



# 11th EUROPEAN CONFERENCE ON INDUSTRIAL FURNACES AND BOILERS

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## ABSTRACTS ACCEPTED

Authors of accepted Abstracts have already been invited to proceed with the preparation of their draft papers. It should be noted, however, that this invitation does not imply guaranteed acceptance of the final paper since each draft paper will be subject to review by three Referees prior to incorporation in the Conference Programme.

**Draft papers should be submitted by 20 October 2016 on our website: [Call for Papers](#)**

**Authors will be notified of final acceptance/rejection by 20 December 2016. Final, completed papers will be required by 20 February 2017."**

### Algeria

#### **NUMERICAL MODELING OF HEAT TRANSFER INTO A COIL: APPLICATION TO ANNEALING OF STEEL COILS**

Maxence Bigerelle and Abdallah Haouam

University of Valenciennes and Hainaut Cambresis (France) and Badji Mokhtar University (Algeria)

### Argentina

#### **DESIGN OF A DRYING FURNACE FOR BIG MOTORS**

Dolores Demarco and Pablo Marino

Tenaris Siderca (Argentina)

### Austria

#### **MODELING OF A WALKING BEAM FURNACE USING CFD – METHODS**

Werner Pollhammer, Christoph Spijker and Harald Raupenstrauch

K1-MET GmbH and Montanuniversitaet Leoben (Austria)

#### **DEVELOPMENT OF AN ATMOSPHERE PARTICLE KINETIC MODEL FOR PARTICLE REACTIONS, IN A COMBUSTION FLASH-REACTOR USING CFD- METHODS**

Franz Edler, Christoph Spijker, Harald Raupenstrauch and Bernhard Geier

K1-met GmbH and Chair of Thermal Processing Technology, Montanuniversitaet Leoben (Austria)

#### **THE VIRTUAL BIOMASS GRATE FURNACE - AN OVERALL CFD MODEL FOR BIOMASS COMBUSTION PLANTS**

Ali Shiehnejadhesar, Ramin Mehrabian, Robert Scharler and Christoph Hochenauer

BIOENERGY 2020+ GmbH and Institute of Thermal Engineering, Graz University of Technology (Austria)

## **VALIDATION OF TURBULENCE/CHEMISTRY INTERACTION MODELS FOR USE IN OXYGEN ENHANCED COMBUSTION**

Rene Prieler, Petr Bělohradský, Bernhard Mayr, Andreas Rinner and Christoph Hochenauer  
Institute of Thermal Engineering, Graz University of Technology and Institute of Process and Environmental Engineering, Brno University of Technology (Austria)

## **STRATEGIES AND TECHNOLOGIES TOWARDS ZERO EMISSION BIOMASS COMBUSTION BY PRIMARY MEASURES**

Ingwald Obernberger, Thomas Brunner and Christoph Mandl  
BIOS BIOENERGIESYSTEME GmbH (Austria)

## **MATERIAL SELECTION FOR EFFICIENT HEAT RECOVERY UNITS - ONLINE MEASUREMENT OF CORROSION RATES AND ACID DEW POINTS IN BIOMASS COMBUSTION PLANTS**

Erwin Reisenhofer, Ingwald Obernberger, Thomas Brunner and Werner Kanzian  
BIOS BIOENERGIESYSTEME GmbH (Austria)

## **CFD MODELLING AND PERFORMANCE INCREASE OF A PUSHER TYPE REHEATING FURNACE USING OXY-FUEL BURNERS**

Bernhard Mayr, Rene Prieler, Martin Demuth, Luca Moderer and Christoph Hochenauer  
Graz University of Technology, Messer Austria GmbH and Marienhütte GmbH (Austria)

## **CO/CO<sub>2</sub> RATIO IN BIOMASS CHAR OXIDATION**

Andrés Anca-Couce, Peter Sommersacher, Robert Scharler and Christoph Hochenauer  
Institute of Thermal Engineering, Graz University of Technology and BIOENERGY 2020+ GmbH (Austria)

## **Belgium**

## **COLLABORATIVE SIMULATIONS AND EXPERIMENTS FOR DEVELOPMENT AND UNCERTAINTY QUANTIFICATION OF A REDUCED CHAR OXIDATION AND GASIFICATION MODEL IN OXY-COAL COMBUSTION CONDITIONS**

Salvatore Iavarone, Benjamin Isaac, Sean Smith, Philip Smith and Alessandro Parente  
Université Libre de Bruxelles (Belgium) and Institute for Clean and Secure Energy, University of Utah (USA)

## **IN-FURNACE MEASUREMENTS OF SPECIES AND TEMPERATURE DURING THE MILD COMBUSTION OF A COG/BFG BLEND ON A 30 KW CHAMBER**

Gabriele Mosca and Delphine Lupant  
UMONS (Belgium)

## **ANALYSIS OF A 20 KW FLAMELESS FURNACE FIRED BY METHANE**

Marco Ferrarotti, Delphine Lupant and Alessandro Parente  
ULB, UMONS, ULB and UMONS (Belgium)

## **EXPERIMENTAL AND NUMERICAL INVESTIGATION OF A MILD-BASED STIRLING ENGINE FED WITH LANDFILL GAS**

Valentina Fortunato, Abdallah Abou-Taouk and Alessandro Parente  
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## **ENERGY AND ENVIRONMENTAL PERFORMANCES OF A DOMESTIC HOT WATER CONDENSING BOILER FUELED BY WOOD PELLETS**

Philippe Ngendakumana, Fabian Gabriele, Yannick Restivo and Kévin Sartor  
University of Liège (Belgium)

## **ENERGY EFFICIENT STRIP ANNEALING THROUGH ROLL REGENERATIVE FURNACE**

Michel Renard and Jean-Marie Buchilin

Drever International S.A. and von Karman Institute for Fluid Dynamics (Belgium)

## **Brazil**

### **COMBUSTION AND HEAT BALANCE FOR OPTIMIZING ONE SHORT ROTARY FURNACE FOR LEAD SMELTING**

Gabriel Faé Gomes and Leandro Dalla Zen

Vale do Rio dos Sinos University (Brazil)

### **STUDY OF SOUTH BRAZILIAN COAL AND BIOMASS COFIRING USING A BENCH SCALE BUBBLING FLUIDIZED BED COMBUSTOR**

Flavio Bianchi

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### **CHARACTERIZATION OF A SWIRL-STABILIZED FLAME BURNER WITH COUPLED GLIDING ARC PLASMA REACTOR**

Armando José Pinto, Julio César Sagás and Pedro Teixeira Lacava

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### **ASSESSMENT OF RADIATIVE HEAT TRANSFER IN CORRUGATED CYLINDRICAL FURNACES**

Gleyzer Martins, Oscar Saul Hernandez Mendoza and Enio Pedone Bandarra Filho

Federal University of Uberlândia (Brazil)

### **PERFORMANCE QUANTIFICATION OF A CYCLONIC BOILER USING BIOMASS POWDER**

Alan Nogueira Carneiro, Diego Carneiro De Oliveira, Matheus Carneiro Rocha, Marcelo De Oliveira E Silva, Danielle Regina Da Silva Guerra and Manoel Fernandes Martins Nogueira

Federal University of Pará (Brazil)

### **CFD MODELING OF A SMALL-SCALE CYCLONIC COMBUSTOR CHAMBER USING BIOMASS POWDER**

Rodrigo Cavalcanti Ribeiro Lima, Danielle Regina Da Silva Guerra and Manoel Fernandes Martins Nogueira

Federal University of Pará (Brazil)

### **LAMINAR BURNING VELOCITY OF BIOGAS-AIR MIXTURES AND FLAME PROPAGATION SPEED CLOSE TO THE CHAMBER WALL**

Loreto Pizzuti and Cristiane Martins

ITA Instituto Tecnológico da Aeronáutica (Brazil)

## **Canada**

### **HIGH PRESSURE OXY-FIRED (HIPROX) DIRECT CONTACT STEAM GENERATION (DCSG) TECHNOLOGY DEVELOPMENT FOR STEAM ASSISTED GRAVITY DRAINAGE (SAGD) APPLICATION TO EXTRACTION OF CANADIAN OIL SAND**

Bruce Clements, Ted Herage, Paul Cairns, Mohammed Asiri, Steven Chen and Todd Pugsley

CanmetENERGY and Suncor Energy Inc. (Canada)

## China

### **NUMERICAL SIMULATION OF COMBUSTION PROCESS FOR A MICRO GAS TURBINE COMBUSTOR UNDER OFF-DESIGN CONDITION**

Chao Zong, Tong Zhu and Yaya Lyu  
Tongji University (China)

### **FIELD TEST AND ENERGY-SAVING POTENTIAL OF A BATCH-TYPE INDUSTRIAL FURNACE**

Zhou Yu and Chaokui Qin  
Tongji University (China)

## Czech Republic

### **ASSESSMENT OF THE EFFECT OF FUEL AND TYPE OF MEASURING FOR THE HG EMISSIONS FROM COMBUSTION OF COAL**

Karel Borovec, Tadeas Ochodek and Jerzy Gorecki  
VŠB Technical University of ostrava, Energy Research Center (Czech Republic) and AGH University of Science and Technology (Poland)

## Denmark

### **A GENERIC CFD-ORIENTED GAS RADIATION PROPERTY MODEL AND ITS DEMONSTRATION IN NATURAL GAS-FIRED FURNACE MODELLING**

Chungen Yin, Shashank Singh and Sergio Sanchez Romero  
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### **BIOMASS PARTICLE GASIFICATION: DEVELOPMENT AND VALIDATION OF A COMPREHENSIVE MATHEMATICAL MODEL**

Xiyan Li and Chungen Yin  
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## Finland

### **A CORE-ANNULUS-TYPE MATHEMATICAL MODEL AND NUMERICAL SIMULATION FOR THE CFB BOILER FURNACE**

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### **INTEGRATED TRANSIENT SIMULATION OF A BFB BOILER WITH CFD MODELS FOR THE BFB FURNACE AND DYNAMIC SYSTEM MODELS FOR THE STEAM CYCLE AND BOILER OPERATION**

Marko Huttunen, Ismo Karppinen, Timo Pättikangas, Hannu Niemistö, Lassi Karvonen and Sirpa Kallio  
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### **ANALYSIS OF THE PROCESSES IN FLUIDIZED BED BOILER FURNACES DURING LOAD CHANGES**

Marko Huttunen, Juho Peltola, Timo Niemi, Lassi Karvonen and Sirpa Kallio  
VTT Technical Research Centre of Finland (Finland)

## **CRITICAL REVIEW ON MATHEMATICAL MODELS OF MOVING GRATE IRON ORE PELLET INDURATION FURNACE**

Mariana M. O. Carvalho, Manuel García Pérez, Debora G. Faria, Marcelo Cardoso and Esa Vakkilainen  
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## **IMPROVEMENT OF LOAD-FOLLOWING CAPACITY OF GRATE BOILERS BASED ON THE COMBUSTION POWER SOFT-SENSOR**

Jukka Kortela  
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## **France**

### **NUMERICAL CFD SIMULATIONS FOR OPTIMIZING A BIOMASS GASIFIER AND METHANATOR REACTOR DESIGN AND OPERATING CONDITIONS**

Victoria Bogdanova and Erwin George  
ENGIE Lab CRIGEN (France)

### **RADIANT TUBES LIFETIME PREDICTION IN STEEL PROCESSING LINES USING FLUID-STRUCTURE INTERACTION MODELLING**

Sébastien Caillat and Catherine Pasquinet  
Fives Stein (France)

### **PREHEATED OXYFUEL COMBUSTION ADAPTED TO LOW CALORIFIC BLAST FURNACE GAS**

Abou Bâ, Armelle Cessou, Niomar Marcano, Faustine Panier, Rémi Tsiava, Guillaume Cassarino, Ludovic Ferrand and David Honore  
CORIA - CNRS, Normandie Université, Université de Rouen, Air Liquide and CMI GreenLine Europe (France)

### **ON THE EFFECT OF SEPARATED OXYGEN AND CARBON DIOXIDE INJECTIONS ON THE STABILISATION OF DILUTED OXYFUEL FLAMES**

Sarah Juma, David Honore, Bertrand Lecordier, Xavier Paubel and Armelle Cessou  
CORIA - CNRS, Normandie Université, Université de Rouen and Air Liquide (France)

### **MODELLING OF FLAMELESS OXY-FUEL COMBUSTION WITH EMPHASIS ON RADIATIVE HEAT TRANSFER FOR LOW CALORIFIC VALUE BLAST FURNACE GAS**

Phuc Danh Nguyen, Ghassan Ghazal, Víctor Cuervo Piñera, Valerio Battaglia, Anders Rensgard, Tomas Ekman and Moncef Gazdallah  
ArcelorMittal (France and Spain), Centro Sviluppo Materiali (Italy), Swerea MEFOS (Sweden), AGA Linde (Sweden) and University of Mons (Belgium)

## **Germany**

### **DEVELOPMENT OF AN ENERGY-EFFICIENT BURNER FOR HEAT TREATMENT FURNACES WITH A REDUCING GAS ATMOSPHERE**

Nico Schmitz, Christian Schwotzer, Herbert Pfeifer and Joachim G. Wüning  
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### **COMBUSTOR CONCEPT FOR INDUSTRIAL GAS TURBINES WITH SINGLE DIGIT NOX AND CO EMISSION VALUES**

Ahmad Al-Halbouni  
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### **OXY-FUEL BURNER INVESTIGATIONS FOR CO<sub>2</sub> CAPTURE IN CEMENT PLANTS**

Francisco Carrasco Maldonado, Jørn Bakken, Mario Ditaranto, Nils Haugen, Øyvind Langørgen, Simon Grathwohl, Jörg Maier and Günter Scheffknecht  
IFK - University of Stuttgart (Germany) and SINTEF-ER (Norway)

### **EXPERIMENTAL INVESTIGATION OF PYROLYSIS GASES RELEASED FROM AL-SCRAP AND THEIR IMPLEMENTATION INTO A NUMERICAL FURNACE MODEL**

Henning Bruns, Rukiye Gültekin, Antje Rückert and Herbert Pfeifer  
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### **USE OF LOW-QUALITY BIOGENIC FUELS IN A DECENTRALIZED BIOMASS BOILER FOR THERMAL ENERGY GENERATION**

Franziska Reinardt, Helmut Seifert and Hans-Joachim Gehrman  
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### **NUMERICAL STUDY ON THE INFLUENCE OF OPERATIONAL SETTINGS ON REFUSE DERIVED FUEL CO-FIRING IN CEMENT ROTARY KILNS**

Birk Liedmann, Siegmar Wirtz, Viktor Scherer and Burkhard Krüger  
Department of Energy Plant Technology (LEAT), Ruhr-University, Bochum and Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT (Germany)

### **A TECHNOLOGY COMPARISON CONCERNING SCALE DEPENDENCIES OF INDUSTRIAL FURNACES. A CASE STUDY OF GLASS PRODUCTION**

Corina Dorn, Ralph Behrend, Volker Uhlig, Dimosthenis Trimis and Hartmut Krause  
TU Bergakademie Freiberg and Karlsruher Institut für Technologie (Germany)

### **CERAMIC HEAT PIPES FOR HIGH TEMPERATURE APPLICATION**

Nina Hack, Simon Unz and Michael Beckmann  
Technische Universität Dresden (Germany)

### **INVESTIGATIONS ON CONTAINER MATERIALS IN HIGH TEMPERATURE MICROWAVE APPLICATIONS**

Ralph Behrend, Corina Dorn, Volker Uhlig and Hartmut Krause  
TU Bergakademie Freiberg (Germany)

### **STUDY ON THE INFLUENCE OF ETHANOL AND BUTANOL ADDITION ON SOOT FORMATION IN ISO-OCTANE FLAMES**

Isabel Frenzel, Dimosthenis Trimis and Hartmut Krause  
TU Bergakademie Freiberg, Institute of Thermal Engineering and Karlsruhe Institute of Technology, Engler-Bunte-Institute, Division of Combustion Technology (Germany)

### **LAMINAR BURNING VELOCITIES OF LOW CALORIFIC AND HYDROGEN CONTAINING FUEL BLENDS**

Sven Eckart, Christina Penke, Stefan Voss and Hartmut Krause  
TU Bergakademie Freiberg (Germany)

### **A METHOD TO DETERMINE THE ASH MELTING BEHAVIOUR OF PULVERISED FUELS UNDER REAL PROCESS CONDITIONS**

Christopher Thiel, Sebastian Grahl and Michael Beckmann  
TU Dresden (Germany)

### **MODELING AND VALIDATION OF THE SIDERITE CALCINATION IN A ROTARY KILN**

Fabian Herz and Eckehard Specht  
Otto von Guericke University Magdeburg (Germany)

**INFLUENCE OF PARTICLE SIZE DISTRIBUTION ON THE LIMESTONE DECOMPOSITION IN NORMAL SHAFT KILNS**

Hallak Bassem, Fabian Herz, Eckehard Specht, Robin Gröpler and Gerald Warnecke  
Otto von Guericke University Magdeburg (Germany)

**COMBUSTION BEHAVIOR OF COKE IN SHAFT KILNS WITH HYPERSTOICHIOMETRIC AIR FLOW**

Bassem Hallak, Nyein Nyein Linn, Eckehard Specht and Fabian Herz  
Otto von Guericke University Magdeburg (Germany)

**INFLUENCE OF CIRCULATION SYSTEMS ON THE FIRING OF COARSE CERAMICS IN INDUSTRIAL TUNNEL KILNS**

Tino Redemann and Eckehard Specht  
Otto von Guericke University Magdeburg (Germany)

**THE DEVELOPMENT OF OPTO-ACOUSTIC DIAGNOSTIC SYSTEMS FOR INDUSTRIAL THERMAL PROCESSING PLANTS - HIGH PRECISION THERMAL IMAGING, HIGH-DEFINITION CONDITION EVALUATION AND OSCILLATION DETECTION AND ANALYSIS**

Philipp Pietsch, Matthias Werschky and Hartmut Krause  
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**PROCESS MODEL OF A ROTARY KILN FOR PRODUCTION OF INORGANIC PIGMENTS**

Matthias Kalkert and Michael Modigell  
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**RELEASE OF SULFUR AND CHLORINE GAS SPECIES DURING AIR AND OXY-FUEL COAL PYROLYSIS AND COMBUSTION IN AN ENTRAINED FLOW REACTOR**

Lorenz Frigge, Jochen Ströhle and Bernd Epple  
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**PRODUCTION OF HYDROGEN BY AUTOTHERMAL REFORMING OF BIOGAS**

Andreas Herrmann, Florian Rau, Hartmut Krause, Stephan Anger, Yeidy Sorani Montenegro Camacho, Debora Fino and Dimosthenis Trimis  
TU Bergakademie Freiberg, (Germany), DBI GTI (Germany), Politecnico di Torino (Italy) and Karlsruhe Institute of Technology (KIT) (Germany)

**COMBUSTION AND GASIFICATION OF SOLID FUEL IN A HYBRID POROUS REACTOR**

Vojislav Jovicic, Nataliia Fedorova, Ana Zbogar-Rasic, Daniel M. Nloka and Antonio Delgado  
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**IMPACT OF SOLID BODY EMISSIVITY ON RADIATIVE HEAT TRANSFER EFFICIENCY IN FURNACES – A NUMERICAL STUDY**

Melanie Grote, David Diarra and Elmar Pohl  
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**COMBUSTION AND FLOW MIXING IN THE GAP BETWEEN THE CARS IN TUNNEL KILNS**

Adnan Al-Hasnawi, Abdul Qayyum and Eckehard Specht  
Otto von Guericke University Magdeburg (Germany)

**PREDICTION OF CORROSIVE ATMOSPHERES IN A FURNACE OF AN INDUSTRIAL POWER PLANT**

Maximilian Von Bohnstein, Alexander Stroh, Jochen Ströhle and Bernd Epple  
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**BURNER DESIGN FOR AN INDUSTRIAL FURNACE OPERATING AT CONDITIONS OF THERMAL POST-COMBUSTION**

Jordan Denev, Ilian Dinkov and Henning Bockhorn  
Karlsruhe Institute of Technology (Germany)

**ALUMINIUM RECYCLING FURNACE MODEL FOR IMPROVED MELTING PROCESS OF CONTAMINATED SCRAP**

Rukiye Gültekin, Antje Rückert and Herbert Pfeifer  
Department of Industrial Furnaces and Heat Engineering (Germany)

**NOVEL CORROSION PROTECTION COATINGS WITH ANTISTICK PROPERTIES FOR HEAT EXCHANGER SURFACES**

Frank Meyer and Volker Hofmann  
CeraNovis GmbH (Germany)

**BEHAVIOUR OF ENGINEERED NANOPARTICLES IN A LAB-SCALE FLAME AND COMBUSTION CHAMBER**

Werner Baumann, Nadine Teuscher, Manuela Hauser, Hans-Joachim Gehrman, Dieter Stapf and Hanns-Rudolf Paur  
Karlsruhe Institute of Technology (Germany)

**BIOGAS AS A CO-FIRING FUEL IN THERMAL PROCESSING INDUSTRIES: IMPLEMENTATION IN A GLASS MELTING FURNACE**

Jörg Leicher, Marcel Fiehl, Anne Giese, Klaus Görner and Bernhard Fleischmann  
Gas- und Wärme-Institut Essen e.V. and Hüttentechnische Vereinigung der Deutschen Glasindustrie e.V. (Germany)

**NATURAL GAS QUALITY FLUCTUATIONS—SURVEYS AND STATISTICS ON THE SITUATION IN GERMANY**

Jörg Leicher, Anne Giese, Klaus Görner, Matthias Wersch and Hartmut Krause  
Gas- und Wärme-Institut Essen e.V. and DBI Gas- und Umwelttechnik GmbH (Germany)

**POWER-TO-GAS AND THE CONSEQUENCES: IMPACT OF HIGHER HYDROGEN CONCENTRATIONS IN NATURAL GAS ON INDUSTRIAL COMBUSTION PROCESSES**

Tim Nowakowski, Jörg Leicher, Anne Giese and Klaus Görner  
Gas- und Wärme-Institut Essen e.V. (Germany)

**LOCAL STEAM TEMPERATURE IMBALANCES OF COAL-FIRED BOILERS AT VERY LOW LOAD**

Jens Hinrich Prause, Moritz Hübel, Dorian Holtz, Jürgen Nocke and Egon Hassel  
FVTR GmbH and University of Rostock (Germany)

**MODELLING OF BIOMASS COMBUSTION AND DEPOSITION FORMATION IN GRATE FURNACE POWER PLANTS**

Dorian Holtz, Moritz Hübel, Jürgen Nocke and Egon Hassel  
University of Rostock (Germany)

**FLAMELESS OXIDATION OF LIQUID FUEL OIL IN A REVERSE-FLOW COOLED COMBUSTION CHAMBER**

Henning Luhmann, Reinhold Spörl and Günter Scheffknecht  
University of Stuttgart (Germany)

**PULVERIZED COAL IGNITION TESTING UNDER AIR-FIRED CONDITIONS USING THE ZELKOWSKI METHOD: COMPARISON OF COALS OF DIFFERENT RANK AND PROVENIENCE**

A. Becker, M. Schiemann, V. Scherer, D. Haxter and J. Mayer  
Ruhr-University and Uniper Technologies GmbH (Germany)



### **THE FATE OF CHLORINE DURING CO-FIRING OF PULVERISED COAL-STRAW BLENDS**

Christian Wolf, Andreas Stephan, Sebastian Fendt and Hartmut Spliethoff  
Technical University of Munich (Germany)

### **ONLINE CORROSION MEASUREMENTS IN SMALL-, MID- AND POWER PLANT SCALE DURING PULVERISED BIOMASS/COAL CO-COMBUSTION**

Andreas Stephan, Christian Wolf, Sebastian Fendt and Hartmut Spliethoff  
Technical University of Munich (Germany)

### **KEY PARAMETERS FOR SPECTRAL EMITTANCE OF ASHES OF SOLID FUELS**

J. Gorewoda and V. Scherer  
Ruhr-Universität Bochum (Germany)

## **India**

### **UNIFIED IGNITION – DEVOLATILIZATION MODEL FOR FIXED BED BIOMASS GASIFICATION /COMBUSTION**

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## **Iran**

### **NUMERICAL SIMULATION OF A NON-PREMIXED TUBULAR FLAME**

Mahdi Bordbar and Hadi Pasdarsahri  
(Iran)

### **NUMERICAL STUDY OF THE COMBUSTION CHARACTERISTICS AND EMISSION OF A DUAL-FUEL BURNER IN A POWER PLANT BOILER**

Ehsan Mohammadian, Kiumars Mazaheri and Hadi Pasdarsahri  
Faculty of Mechanical Engineering, Tarbiat Modares University (Iran)

### **OPTIMIZATION OF TEMPERATURE DISTRIBUTION IN A CRACKING FURNACE USING CFD**

Saber Pilva, Kiumars Mazaheri and Hadi Pasdarsahri  
Faculty of Mechanical Engineering, Tarbiat Modares University (Iran)

## **Italy**

### **AN EXPERIMENTAL AND NUMERICAL STUDY OF MILD COMBUSTION IN A CYCLONIC BURNER**

Giancarlo Sorrentino, Ugur Göktolga, Mara De Joannon, Jeroen Van Oijen, Antonio Cavaliere and Philip De Goey  
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**INNOVATIVE TECHNOLOGICAL SOLUTIONS MOVING TOWARDS THE REALIZATION OF A STAND-ALONE BIOMASS BOILER WITH NEAR-ZERO PARTICULATE EMISSIONS**

Cesare Saccani, Augusto Bianchini and Marco Pellegrini  
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**APPLICATION OF THE CARBON LOOPING (CARBOLOOP) CONCEPT IN A NOVEL TWIN-BED REACTOR**

Antonio Coppola, Osvalda Senneca and Piero Salatino  
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**AN OPTIMAL ALGORITHM TO ASSESS THE COMPLIANCE WITH THE T2S REQUIREMENT OF WASTE-TO-ENERGY FACILITIES**

Federico Viganò and Francesco Magli  
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## Japan

**ULTRA-LOW NOX OXYGEN-ENRICHED COMBUSTION SYSTEM USING OSCILLATION COMBUSTION METHOD**

Yoshiyuki Hagihara, Kimio Iino, Yasuyuki Yamamoto and Tomoyuki Haniji  
TAIYO NIPPON SANZO Co., Gas Application Technology Center and TAIYO NIPPON SANZO Co. (Japan)

**THE RADIATIVE CHARACTERISTICS OF NH<sub>3</sub>/N<sub>2</sub>/O<sub>2</sub> NON-PREMIXED FLAME IN 10 KW TEST FURNACE**

Ryuichi Murai, Ryohei Omori, Ryuki Kano, Yuji Tada, Hidetaka Higashino, Noriaki Nakatsuka, Jun Hayashi, Fumiteru Akamatsu, Kimio Iino and Yasuyuki Yamamoto  
Osaka Univ. Dept. of Mechanical Engineering and Taiyo Nippon Sanso Co.,Ltd. (Japan)

## Luxembourg

**COMBUSTION AND GASIFICATION ANALYSIS OF BIOMASS FUEL IN A FLUIDIZED BED: A FOUR-WAY COUPLING OF DEM-CFD**

Mohammad Mohseni and Bernhard Peters  
Faculty of Science, Technology and Communication (Luxembourg)

## Mexico

**SUPERHEATER IMPACT BY COMBUSTIBLE CHANGE IN A POWER PLANT**

G. Lizbeth Porras, Vladimir A. Reyes and Alejandro G. Mani  
Instituto de Investigaciones Eléctricas (Mexico)

## Netherlands

### **ADVANCE GASIFICATION FOR REPLACEMENT OF FOSSIL FUELS IN EXISTING BOILERS AND FURNANCE**

Martin Van 'T Hoff and Robin Zwart  
Dahlman Renewable Technology B.V. (Netherlands)

### **FURNACE COMBUSTION AND CONTROL RENOVATION TO IMPROVE THE PRODUCTIVITY OF A CONTINUOUS ANNEALING LINE**

Hai Wu and Bertie Van Benschop  
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### **EXPERIMENTAL AND NUMERICAL STUDY OF MILD COMBUSTION IN A LAB-SCALE FURNACE**

X. Huang, M.J. Tummers and D.J.E.M. Roekaerts  
Delft University of Technology (Netherlands)

## Norway

### **NUMERICAL ANALYSIS OF A NOVEL PARTIAL PREMIXED BLUFF BODY LOW NOX BURNER**

Christoph Meraner, Mario Ditaranto and Terese Løvås  
NTNU EPT and SINTEF Energy Research (Norway)

### **A KINETIC STUDY ON SIMULTANEOUSLY BOOSTING THE MASS AND FIXED-CARBON YIELD OF CHARCOAL PRODUCTION VIA ATMOSPHERIC CARBONIZATION**

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### **TECHNO-ECONOMIC ASSESSMENT OF INTEGRATED HYDROCHAR AND HIGH-GRADE ACTIVATED CARBON PRODUCTION FOR ELECTRICITY GENERATION AND STORAGE**

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## Poland

### **EXPERIMENTAL STUDY OF COMBUSTION PROCESS OF GASEOUS FUELS CONTAINING NITROGEN COMPOUNDS IN NEW, LOW-EMISSION ZONAL VOLUMETRIC COMBUSTION TECHNOLOGY**

Slefarski Rafal, Szewczyk Dariusz, Jankowski Radoslaw and Golebiewski Michal  
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Wieslaw Rybak, Anna Kisiela, Wojciech Moroń, Krzysztof Czajka, Karol Król, Arkadiusz Szydełko and Wieslaw Ferens  
Wroclaw University of Technology (Poland)

## Portugal

### **AIR LEAKS**

Jorge Pereira  
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### **REFUSE DERIVED FUEL FROM MUNICIPAL SOLID WASTE REJECTED FRACTIONS – A CASE STUDY**

Isabel Brás, M. E. Silva, G. Lobo, A. Cordeiro, M. Faria and L. T. De Lemos  
ESTGV/ IPV, CI&DETS/ IPV and Ferroviais Serviços SA (Portugal)

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João Silva, José Teixeira, Senhorinha Teixeira and Simone Preziati  
Universidade do Minho and EDP (Portugal)

### **NUMERICAL STUDIES OF PREMIXED AND DIFFUSION MESO/MICRO-SCALE FLAMES**

A. Cova, P.R. Resende, A. Cuoci, M. Ayoobi, A.M. Afonso and C.T Pinho  
Universidade do Porto (Portugal), Universidade Estadual Paulista (Brazil), Politecnico di Milano (Italy) and Wayne State Univ. (USA)

## Russia

### **LIQUID HYDROCARBONS COMBUSTION WITH SUPPLYING OF SUPERHEATED STEAM JET**

Igor Anufriev, Oleg Sharypov, Evgeniy Kopyev and Sergey Alekseenko  
Institute of Thermophysics, Siberian Branch, Russian Academy of Sciences (Russia)

## Saudi Arabia

### **FLAME AND FLOW FIELD INTERACTION OF HYDROGEN-ENRICHED METHANE NON-PREMIXED FLAMES WITH AND WITHOUT QUARL**

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## Slovenia

### **ADVANCED HEAT TRANSFER MODELING OF 600 MWE UTILITY BOILER**

Warga Zeljko, Butala Vincenc, Gobbi Massimo and Massimo Gobbi  
ICS tehnika (startup) (Slovenia), University of Ljubljana, Dept. for Mech. Eng. (Slovenia) and UNIDO (Italy)

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Víctor Cuervo Piñera, Diego Cifrián Riesgo, Phuc Danh Nguyen, Valerio Battaglia, Massimiliano Fantuzzi, Alessandro Della Rocca, Marco Ageno, Anders Rensgard, Chuan Wang, John Niska, Tomas Ekman, Carsten Rein and Wolfgang Adler  
ArcelorMittal (Spain), Centro Sviluppo Materiali (Italy), Tenova (Italy), Swerea MEFOS (Sweden), AGA Linde (Sweden) and VDEh-Betriebsforschungsinstitut (Germany)

**MODELLING OF FLUIDIZED BED COMBUSTION OF AGRICULTURAL AND FORESTRY WASTES USING ASPEN PLUS: FIRST COMPARISON WITH EXPERIMENTAL DATA**

I. Gómez, I. Ibarra, G. Aragón, J. González, D. Sanz, E. Rojas, J. J. Rodríguez-Maroto, C. Gutiérrez-Canas, R. Ramos, E. Borjabad, R. Escalada, I. Celades and V. Sanfelix  
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**Sweden**

**ON-LINE ALKALI MEASUREMENT DURING OXY-FUEL COMBUSTION**

Tomas Leffler, Magnus Berg, Christian Brackmann, Zhongshan Li and Marcus Aldén  
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**FLAME STRUCTURE AND SOOT FORMATION IN A PULVERIZED BIOMASS BURNER: EFFECT OF PROCESS PARAMETERS AND ACOUSTIC EXCITATION**

Angel David Garcia Llamas, Florian M. Schmidt and Kentaro Umeki  
Luleå University of Technology and Umeå University (Sweden)

**THE USE OF SOLID AND LIQUID WASTE FRACTIONS FOR CO-COMBUSTION TOGETHER WITH PROPANE**

Thomas Ekvall and Klas Andersson  
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**Switzerland**

**COMBUSTION OF TORREFIED BIOMASS CHIPS AND PELLETS PRODUCED LOCALLY IN SMALL AND MEDIUM SCALE BOILERS. COMPARISON WITH NON-TORREFIED FUEL OPERATION**

Michel Jean-Bernardl, Mark McCormick, Claire Tansley, Boris Correa, Justyna Eaves, Martin Schmid and Mario Vogeli  
University of Applied Sciences Western Switzerland, Granit Technology SA and Ökozentrum (Switzerland)

**NEW DEVELOPMENTS IN FLOW SENSORS FOR INDUSTRIAL FURNACES**

Oliver Seifert  
Endress+Hauser Flowtec AG (Switzerland)

**Ukraine**

**PREVENTING AUTOIGNITION INSIDE THE BURNER WITH HIGH TEMPERATURE OXIDANT PREHEATING**

Boris Soroka, Volodymyr Zgurskyi, Aleksandr Kozlov and Mark Khinkis  
Gas Institute of National Academy of Sciences of Ukraine (Ukraine) and Gas Technology Institute (USA)

## **United Kingdom**

### **ROTATING CYLINDERS FOR DEVELOPMENT OF CONVECTION IN HIGH TEMPERATURE COIL ANNEALING (HTCA) FURNACES**

Oula Fatla, Agustin Valera-Medina, Fiona Robinson, Mark Cichuta and Nathan  
Cardiff University, COGENT Power and TATA Steels (United Kingdom)

### **EXPERIMENTAL AND NUMERICAL INVESTIGATION OF AN ULTRA-LOW NOX METHANE BURNER**

Ingrid El Helou, Jenna Foale, Andrea Giusti, Jenni Sidey and Epaminondas Mastorakos  
Hopkinson Laboratory, Department of Engineering, University of Cambridge (United Kingdom)

### **CONDITIONAL MOMENT CLOSURE MODELLING FOR TURBULENT PULVERIZED COAL COMBUSTION**

Huangwei Zhang and Epaminondas Mastorakos  
University of Cambridge (United Kingdom)

### **NOX REDUCTION USING ADVANCED TECHNIQUES IN A 175MWTH MULTI-FUEL CORNER-FIRED BOILER**

Michael Kryjak, James Dennis and Graeme Ridler  
RJM Corporation (EC) Ltd (United Kingdom)

### **A STUDY INTO THE EFFECT OF AGGLOMERATE FORMATION DURING BIOMASS COMBUSTION IN A PILOT SCALE BUBBLING FLUIDISED BED UNIT AND ASSOCIATED DESIGN MODIFICATION**

Stephen Chilton and William Nimmo  
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## **USA**

### **CFD MODELLING EVALUATION OF SPRAY NOZZLES**

Allan Walsh  
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