, Brazil

NUMERICAL AND EXPERIMENTAL ANALYTICAL ANALYSIS OF FINES OF THE FLUIDIZATION PROCESS OF BIOMASS FINES

André Luiz Tavares

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## Canada

ELECTRIFICATION OF INDUSTRIAL FURNACES USING THERMAL PLASMA

Pierre Carabin

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## Denmark

DIGITAL TWIN OF A 154MWTH BIOMASS SPOUT-FIRING BOILER

Margherita Dotti<sup>1</sup>, Emil Zacho Rath<sup>2</sup>, Henrik Hofgren<sup>2</sup>, Matthias Mandø<sup>1</sup>, Chungeng Yin<sup>1</sup>

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MODELLING AND PREDICTION OF SELF-HEATING AND SELF-IGNITION IN 3D STORAGE PILE OF SOLID FUELS

Yonghao Wang, Matthias Mandø, Chungeng Yin

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THE INFLUENCE OF SULFUR RECIRCULATION TECHNOLOGY ON DEPOSIT FORMATION IN A WASTE-TO-ENERGY PLANT

Wenhan Cao<sup>1</sup>, Yifan Du<sup>1</sup>, Sven Andersson<sup>2</sup>, Peter Arendt Jensen<sup>1</sup>, Peter Glarborg<sup>1</sup>, Thomas Norman<sup>3</sup>, Niels Peder Hansen<sup>4</sup>, Hao Wu<sup>1</sup>

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## France

AN EXPERIMENTAL STUDY BY LASER DIAGNOSTICS OF THE PROGRESSIVE DECARBONIZATION OF A TURBULENT BLUFF-BODY FLAME WITH HYDROGEN

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#### DEVELOPMENT OF AN OPTIMIZED TWO-STEP VIRTUAL SCHEME FOR SIMULATING DUAL FUEL CH<sub>4</sub>/H<sub>2</sub> - AIR COMBUSTION IN INDUSTRIAL FURNACES

Malo Hustache<sup>1,2</sup>, Tan-Phong Luu<sup>1</sup>, Nasser Darabiha<sup>1</sup>, Nicolas Meynet<sup>2</sup>, Benoit Fiorina<sup>1</sup>  
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#### HYDROGEN COMBUSTION BURNER FOR NON-OXIDIZING FURNACES IN STEEL PROCESSING LINES

Sébastien Caillat, Hassan Mohanna, Patrice Sedmak, Rémy Chitsaz, Yannick Murlot, Laurent Lesne  
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#### IMPACT OF CHEMICAL TREATMENTS OF PARTICLE BOARDS ON THE FATE OF NITROGEN DURING THEIR COMBUSTION

Thomas Bertus<sup>1,2</sup>, Jérôme Lemonon<sup>2</sup>, F. Javier Escudero Sanz<sup>2</sup>, Sylvain Salvador<sup>2</sup>  
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#### LARGE-EDDY SIMULATION AND EXPERIMENTAL STUDY OF A PARTIALLY PREMIXED HYDROGEN / AIR SWIRLED BURNER: IMPACT OF THE INJECTION SYSTEM

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#### NEW GENERATION BURNER FOR 0 TO 100 % HYDROGEN FLEXIBILITY IN REHEATING FURNACES

Sébastien Caillat, Hassan Mohanna, Minh Duy Le, Peter Molcan, Patrice Sedmak  
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#### ON THE COMBUSTION OF TERPENES BIOFUELS

Philippe Dagaut

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### Germany

#### 3D ANALYSIS OF THE FLIGHT BEHAVIOR OF REFUSE-DERIVED FUEL PARTICLES: PLENOPTIC CAMERA VS. STEREO CAMERA SYSTEM

Markus Vogelbacher<sup>1</sup>, Miao Zhang<sup>1</sup>, Robin Streier<sup>2</sup>, Siegmund Wirtz<sup>2</sup>, Viktor Scherer<sup>2</sup>, Jörg Matthes<sup>1</sup>

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### 3D TOMOGRAPHIC RECONSTRUCTION OF INDUSTRIAL HIGH-TEMPERATURE COMBUSTION PROCESSES

Markus Röder<sup>1</sup>, Philipp Pietsch<sup>2</sup>, Andreas Unterberger<sup>3</sup>, Fabio Martins<sup>3</sup>, Anne Giese<sup>1</sup>, Khadijeh Mohri<sup>3,4,5</sup>

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### A METHOD FOR THE COMPENSATION OF THERMAL REFLECTIONS IN RADIATION BASED TEMPERATURE MEASUREMENTS IN COMBUSTION CHAMBERS

Jörg Matthes<sup>1</sup>, Patrick Waibel<sup>1,2</sup>, Lutz Gröll<sup>1</sup>, Markus Vogelbacher<sup>1</sup>

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### A SOLUTION FOR DECARBONISATION: HYDROGEN FIRED OXYFUEL BURNERS

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### A STUDY OF THE PHOSPHORUS RELEASE POTENTIAL OF SEWAGE SLUDGE IN ENTRAINED FLOW GASIFICATION

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### AN EXPERIMENTAL AND CFD STUDY OF THE IRON ORE FIXED BED STRUCTURE AND ITS INFLUENCE ON THE DIRECT REDUCTION PROCESS

Mohammed Liaket Ali, Sven Mehlhose, Quentin Fradet, Uwe Riedel

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### ADVANCING SUSTAINABLE LIMESTONE CALCINATION IN CARBONATE LOOPING FOR CO<sub>2</sub> CAPTURE BY USING STEAM FOR ENHANCED EFFICIENCY AND EMISSION REDUCTIONS

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### CFD MODELLING OF AN 850 KW INJECTION FURNACE TO INVESTIGATE NOX EMISSIONS

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### CFD SIMULATION OF NATURAL GAS AND HYDROGEN OXYFUEL COMBUSTION: COMPARISON OF KINETIC MECHANISMS, COMBUSTION MECHANISMS AND WSGG RADIATION MODELS

Franziska Ott, Nico Schmitz, Herbert Pfeifer

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## CHARACTERIZATION OF THE IGNITION AND COMBUSTION BEHAVIOUR OF BIOGENIC RESIDUES

Matteo Giesen, Daniel Bernhardt, Michael Beckmann  
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## CHARACTERIZATION OF PULVERIZED BIOMASS BLENDS IN A DROP TUBE FURNACE

Abdou Suso, Piotr Plaza, Eva Miller, Jörg Maier, Günter Scheffknecht  
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## CHEMICAL RECYCLING OF PLASTIC WASTE VIA FLUIDIZED BED GASIFICATION AT PILOT SCALE

Fabiola Panitz, Jens Kaltenmorgen, Marc Siodlaczek, Jochen Ströhle, Bernd Epple  
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## COMBINED USE OF HYDROGEN AND REFUSE-DERIVED FUELS (RDF) IN ROTARY KILNS: A NUMERICAL STUDY ON THE INFLUENCE ON CLINKER QUALITY

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## COMBUSTION OF AMMONIA AS A CARBON-FREE FUEL FOR HEAT GENERATION - COMPARATIVE STUDIES ON ECONOMIC EFFICIENCY

Janine Wiebe<sup>1</sup>, Hans-Joachim Gehrman<sup>1</sup>, Krasimir Aleksandrov<sup>1</sup>, Dieter Stapf<sup>1</sup>, Christian Reichert<sup>2</sup>  
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## COMPARATIVE STUDIES ON THE OPERATION OF TWO INDUSTRIAL BURNERS WITH NATURAL GAS AND HYDROGEN

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## COMPARATIVE CALCULATION OF HYDROGEN ENRICHED NATURAL GAS COMPOSITION WITH DIFFERENT MODELLING AND SIMULATION SOFTWARE USING VARIED COMBUSTION PROCESS CONTROL APPROACHES

Lars Felkl<sup>1</sup>, Chris Fritsche<sup>2</sup>, Hartmut Krause<sup>2</sup>, Olaf Schwedler<sup>3</sup>, Alexandros Charitos<sup>1</sup>  
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## CREEP BENDING TESTS OF ALLOYS DURING SUPERIMPOSED THERMAL CYCLING

Siri Harboe-Minwegen  
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## DECARBONIZATION IN THE LIME INDUSTRY

Frank Ohnemueller, Marlena Wissel

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#### DESIGN AND OPERATING PARAMETERS OF A TWO-STAGE BIOMASS COMBUSTION PLANT

Valerie Grimm, Tommy Flößner, Reinhild Arnold, Ralph Behrend, Hartmut Krause

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#### DESIGN ASPECTS OF MICROWAVE HEATING AND PLASMA BURNERS FOR HIGH TEMPERATURE PROCESSES: AN OVERVIEW

Ralph Behrend, Sven Eckart, Valerie Grimm, Muralimohan Juttu-Vidyasagar, Hartmut Krause

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#### DETERMINING THE OPERATING LIMITS OF A TWO-STAGE FLAMELESS OXIDATION VIA NUMERICAL AND EXPERIMENTAL INVESTIGATIONS

Moritz Diewald<sup>1</sup>, Linda Giesler<sup>1</sup>, Nico Schmitz<sup>1</sup>, Herbert Pfeifer<sup>1</sup>, Enrico Cresci<sup>2</sup>, Joachim G. Wüning<sup>2</sup>

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#### DEVELOPMENT OF A LOW-EMISSION COMBUSTION CONCEPT FOR HYDROGEN IN MULTI-FUEL-BURNERS

Marius Philipp<sup>1</sup>, Nico Schmitz<sup>1</sup>, Herbert Pfeifer<sup>1</sup>, Albert Kowert<sup>2</sup>

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#### DIRECT NUMERICAL SIMULATION OF GASIFICATION OF A POLYPROPYLENE PLASTIC PARTICLE IN SUPERCRITICAL WATER: IMPACT OF FLOW CONDITIONS

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#### DISSEMINATION AND FUTURE RESEARCH ROAD MAP ON HEATING AND BURNER TECHNOLOGY IN INDUSTRIAL HEATING IN THE EUROPEAN STEEL INDUSTRY

Oliver Hatzfeld<sup>1</sup>, Andreas Johnsson<sup>2</sup>, Gustav Haeggstroem<sup>2</sup>, Joel Falk<sup>2</sup>, Nico Schmitz<sup>3</sup>, Elsa Busson<sup>3</sup>

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#### EFFECT OF BLENDING HYDROGEN WITH NATURAL GAS ON NOX EMISSION IN THE OXYFUEL FIRED PILOT SCALE FURNACE

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EVALUATION OF THE COMBUSTION CHARACTERISTICS OF POLYFLUORINATED ORGANIC SUBSTANCES

Hans-Joachim Gehrmann, Krasimir Aleksandrov, Andrei Bologna, Philipp Bergdolt, Vanessa Nuredin, Dieter Stapf  
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EXPERIMENTAL DETERMINATION OF QUANTITATIVE FLASH PYROLYSIS YIELDS OF POLYMETHYL METHACRYLATE (PMMA) IN A FLUIDIZED BED REACTOR

Stefan Pielsticker, Katja Hendricks, Reinhold Kneer  
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EXPERIMENTAL STUDY ON A H<sub>2</sub>/NATURAL GAS FIRED PROTOTYPE SELF-RECUPERATIVE BURNER – FUNDAMENTAL PERFORMANCE, COMBUSTION EFFICIENCY, NOX EMISSIONS

Lukas Sankowski, Nico Schmitz, Herbert Pfeifer  
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EXPERIMENTAL STUDY ON A NEW DEVELOPED HYDROGEN CONDENSING BOILER WITH SINGLE DIGIT NOX EMISSIONS

Michael Dölz<sup>1</sup>, Joachim G. Wüning<sup>2</sup>, Tobias Plessing<sup>1</sup>  
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EXPERIMENTAL INVESTIGATIONS OF THE COMBUSTION OF AMMONIA FOR DECARBONIZED PROCESS HEAT

Marcel Biebl, Jörg Leicher, Anne Giese, Klaus Görner  
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EXPERIMENTAL INVESTIGATION OF FLOW VELOCITY IN A PULSATION REACTOR

Chunliang Zhang, Stefan Günther, Stefan Odenbach  
TU Dresden, Germany

EXPERIMENTAL INVESTIGATION OF COMBUSTION CHARACTERISTICS DURING CO-COMBUSTION OF SOLID RECOVERED FUEL AND COAL IN A 1 MWTH CIRCULATING FLUIDIZED BED REACTOR

Alexander Kuhn<sup>1</sup>, Eric Langner<sup>1</sup>, Dennis Hülsbruch<sup>1</sup>, Emmi Kallio<sup>2</sup>, Alex Soderholm<sup>2</sup>, Vesna Barisic<sup>2</sup>, Jochen Ströhle<sup>1</sup>, Bernd Epple<sup>1</sup>  
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EXPERIMENTAL INVESTIGATION OF HIGH TEMPERATURE CONVERSION OF SEWAGE SLUDGE IN AN ENTRAINED FLOW REACTOR

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FLAME-PARTICLE INTERACTION INSIDE A PACKED BED OF PARTICLES: EXPERIMENTS TO VALIDATE DEM/CFD SIMULATIONS

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FUEL FLEXIBILITY IN CONTINUOUS ANNEALING LINES: INVESTIGATION OF MEASURES TO REDUCE NOX EMISSIONS IN A SELF-RECUPERATIVE BURNER RADIANT TUBE SYSTEM

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HIGH TEMPERATURE DIELECTRIC PROPERTIES MEASUREMENT FOR REFRACTORIES

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HOLISTIC MODEL OF THE RELEASE OF ALKALI COMPOUNDS FROM BIOMASS AND THEIR INCLUSION IN ADDITIVES

Hendrik Mörtenkötter, Marco Bauer, Thorben de Riese, Sebastian Fendt, Hartmut Spliethoff

NUMERICAL SIMULATION OF NATURAL GAS - HYDROGEN MIXTURES IN FLAMELESS COMBUSTION

Alex M. Garcia, Johannes Losacker, Lukas Sankowski, Nico Schmitz, Herbert Pfeifer

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HYDROGEN ADMIXTURE ON A NATURAL GAS-OXYGEN BURNER FOR GLASS-MELTING PROCESS

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IMPROVEMENT OF RDF CONVERSION MODELS TO SIMULATE A CEMENT ROTARY KILN UNDER SUPER-STOICHIOMETRIC OXY-FUEL CONDITIONS

Robin Alexander Streier<sup>1</sup>, Rafael Solana Gómez<sup>2</sup>, Reinhold Kneer<sup>2</sup>, Ines Veckenstedt<sup>3</sup>, Anica Vogel<sup>3</sup>, Thomas Deck<sup>3</sup>, Karl Lampe<sup>3</sup>, Viktor Scherer<sup>1</sup>

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INFLUENCE OF HYDROGEN COMBUSTION ON HIGH-TEMPERATURE MATERIALS IN THERMOPROCESSING TECHNOLOGY

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#### INFLUENCE OF FLIGHTS AND CROSS FIXTURES ON THE HEAT TRANSFER SURFACES IN ROTARY KILNS

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#### INFLUENCE OF POWER, TEMPERATURE AND RESIDENCE TIME IN MICROWAVE-ASSISTED PYROLYSIS OF CFRP COMPOSITES

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#### INFRARED MEASUREMENTS AT BOILERS

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#### INVESTIGATION OF NOX EMISSIONS FROM BIOMASS COMBUSTION IN A DROP-TUBE LAB-SCALE REACTOR

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#### INVESTIGATION OF THE EFFECT OF PNEUMATIC CONVEYING ON COMMINATION OF WOOD PELLETS: INFLUENCE OF SILO TRUCK PARAMETERS

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#### INVESTIGATION OF HEAT TRANSFER CHARACTERISTICS OF OXYFUEL COMBUSTION IN A SEMI-INDUSTRIAL FURNACE USING NATURAL GAS/HYDROGEN BLENDS

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#### OPTICAL PULSATION MEASUREMENT OF HYDROGEN MIXTURES

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#### INVESTIGATIONS OF RADIANT TUBE ARRANGEMENTS AND THEIR EFFECT ON RADIATION EXCHANGE IN HORIZONTAL FURNACES

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#### INVESTIGATION ON THE PYROLYSIS BEHAVIOR OF PLASTIC MIXTURES TO ADVANCE IN THE DEVELOPMENT OF ROBUST CHEMICAL RECYCLING TECHNOLOGIES

Jakob Seidenbecher, Andrea Dernbecher, Shreyas Kulkarni, Suresh Gopalkrishna, Lucas Briest, Nicole Vorhauer-Huget, Liane Hilfert, Nora Kulak, Alba Dieguez-Alonso  
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#### LES OF A 47 KWTH SWIRLED-STABILIZED METHANE-ASSISTED IRON FLAME WITH TABULATED CHEMISTRY

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#### LIQUID FUEL EVAPORATION UNDER ENTRAINED FLOW GASIFICATION CONDITIONS – INSIGHTS FOR BURNER DEVELOPMENT

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#### LOCALLY-RESOLVED DEM/CFD SIMULATIONS OF A GENERIC SHAFT KILN FOR LIME PRODUCTION

Enric Illana Mahiques, Klidi Qyteti, Torben Bergold, Siegmar Wirtz, Viktor Scherer  
Ruhr University Bochum, Germany

#### MEASUREMENTS OF NOX EMISSIONS FROM BIOMASS COMBUSTION IN MEDIUM TO LARGE-SCALE POWER PLANTS

Gabriel J Roeder<sup>1</sup>, Johannes Haimerl<sup>1</sup>, Yusheng Chen<sup>2</sup>, Matthias Gaderer<sup>2</sup>, Sebastian Fendt<sup>1</sup>, Hartmut Spliethoff<sup>1</sup>

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#### NATURAL GAS-HYDROGEN FLAMES UNDER THE INFLUENCE OF CHANGING WALL CONDITIONS AND AIR STAGING: NUMERICAL AND EXPERIMENTAL INVESTIGATION IN A PILOT PLANT SCALED OPTICALLY ACCESSIBLE COMBUSTION CHAMBER

Sven Eckart, Lars Raschke, Moritz Junge, Hartmut Krause  
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#### NUMERICAL STUDY ON THE IMPACT OF SUBMODELS FOR PYROLYSIS AND CHAR CONVERSION IN TURBULENT SWIRLING PULVERISED SOLID FUEL FLAMES UNDER OXYFUEL CONDITIONS

Hossein Askarizadeh<sup>1</sup>, Hendrik Nicolai<sup>2</sup>, Stefan Pielsticker<sup>1</sup>, Burak Özer<sup>1</sup>, Reinhold Kneer<sup>1</sup>, Christian Hasse<sup>2</sup>, Anna Maßmeyer<sup>1</sup>

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#### NUMERICAL INVESTIGATION OF CREEP DEFORMATION IN RADIANT TUBES UNDER CYCLIC THERMAL LOADS USING TRANSIENT CFD AND FEM MODELS

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#### ONLINE CORROSION MONITORING IN A WASTE CO-FIRED FLUIDIZED BED POWER PLANT

Dennis Hülsbruch, Adrian Marx, Jochen Ströhle, Bernd Epple

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#### OPERATIONAL DETERMINATION OF THE FRACTION COMPOSITION DURING WASTE INCINERATION

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#### OPERATIONAL PARAMETERS OF A 120 KW PYROLYSIS TEST PLANT FOR BIOMASS AND MIXED WASTE

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#### OPTIMISATION AND DIGITALISATION STRATEGIES FOR THE "FURNACE OF THE FUTURE" - ESPECIALLY FOR PLANTS OPERATED WITH HETEROGENEOUS SOLID FUELS

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#### OPTIMIZATION OF THE PLASMA-ASSISTED GASIFICATION PROCESS IN A VERTICAL ENTRAINED-FLOW GASIFIER THROUGH THE CFD SIMULATIONS

Robert Lewtak, Jonas Brandstetter, Johannes Waßmuth, Kentaro Umeki, Andrius Tamosiunas, Sebastian Bastek, Sebastian Fendt, Harmut Spliethoff

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#### OXY-FUEL COMBUSTION IN AN ENTRAINED FLOW TEST RIG FOR REGENERATION OF SPENT CALCIUM LOOPING SORBENTS

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#### OXYGEN SEPARATION WITH MIEC MEMBRANES ON A LAB SCALE OXY-FUEL FURNACE

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OVERALL PLANT OPTIMIZATION BY AUTOMATIC CONTROLLING WITH ACOUSTIC GAS  
TEMPERATURE MEASUREMENT – IMPROVEMENT OF EFFICIENCY, EMISSIONS, AND  
PLANT AVAILABILITY

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PARTICLE-RESOLVED NUMERICAL SIMULATION OF PYROLYSIS PROCESS OF A NON-IDEAL  
PLASTIC PARTICLE

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RETROFITTING OF A MAGNESIUM MELTING FURNACE WITH HYDROGEN BURNERS BY  
MEANS OF ENERGETIC BALANCING AND PROCESS OPTIMIZATION

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PLASTIC PYROLYSIS: AN EXPERIMENTAL STUDY ON THE CIRCULARITY OF ORGANIC-RICH  
FRACTION FROM MECHANICAL RECYCLING OF REFRIGERATORS

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PYROLYSIS OF HYDROCHARS DERIVED FROM CO-HYDROTHERMAL CARBONIZATION OF  
BIOMASS AND PLASTICS

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REACTIVITY ASSESSMENT OF CARBON-ZERO FUELS: METHANE, HYDROGEN, AND  
AMMONIA

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REHABILITATION OF AN EXISTING NATURAL GAS BOILER TO CO-COMBUSTION OF  
HYDROGEN RICH GAS

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## SIMULATION MODEL OF A STRIP ANNEALING LINE TO IMPROVE PRODUCT QUALITY IN PRECISION STRIP PRODUCTION

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## SOEFC PROCESS FOR HIGH-PURITY OXYGEN GENERATION: A CONCEPT STUDY

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## SPECTRAL RESOLVED RADIATIVE HEAT FLUX MEASUREMENTS IN A COMBUSTION CHAMBER

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## SUSTAINABLE PROCESS HEAT: CONDITIONING OF BIOGENIC SYNTHESIS GASES FROM GASIFICATION FOR DIRECT USE IN CONVENTIONAL BURNER SYSTEMS

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## THERMOCHEMICAL RECYCLING OF PLASTICS: STATE OF THE ART AND THE PROCESS ENGINEERING CHALLENGES AHEAD

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## THE FLOX-2 PROJECT: A REVIEW OF THE BASIC STUDIES

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## THE INFLUENCE OF PARTICLE SIZE ON THE QUARTZ SAND CALCINATION IN ROTARY KILNS

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## TOWARDS GENERAL REACTOR NETWORK MODELING FOR METAL FUEL COMBUSTION

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TOWARDS USING LARGE EDDY SIMULATION FOR ANALYSIS OF COMBUSTION CHARACTERISTICS IN A 1 MW BIOMASS BURNER

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TRANSFERABILITY OF EMPIRICAL AND NETWORK PYROLYSIS MODELS TO TORREFACTION BOUNDARY CONDITIONS

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WEIGHTED SUM OF GREY GASES RADIATION MODEL FOR OXYGEN-ENRICHED COMBUSTION OF HYDROGEN-METHANE MIXTURES

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A NOVEL PARTIALLY AERATED SWIRL BURNER DESIGN FOR BIOMASS THERMOCHEMICAL APPLICATIONS

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ENERGY EFFICIENT ALUMINIUM MOLTEN METAL HOLDING FURNACE

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HYDROGEN FROM BIOMASS: EFFECT OF OXYGEN ENRICHMENT ON STEAM GASIFICATION

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STUDY OF FLAME AND HEAT TRANSFER CHARACTERISTICS OF A PREMIXED HYDROGEN-BLENDED METHANE DUAL FLAME IMPINGING ON A FLAT PLATE

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CHEMICAL RECYCLING OF PLASTIC WASTE COMPARED TO A CONVENTIONAL VALORISATION PATHWAY

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#### CHEMICAL CHARACTERIZATION OF CONDENSED PHASES FROM WASTE PLASTICS PYROLYSIS

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#### COMBUSTION IN A COKE OVEN BATTERY: NUMERICAL MODELLING AND TESTING WITH FOCUS ON NOX EMISSION

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#### COW BONE WASTE USES AS A CATALYST FOR PYROLYSIS OF LIGNOCELLULOSIC BIOMASSES

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#### GREEN HYDROGEN APPLICATION IN THE HARD-TO-ABATE INDUSTRY: A FEASIBILITY STUDY

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#### HEAT TRANSFER CHARACTERISTICS OF AMMONIA COMBUSTION IN INDUSTRIAL FURNACES

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#### INTEGRATION OF MOLTEN CARBONATE FUEL CELLS (MCFCS) IN THE GLASSMAKING PROCESS TO ALLOW DECARBONISATION AND SUPPORTING ELECTRIFICATION

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## KINETICS OF IRON REDUCTION UPON REDUCTION/OXIDATION CYCLES

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## MULTI-MATERIAL INJECTION SYSTEM TO FOSTER CIRCULARITY: VALORIZATION OF RECYCLED POLYMERS FROM WASTE PLASTICS IN ELECTRIC ARC FURNACE

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## RIPLAID CONCEPT FOR VALORIZATION OF WASTE PLASTICS INTO GASOLINE: FROM LABORATORY TO PRE-INDUSTRIAL SCALE

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## SIMULATION AND VALIDATION AGAINST FULL-SCALE TESTING OF A 35 MW INDUSTRIAL BURNER WORKING IN MILD COMBUSTION REGIME

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## THERMOCHEMICAL VALORIZATION OF LIGNOCELLULOSIC WASTES INTO SUSTAINABLE BIOMATERIALS AND BIOFUELS

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SPECTRAL ANALYSIS OF ALTERNATIVE LOW-CARBON FUEL COMBUSTION IN PLASMA-ASSISTED BURNER

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XDEM TECHNOLOGY SUPPORTING THE TRANSITION FROM BLAST TO DIRECT REDUCTION IRON (DRI) FURNACES

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ASSESSMENT OF SYNGAS QUALITY FROM PLASTIC GASIFICATION FOR METHANOL SYNTHESIS

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GAS TURBINE OPERATION WITH HYDROGEN BLENDS

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EXPERIMENTAL AND NUMERICAL INVESTIGATION OF A MILD COMBUSTOR FOR GAS TURBINE APPLICATIONS

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GRANULAR MIXING EFFECTS ON RECYCLING OF STEELMAKING BY-PRODUCTS USING MICROWAVE HEATING

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## **South Korea**

COMBUSTION CHARACTERISTICS ON PERIODIC FUEL-FLOW CONTROL IN AN INDUSTRIAL FURNACE

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EFFECT OF NH<sub>3</sub> ADDITION ON A NATURAL GAS FUELED INDUSTRIAL RADIANT TUBE BURNER

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NUMERICAL STUDY ON INFLUENCES OF NITROGEN CONTENTS IN FUEL AND OXIDIZER ON NITROGEN OXIDE EMISSIONS DURING OXY-FUEL COMBUSTION OF NATURAL GAS

Yonmo Sung, Wontak Choi, Seunggi Choi  
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NUMERICAL INVESTIGATION ON AIR INFILTRATION IMPACT ON NITROGEN OXIDE EMISSIONS DURING NG-O<sub>2</sub> COMBUSTION

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NUMERICAL SIMULATION OF INDUSTRIAL BURNERS FOR OXY-FUEL COMBUSTION

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THE PARADIGMATIC SHIFT TOWARDS ELECTRIFICATION IN CONTINUOUS STEEL-STRIP ANNEALING FURNACES

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**Spain**

BEHAVIOUR OF DIFFERENT OXYGEN CARRIERS IN THE CHEMICAL LOOPING COMBUSTION OF PLASTIC RESIDUES

Teresa Mendiara, Maria Teresa Izquierdo, Óscar Condori, Lidia García  
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ENERGY STORAGE USING DIRECT IRON OXIDE REDUCTION AND ENERGY UTILIZATION WITH HIGH TEMPERATURE METAL COMBUSTION

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FLEXIBLE GREEN HYDROGEN COMBUSTION

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**Sweden**

A COMPREHENSIVE APPROACH FOR SAMPLING AND ANALYZING PRODUCT MIXTURES FROM A SEMI-INDUSTRIAL SCALE FLUIDIZED BED STEAM CRACKER

Chahat Mandviwala, Renesteban Forero Franco, Ivan Gogolev, Teresa Berdugo Vilches, Martin Seemann, Henrik Thunman

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CHARACTERIZATION OF PACKED BED REACTORS USING X-RAY MICROTOMOGRAPHY: EFFECT OF PARTICLE IRREGULARITY AND PARTICLE SIZE DISTRIBUTION ON THE BED MORPHOLOGY

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DIRECT CRACKING IN THERMAL PLASMA - A MEAN FOR DECARBONIZATION OF STEAM CRACKING FURNACES

Ivan Gogolev, Chahat Mandviwala, Nidia Diaz Perez, Renesteban Forero Franco, Martin Seemann

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EXPLORING FLUIDIZED BED TECHNOLOGY FOR BIOCARBON PRODUCTION WITH ALKALI/PHOSPHORUS MITIGATION

Eduardo Arango Durango, Kentaro Umeki

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EX-SITU CATALYTIC PYROLYSIS OF ELECTRONIC PLASTIC WASTE USING COMBINED CAO, HZSM-5 AND FE/HZSM-5 CATALYSTS FOR IMPROVING HYDROCARBONS YIELD

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HEAT TRANSFER ENHANCEMENT OF A THERMAL PLASMA IN A ROTARY KILN FOR CEMENT PRODUCTION

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IS A TWO-STEP THERMOCHEMICAL CONVERSION AN ALTERNATIVE ROUTE TO MAXIMIZE WASTE TIRES CIRCULARITY?

Nidia Diaz Perez, Chahat Mandviwala, Ivan Gogolev, Isabel Cañete-Vela, Renesteban Forero-Franco, Henrik Thunman, Martin Seemann

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OPTIMIZING CONSUMPTION OF VIRGIN BED MATERIAL WITH FLUIDIZED BED DIAGNOSTIC TOOLS

Tomas Leffler

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OVERVIEW OF EFFECTIVITY AND PRODUCTIVITY IMPROVEMENTS IN REHEATING FURNACES OVER THE LAST 25 YEARS: RESEARCH DEVELOPMENT, STATE OF THE ART AND FUTURE RESEARCH NEEDS

Gustav Haggström, Joel Falk, Andreas Johnsson

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THERMOCHEMICAL RECYCLING OF MIXED PLASTIC WASTES THROUGH PYROLYSIS AND STEAM CRACKING – ASSESSMENT OF CENTRALIZED VS. DECENTRALIZED APPROACHES.

Ivan Gogolev<sup>1</sup>, Nidia Diaz Perez<sup>1</sup>, Chahat Mandviwala<sup>1</sup>, Renesteban Forero Franco<sup>1</sup>, Ann-Christine Johansson<sup>2</sup>, Andre Selander<sup>2</sup>, Martin Seemann<sup>1</sup>

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TOWARDS SUSTAINABLE TEXTILE WASTE MANAGEMENT: EXPLORING VALUABLE CHEMICALS PRODUCTION THROUGH STEAM CRACKING IN A DUAL FLUIDIZED BED

Renesteban Forero Franco, Isabel Cañete-Vela, Chahat Mandviwala, Teresa Berdugo-Vilches, Nidia Diaz Perez, Ivan Gogolev, Henrik Thunman, Martin Seemann

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## Switzerland

TECHNICAL AND MARKET CHALLENGES IN THE CHEMICAL RECYCLING OF PLASTIC WASTES

Jean-Bernard MICHEL

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THE ENERGY TRANSITION AND ITS EFFECTS ON PROCESS INSTRUMENTATION

Oliver Seifert

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## Tunisia

COMBINED EFFECTS OF SQUARE FITTED WAVY WINGS AND RADIATIVE NANOFUID ON COOLING ELECTRONIC DEVICES

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## Turkey

NUMERICAL ANALYSIS OF HEATING ZONE OF THE CONTINUOUS ANNEALING FURNACE: EFFECT OF HEIGHT AND THICKNESS OF THE GLASS BOTTLES ON THE TEMPERATURE DISTRIBUTION OF GLASS BOTTLES.

Gönenç Can Altun, Oğuzhan Aşık, Hazar Şişik, Altuğ Melik Başol

Ozyegin University, Turkiye

## NUMERICAL INVESTIGATION OF THERMAL RADIATION IN THE COMBUSTION ZONE OF A GLASS MELTING FURNACE

Berkay Halvaşı, Tolga Altınoluk, Altuğ M. Başol, M. Pınar Mengüç  
Özyeğin University, Türkiye

## OPTIMIZING HEAT TREATMENT FURNACE OPERATING CONDITIONS: AN INVERSE SOLUTION METHODOLOGY

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## **United Kingdom**

### A 2-ZONE MATHEMATICAL MODEL FOR THERMAL DESIGN AND NOX FORECASTING ON HIGH TEMPERATURE INDUSTRIAL FURNACES

Robert Tucker, Neil Fricker  
Global Combustion Systems, Livingstone, United Kingdom

### APPLICATION OF GLASS MELTER NOX REDUCTION TECHNIQUES TO STEEL REHEATING FURNACES FIRING NATURAL GAS, COKE OVEN GAS AND HYDROGEN.

Neil Fricker, Richard Pont, Iain Shoveller  
Global Combustion Systems, Livingstone, United Kingdom

### CFD BASED SOLUTIONS TO RESOLVE COMBUSTION AND EMISSIONS ISSUES OF WASTE-TO-ENERGY PLANTS

Anura Perera, Thomas Ball, John Goldring, Gerry Riley  
RJM International, United Kingdom

### CHEMICAL RECYCLING OF PLASTIC WASTE VIA PYROLYSIS USING WASTE-DERIVED CATALYSTS

Gerardo Martinez Narro, Anh N. Phan  
Newcastle University, United Kingdom

### COMPARISON OF THE NOX EMISSIONS FOR A 70KW DUAL FUEL HYDROGEN/NATURAL GAS INDUSTRIAL BURNER

Gordon Andrews<sup>1,2</sup>, Ramon Quinonez<sup>2</sup>, Ray Massey<sup>2</sup>, Richard Wakeman<sup>2</sup>, Jason Poon<sup>1</sup>, Herodotus Phylaktou<sup>1</sup>, Steve Smith<sup>2</sup>  
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### EXPERIMENTAL INVESTIGATIONS & ALGEBRAIC COMBUSTION MODEL PREDICTIONS FOR HYDROGEN-ENRICHED LEAN HYDROCARBON/AIR MIXTURES OF DIFFERENT LEWIS NUMBERS

Siva Muppala, Sooraj Mana Paleli Vasudevan  
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### HYDROGEN FOR INDUSTRIAL DECARBONISATION

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#### USE OF CRACKED AMMONIA FOR THE REPLACEMENT OF PROPANE IN INDUSTRIAL BOILERS

Agustin Valera-Medina<sup>1</sup>, Syed Mashruk<sup>1</sup>, Marsh Richard<sup>1</sup>, James Rudman<sup>2</sup>, Joanna Jojka<sup>3</sup>, Phil Bowen<sup>1</sup>

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#### QUANTIFICATION OF ORGANIC VOLATILE SPECIES FROM BIOMASS COMBUSTION

Amanda Lea-Langton, James Allan, Arthur Garforth

The University of Manchester, United Kingdom

#### QUANTIFYING THE EFFECT OF RESIDENCE TIME AND EQUIVALENCE RATIO ON RADIATIVE HEAT TRANSFER FROM HYDROGEN-METHANE BLENDED FLAMES BY USE OF A DIFFUSION SWIRL BURNER

Benjamin Rhys White<sup>1</sup>, Steven Morris<sup>1</sup>, Burak Goktepe<sup>1</sup>, Anthony Giles<sup>1</sup>, Richard Marsh<sup>1</sup>, Andrew Price<sup>2</sup>

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#### WHISKY DISTILLERY BIOMASS WASTE PRODUCTS AND THEIR POTENTIAL, USING AIR GASIFICATION, TO GENERATE A BIOMASS GASIFICATION GAS (BGG) TO DECARBONISE THE DISTILLERY HEAT.

Gordon Andrews<sup>1,2</sup>, Ramon Quinonez<sup>2</sup>, Francis Olanrewaju<sup>2</sup>, Mohammed Khan<sup>1</sup>, Ray Massey<sup>2</sup>, Richard Wakeman<sup>2</sup>, Hu Li<sup>1</sup>, Herodotus Phylaktou<sup>1</sup>, Steve Smith<sup>2</sup>

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### **United States**

#### A COMPARISON OF REHEATING METALS IN COMBUSTION PROCESSES USING NATURAL GAS AND HYDROGEN FUELS

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#### COMBUSTION AND CONVECTION RESEARCH

Ivanka Petkova Nikolova

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#### CUTTING NOX EMISSIONS WITH THE CALLIDUS® ULTRA BLUE® BURNER SYSTEM

Kurt Kraus

Honeywell UOP Callidus, United States of America