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Bielsko-Biala, Poland

4th International Exhaust Emissions Symposium 22-23 May 2014

FINAL PROGRAMME

**Trends in automotive emissions, fuels,
lubricants, legislation and test methods
- present and future**

**organised as part of an on-going project
to establish BOSMAL as a
Centre of Competence for automotive
propulsion system development**

4th International Exhaust Emissions Symposium 22-23 May 2014

Notwithstanding decades of improvement in the industry, concern over the impact of vehicles on air quality remains high. Emissions of greenhouse gases from road vehicles remain very high on the political agenda; emissions of particulate matter are coming under increasing scrutiny as a form of pollution with wide-ranging negative impacts; certain as-yet unregulated gaseous emissions are potential air quality risks. Looking to the longer term, the security of the oil supply and broader energy usage concerns have become very much part of the automotive development landscape. Concern over gaseous and solid emissions – perhaps most infamously CO₂ – has become a concern for all major global markets, not just the US and EU.

The response to this has been the introduction of various pieces of legislation, some imposing increasingly strict emissions limits; others various mandates, incentives and quotas regarding fuel consumption and the types of fuels used. Now, following revelations that emissions from real vehicle usage are generally poorly reproduced in the laboratory, test methods themselves are changing: first in the laboratory (e.g. the WLTP/C; USA 1065/1066 procedures); furthermore, real driving emissions have increased in importance to the point where PEMS measurements will soon be a legal requirement. Randomised laboratory test cycles also remain a possibility. The introduction of PN limits and increased scrutiny of particulate emissions from engine types other than Diesel represents a somewhat new and challenging direction in emissions testing and control. These factors exert massive pressure on vehicle and engine manufacturers (both light duty and heavy duty), their suppliers and the oil and fuel industries. Other, allied fields such as R&D and fuel additive and lubricant suppliers also find themselves subject to the same forces. Many of the aforementioned problems are shared by the various stands of the industry – passenger car and light commercial vehicle/heavy duty/off road/marine – and many of the proposed strategies and technical solutions have multi-segment applicability.

However, the market is dictated not only by political and technical factors, but also by consumer demands, which are themselves also evolving. Something both legislators and the general public have in common is the goal of reducing fuel consumption, without any sacrifices in terms of durability or safety.

Responding to this pressure, a broad range of advanced engine technologies, catalytic aftertreatment systems, revised fuel types, bespoke lubricants and friction inhibitors, etc have been introduced. These strategies are often interrelated: low sulphur fuel is required for aftertreatment system compatibility; advanced engine design has impacts on required lubricant properties, etc. Fundamental changes to the propulsion strategy for on-road vehicles (e.g. fuel types/the implementation of advanced electromechanical systems - hybrids) represent a revolution in the industry. All these advanced technologies must be developed, tested, approved and certified. In the case of hybrid powertrains, accurately quantifying the real world CO₂ emissions benefit is of particular importance.

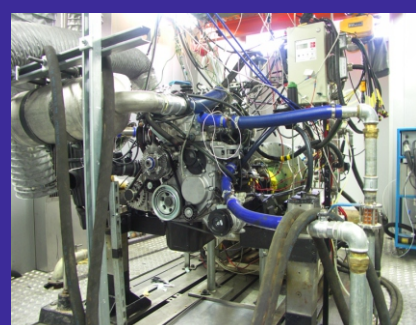
Mindful of the above, and with a proven track record of organising scientific meetings, BOSMAL & PTNSS are pleased to announce its 4th International Exhaust Emissions symposium, to be held on 22-23 May 2014 in Bielsko-Biala (Poland). The event shall build upon the successes of the past, but will include the very latest developments in the aforementioned fields and their implications for the various branches of the industry. Through the formation of business and personal relationships – and the potential for information sharing and collaboration that results – the various branches of the industry can advance together towards their goals. It is for this reason that we are organising another event of this type. This invitation, cordially extended to you, represents our desire for you to participate in what promises to be another very successful scientific meeting hosted at BOSMAL.

*Piotr Bielaczyc, Ph.D.,
Chairman of the Organizing Committee*

*Antoni Swiatek, D.Eng., D.Sc.,
President & CEO*

BOSMAL Automotive Research & Development Institute Ltd
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Poland

Polish Scientific Society of Combustion Engines
ul. Sarni Stok 93, 43-300 Bielsko-Biala
Poland



Main topics of the Symposium

- Emissions legislation - for all automotive sectors
- Fuel economy
- New methods of PM testing
- Compounds which are potential candidates for emissions regulation
- Emissions test equipment (including PEMS)
- Emissions reduction technology
- Aftertreatment system and catalyst technologies for the various automotive sectors
- Emissions simulation
- Powertrain development and electrification
- IC Engine test method development - all engine types/sizes
- Vehicular fuel development
- Alternative fuels, fuel additives and fuel blends
- Gaseous fuels: CNG & LPG
- Engine oil development
- Commercial vehicles, heavy duty and off road engines and vehicles (e.g. tractors)
- Synergies and shared challenges/solutions for the various automotive sectors

Venue:

BOSMAL Automotive Research & Development Institute
ul. Sarni Stok 93
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Poland

Accommodation - contact:

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Symposium language:
English

International Organising Committee:

- Dr. Piotr Bielaczyc - Chairman - BOSMAL, Poland
- Wolfgang Thiel- Vice Chairman - TRT, Germany
- Arkadiusz Wacławek- Coordinator - BOSMAL, Poland
- Chris Whelan - WDL, UK
- Dr. Gerardo Carelli - Carelli Consulting, Germany
- Prof. Jan Czerwinski - AFHB, Switzerland
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- Joseph Woodburn - BOSMAL, Poland
- Dr. Andrzej Suchecki - BOSMAL, Poland
- Klaudiusz Waniolka - BOSMAL, Poland
- Marta Kosakowska-Boda - BOSMAL, Poland

Symposium Dinner:

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Symposium Proceedings will be published on CD-ROM in the journal Combustion Engines

4th International Exhaust Emissions Symposium 22-23 May 2014

Introduction, Context & Agenda

Thursday, 22nd May 2014

- ♦ 09:00 - 09:10 - Welcome address - Drs Antoni Swiatek and Piotr Bielaczyc (BOSMAL, Poland)
- ♦ 09:10 - 09:50 - **Keynote: Dr. Peter Mock (The International Council on Clean Transportation, Germany)**
co-author: Vicente Franco (ICCT) – **Developments in Automotive Emissions, in the EU and Globally**
- ♦ 09:50 - 10:30 - **Keynote: Professor Flemming Cassee (Royal Dutch National Institute for Public Health and the Environment, the Netherlands) – Adverse Health Effects of Traffic-Derived Emissions: Evidence from Studies in Volunteers, Experimental Animals and Cell-Based Systems**

10:30 - 11:10 - Coffee break / poster presentation / presentation of BOSMAL's emissions testing laboratory

Session 1: Automotive Emissions & Emissions Legislation

Chair: Piotr Bielaczyc (BOSMAL, Poland), Wolfgang Thiel (TRT, Germany)

- ♦ 11:10-11:50 - **Keynote: Alessandro Marotta (European Commission Joint Research Centre, Italy),**
co-authors: Biagio Ciuffo, Jelica Pavlovic, Simone Serra, Monica Tutuiianu (JRC, Italy)
– **An Overview of WLTP and its Implementation Plan in the European Legislation plus some Preliminary Comparison with NEDC**
- ♦ 11:50-12:10 - Kurt Engeljehring (AVL, Austria) – **The Changes and Challenges with the Upcoming (2017) European Passenger Car emission Regulation based on the WLTP Process**
- ♦ 12:10-12:40 - Les Hill (Horiba, UK) – **Trends in Automotive Emissions Legislation and Some of the Implications on Testing Systems**
- ♦ 12:40-13:00 - Professor Gordon Andrews (University of Leeds, UK) – **Real World Diesel Gaseous Emissions with some Comparison with Equivalent SI Real World Emissions**
- ♦ 13:00-13:20 - Dr. Piotr Bielaczyc (BOSMAL, Poland) – **An Overview of Exhaust Emissions from Modern LDV with IC Engines: a 2014 Update**

13:20-14:20 - Lunch

Session 2: Emissions Reduction Methods and Aftertreatment System Development for Light and Heavy Duty Applications

Chair: Massimiliano Lavana (CNH Industrial, Italy), Professor Jan Czerwinski (AFHB, Switzerland)

- ♦ 14:20-15:20 - **Keynote: Dr. Timothy V. Johnson (Advanced Technology Director, Corning incorporated, USA)**
– **Emerging Trends in Vehicular Emissions**
- ♦ 15:20-15:40 - Massimiliano Lavana (CNH Industrial/FPT Industrial, Italy) – **Development Trends of Aftertreatment (ATS) and Emissions Reduction Systems for Current and Future M-HD engines for On-Road vs. Off-Road Versions**
- ♦ 15:40-16:00 - Dr. Kentaro Iwasaki, Artur Narewski (Sumika Ceramics, Poland/Japan) – **Diesel Particulate Filter with Hexagonal-based Channel Structure/ Design and Validation**

16:00-16:30 - Coffee break / poster presentation / presentation of BOSMAL's engine testing laboratory

- ♦ 16:30-16:50 - Eike Martini (Continental Automotive GmbH , Germany) – **Model-Based Function Development and Calibration at Continental**
- ♦ 16:50-17:10 - Andreas Rainer, Dr. Hans-Michael Koegeler, David Rogers, Adam Lewandowski (AVL, Austria)
– **Iterative DoE - Improved Emission Models and Better Optimisation Results within a Shortened Measurement Time**

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Session 3: Nanoparticle Emissions from Internal Combustion Engines – Part 1

Chair – Wolfgang Thiel, (TRT, Germany) & Professor Jan Czerwinski (Univ. of Appl. Sciences Biel-Bienne, Switzerland)

- ♦ 17:10 - 17:30 - Giovanni D'Urbano (Federal Office of the Environment, Switzerland) – **Diesel Soot Reduction from Non-road Sources in Switzerland**
- ♦ 17:30 - 17:50 - Professor Jan Czerwinski (Univ. of Appl. Sciences Biel-Bienne), Pierre Comte (AFBH, Switzerland), Dr. Alejandro Keller, (FHNW, Switzerland), Dr. Andreas Mayer (TTM, Switzerland) – **Investigations of Nanoparticle Emissions of Two Gasoline Cars MPI & DI at Stationary Part Load Operation**
- ♦ 17:50 - 18:00 - Dr. Lucia Bustin, Hans-Georg Horn (TSI GmbH, Germany), Brian Osmondson, Jason Johnson (TSI Inc., USA) – **A Novel Portable Instrument for PN Emission Measurement**

20:00-24:00 – Symposium Dinner & Musical Soiree

Friday, 23rd May 2014

Session 3: Nanoparticle Emissions from Internal Combustion Engines – Part 2

Chair – Wolfgang Thiel, (TRT, Germany) & Dr. Andreas Mayer (TTM, Switzerland)

- ♦ 09:00 - 09:20 - Dr. Andreas Mayer (TTM, Switzerland) – **Health Effect Correlations to Particle Numbers - from Diesel or Petrol engines**
- ♦ 09:20 - 09:40 - Panu Karjalainen, Dr. Topi Ronkko, Professor Jorma Keskinen, (Tampere University of Technology, Finland) – **Exhaust Particles Under Transient Driving Conditions**

Session 4: Fuel and Lubricant Development

Chair: Dr. Amanda Lea-Langton (University of Leeds, UK) & Slawomir Poszeleznny (Lotos Oil, Poland)

- ♦ 09:40 - 10:20 - **Keynote: Dr. Thomas Wallner (Manager, Fuels, Engines & Aftertreatment, Center for Transportation Research, Argonne National Laboratory, USA) – Trends in Fuels for Light-Duty Vehicles - a US Perspective**

10:20-11:00 - Coffee break / poster presentation

- ♦ 11:00 - 11:20 - Dr. Asa Hakansson, Martynas Dilda, Knut Skardalsmo (Statoil Fuel & Retail - Europe, Norway) – **Evaluation of Gasoline Deposit Control and Friction Modifier Additives**
- ♦ 11:20 - 11:40 - Giammarco Gioco, Elena M. Rebesco, Pietro Scorletti (eni R&M, Italy), Tarcisio Cerri, Gianluca D'Errico, Angelo Onorati, (ICE Group - Politecnico di Milano, Italy) – **CFD Simulations of Diesel Combustion Characterized by Injectors Coking**
- ♦ 11:40 - 12:00 - Dr. Marc Walter, Uwe Lutz, Dr. Jochen Mezger (BASF SE, Germany) – **Control of Injector Deposits in Direct Injection Spark Ignition Engines**
- ♦ 12:00 - 12:20 - Dr. Robert Barbour, Dr. Robert Quigley, Dr. Avtar Panesar, James Payne, Brian Sword, (Lubrizol Limited, UK), Dr. David Arters, Dr. Jim Bush, Mr. Andrew Stevens (Lubrizol Corporation, Lubrizol Limited, USA) – **Finding a Solution to Internal Diesel Injector Deposits**
- ♦ 12:20 - 12:40 - Giovanni Cecconello (Petronas, Italy) – **From the Race Track to the Road - Lubricants Technologies Application for Efficiency Improvement and CO₂ reduction**
- ♦ 12:40 - 13:00 - Dr. Liisa Pirjola (Metropolia University of Applied Sciences, Finland) – **Emissions of a GDI Vehicle Operating with Different Composition Engine Oils: Laboratory and On-Road Studies**

Symposium Summary & Closing

- ♦ 13:00 - 13:20 - Professor Jerzy Merkisz (Poznan University of Technology/BOSMAL, Poland) – **Symposium Summary: Emissions & Fuel Development Trends for IC engines**

13:20-14:20 - Lunch

14:20-16:00 - Visit to BOSMAL's Testing Laboratories

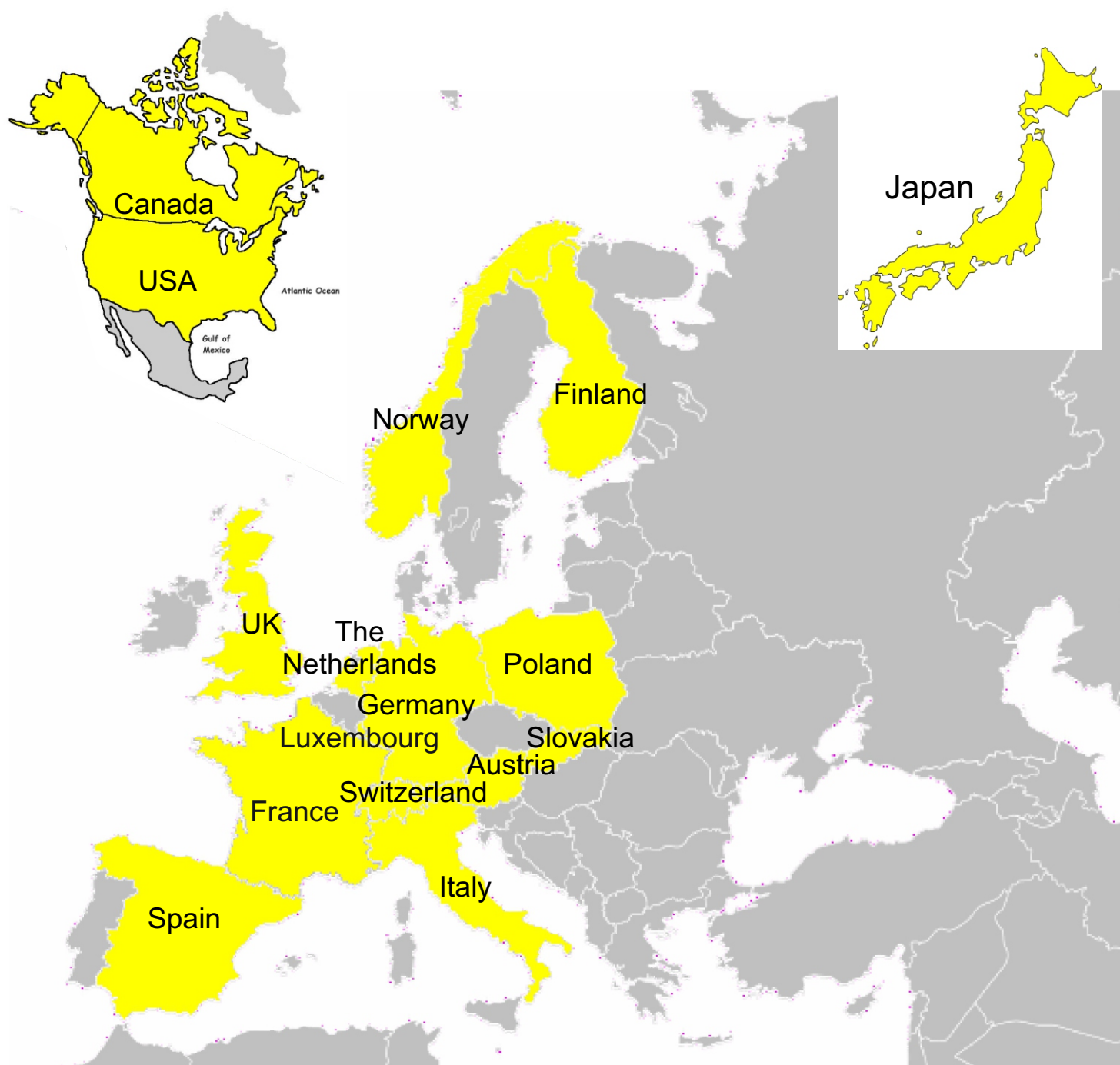
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Written only papers (presentation and abstract archived in the proceedings; poster presentation during the symposium)

- ♦ Joseph Woodburn (BOSMAL, Poland) – The Impact of Fuel Ethanol Content on Fuel Consumption and Exhaust Emissions of CO₂ From SI Engines
- ♦ Dr. Piotr Bielaczyc, Dr. Andrzej Szczotka, Joseph Woodburn (BOSMAL, Poland) – A Comparison of the Exhaust Emission and Performance of Euro 5/6 Bi-Fuel Vehicles fuelled with Petrol and CNG
- ♦ Rafal Sala (BOSMAL, Poland) – The Challenges in Development and In-Service Problems of Diesel Selective Catalytic Reduction (SCR) Systems
- ♦ Dr. Juha Tikkanen and Dr. Kauko Janka (Pegasor Oy, Finland) – Comparison of Pegasor Particle Sensor (PPS) Results from CVS and Tailpipe
- ♦ Professor Jerzy Merkisz, Dr. Jacek Pielecha (Poznan University of Technology, Poland) – On-Road Exhaust Emissions Using a Portable Emission Measurement System (PEMS)
- ♦ Professor Jerzy Merkisz, Dr. Piotr Lijewski, Dr. Paweł Fuc, Andrzej Ziolkowski (Poznan University of Technology, Poland), Professor Krzysztof Wojciechowski (AGH University of Science and Technology, Poland) – Investigations into the Possibilities of Using Thermoelectric Generators for Waste Energy Recovery in Non-Road Vehicles
- ♦ Zdzislaw Cieslikowski (Orlen, Poland) – The Role and Importance of Additives in Modern Motor Fuels
- ♦ Michal Olczyk, Jerzy Korzec, Adam Sordyl, Dr. Piotr Bielaczyc (BOSMAL, Poland) – The Impact of CNG Fuel on Diesel Engine Development – Dual Fuel Supply Concept
- ♦ Michal Olczyk, Krzysztof Mrozek, Adam Sordyl, Dr. Piotr Bielaczyc (BOSMAL, Poland) – Marine Recreational Engine Certification Test based on U.S. EPA rules, Performed on Engine Test Bench - Test Methodology
- ♦ Felipe Galvis (BOSMAL, Poland) – Computational Fluid Dynamics Applied to Engine Development and Exhaust Emissions Research
- ♦ Georg Steiner (AVL, Austria) – RDE - Real Driving Emission and Fuel Consumption, Discussion of Legislation, Powertrain Technologies and Measurement Trends
- ♦ Dr. Piotr Bielaczyc (BOSMAL, Poland) – The Impact of Fuel Containing Higher Ethanol Content on the Operation of Automotive Spark Ignited Engines
- ♦ Dr. Johannes Villinger, Werner Federer, Arno Weissnicht, Markus Hoenig (V&F Analyse und Messtechnik GmbH, Austria) – Significant Role of IMR-MS (Ion - Molecule Reaction Mass Spectrometry) Technology in Rapid Multi-Component Gas Analysis & its Importance in Today's Engine and Catalyst Development
- ♦ Dr. Piotr Bielaczyc, Joseph Woodburn, Dr. Piotr Pajdowski, Dr. Andrzej Szczotka, (BOSMAL, Poland) – A Preliminary Comparison of CO₂ Emissions from European Passenger Cars Tested Under Laboratory Conditions over the NEDC, WLTC and FTP-75 Test Cycles

4th International Exhaust Emissions Symposium 22-23 May 2014

We are hosting guests from the following countries:



4th International Exhaust Emissions Symposium 22-23 May 2014

Our guests:

AFHB University of Applied Sciences, **Switzerland**
 Argonne National Laboratory, **USA**
 AVL, **Austria**
 BASF SE, **Germany**
 BorgWarner, **Poland**
 Carelli Consulting, **Germany**
 CGS Analysen-, Mess- und Regeltechnik GmbH, **Germany**
 CNH Industrial / FPT Industrial, **Italy**
 Continental Automotive GmbH, **Germany**
 Corning Incorporated, **USA**
 Cracow University of Technology, **Poland**
 Dekra, **Germany**
 DieselNet, **Canada**
 Ecocat Italia Srl, **Italy**
 eni, **Italy**
 European Commission Joint Research Centre, **Italy**
 Federal Office for the Environment (FOEN) Air Pollution Control and Chemicals, **Switzerland**
 FGA, **Poland**
 Fiat Auto Poland, **Poland**
 Fiat Chrysler Automobiles, **Italy**
 Fiat Powertrain Technologies Poland sp. z o.o., **Poland**
 GM Manufacturing Poland, **Poland**
 GM Powertrain Europe, **Germany/Italy**
 Horiba, **Japan/UK/Austria**
 The International Council on Clean Transportation (Europe), **Germany**
 Johnson Matthey, **UK**
 Katcon, **Luxemburg/Poland**
 Landi Renzo, **Italy/Poland**
 Linde Gas, **Poland/Germany**
 LOTOS Oil, **Poland**
 Lubrizol, **USA/UK**
 Metropolia University of Applied Sciences, **Finland**
 Oil and Gas Institute, **Poland**
 Orlen Oil, **Poland**
 Orlen, **Poland**
 Pegasor, **Finland**
 Petronas, **Italy**
 Politecnico di Torino, **Italy**
 Poznan University of Technology, **Poland**
 RIVM - Royal Dutch National Institute for Public Health and the Environment, **the Netherlands**
 Rzeszow University of Technology, **Poland**
 Statoil Fuel & Retail - Europe, **Norway**
 Sumika Ceramics, **Japan/Poland**
 Tampere University of Technology, **Finland**
 Tenneco Automotive Polska, **Poland**
 TRT Engineering GmbH, **Germany**
 TSI, **USA/Germany**
 TTM, **Switzerland**
 Umicore, **Germany**
 University of Applied Sciences Biel-Bienne, **Switzerland**
 University of Bielsko-Biala, **Poland**
 University of Leeds, **UK**
 V&F Analyse und Messtechnik GmbH, **Austria**
 Wartsila, **Finland**
 WDL Power, **UK**

4th International Exhaust Emissions Symposium 22-23 May 2014

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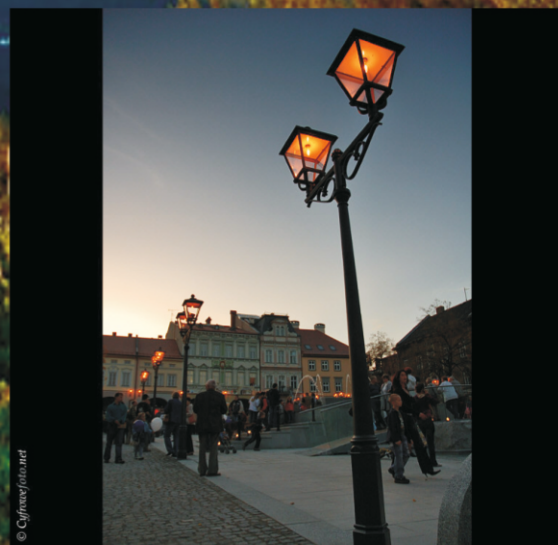
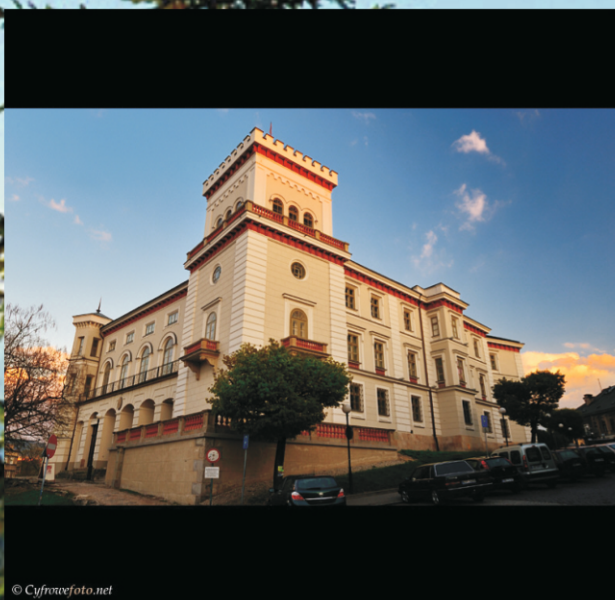


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