

SAE 2009

Particle Emissions of 2-Stroke Scooters

Science, Problems, Solutions & Perspectives



June 11 – 12, 2009
Autodromo Nazionale Monza
Milano, Italy

Hosted by:



Pre-register by May 22, 2009 and SAVE \$100. SAE Members SAVE \$400 off the full conference registration fee.

www.sae.org/scooters



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Escalating fuel prices and greater traffic congestion have made the fuel efficient scooter a popular alternative for commuters all over the world. And while they have been the preferred mode of transportation in Asia and Europe, their convenience has increased their popularity in the US as well.

The increasing popularity of this convenient mode of transportation has created a growing tailpipe emissions problem. Small scooters, which are very much used in the congested centers of many major cities, are a major contributor to air pollution. The pollutants from scooters cause eye irritation, coughing, wheezing, shortness of breath and even permanent lung damage.

Current legislation in the United States and Europe is mandating tighter restrictions on the tail-pipe emissions of 2-stroke scooters. Even tighter restrictions are planned for the US in 2010 and are under development in Europe.

Participate in the first event dedicated to discussion of the regulations AND the technology solutions being developed to achieve the mandates required by the governments of Europe and the US.

- Hear and discuss problems and solutions for pollutants of 2-stroke scooters
- Network with leading engineers, scientists and government officials spearheading the search for a solution
- Tour facilities of the European Commission's Joint Research Centre and the Autodromo Nazionale Monza

Join experts from key organizations in discussions on key technology issues and solutions including:

- Legislation & regulations
- Emissions & noise inventories
- Comparisons of 2-strokes & 4-strokes
- CO₂ emissions & fuel consumption
- Toxicity & health effects
- OEM developments

www.sae.org/scooters

Technical Program

(program subject to change; check www.sae.org/scooters for the most up-to-date program information)

Day

Physical & Chemical Characterization of Emissions from 2-Stroke Motorcycles

T. Adam, C. Astorga, G. Martini, A. Farfaletti, U. Manfredi, L. Montero, A. Krasenbrink, B. Larsen and G. De Santi, *EC-JRC, Transport and Air Quality Unit*

Study on Possible New Measures Concerning Motorcycle Emissions

Savas Geivanidis, Leonidas Ntziachristos, Zissis Samaras, Anastasios Xanthopoulos, Aristotle University of Thessaloniki; Heinz Steven, TÜV Nord Mobilität GmbH & Co. KG; Bernd Bugsel, BAST Federal Highway Research Institute of Germany

Emission Performance and Evolution over Mileage of Modern Low-displacement, Two-stroke Scooters in Statutory and Real-world Cycles

Robert Alvarez, Christian Bach, Martin Weilenmann, Empa Swiss Federal Laboratories for Materials Testing and Research, Laboratory for Internal Combustion Engines

The Solid-Volatile Challenge of Nanoparticle Emissions from 2-Stroke Scooters

M. Kasper, T. Mosimann, Matter Engineering AG; P. Comte, AFHB, University of Applied Sciences

Low Pressure Fuel Injection Strategies for Low Emission Two-stroke Scooter Engines

Franz Winkler, Roland Kirchberger, Graz University of Technology Institute for Internal Combustion Engines and Thermodynamics Engine Research

Regulated and Unregulated Emissions of Mopeds

M.V. Prati, Istituto Motori of National Research Council; A. Unich, Second University of Naples; M.A. Costagliola, University of Naples

Recent Research Activities on Particle Emissions from Two-stroke Mopeds Performed at ENEA

P. Spezzano, P. Picini, D. Cataldi, F. Messale, C. Manni, E. Donato, *ENEA- ACS PROTANT- Via Enrico Fermi*

Combinations of Technical Measures for Reduction of Particle Emissions & Toxicity of 2-S Scooters

Jan Czerwinski, Pierre Comte, University of Applied Sciences, Biel-Bienne, Switzerland (AFHB); Maria C. Astorga, Thomas Adam, EU Joint Research Center, (EC JRC); Andreas Mayer, Technik Thermische Maschinen, Switzerland (TTM); Felix Reutimann, Federal Office of Environment, Switzerland

The Effect of (Hydrous) Ethanol on the Emission and Performances of 2- and 4-stroke Scooters

Michiel Makkee, Catalysis Engineering, Faculty Applied Sciences, Technical University Delft; Jan Czerwinski, Pierre Comte, Laboratory for IC-Engines and Exhaust Emission Control (AFHB), University of Applied Sciences, Biel-Bienne

Effects of Ethanol-gasoline Blends on Exhaust Emissions for a Two-stroke Motorcycle

Jiun-Horn Tsai, Yung-Chen Yao, Wei-Ting Chang, Ting-Hsien Yan, Department of Environmental Engineering, National Cheng Kung University, Taiwan

Electric Scooters: Technologies and Markets

Urs Schwegler, NewRide

Day 2

Prevalidation of In-vitro Continuous Flow Exposure Systems as Alternatives to In-vivo Inhalation Engine Emission Safety Evaluation Experimentations Outcome from MAAPHRI-PCRD5 Research Program

Jean-Paul Morin, Mamadou Fall, *INSERM U644 – Université de Rouen*; Virginie Hasson, *INSERM U644 – Université de Rouen and CERTAM*; Eleni Papaioanou, Athanasios Konstandopoulos, *APTL – CERTH*; David Preterre, Frantz Gouriou, Veronika Keravec, Frédéric Dionnet, *CERTAM*

Cytotoxicity and Inflammatory Potential of Two Stroke Scooter Exhaust in Lung Cells In-vitro

Loretta Müller, Peter Gehr, Barbara Rothen-Rutishauser, *Institute of Anatomy, University of Bern*; Pierre Comte, Jan Czerwinski, *AFHB, University of Applied Sciences*; Markus Kasper, *Matter Engineering AG, Nanoparticle Measurement*; Andreas C.R. Mayer, *Technik Thermische Maschinen (TTM)*

Analysis of Exposure Levels to Particle Matter of Cyclists and Car Drivers in 11 Dutch Cities

Frank Borgman, Miriam van Bree, Fietsersbond, *Dutch Cyclists Union*

Characterization of Submicron Particles in Scooter Parking Garage

Jie-Ming Shih, Dai-Hua Tsai, Chang-Chuan Chan, *Institute of Occupational Medicine and Industrial Hygiene, College of Public Health, National Taiwan University*

SAE Seminars Come to Italy!

Introduction to Hybrid and Electric Vehicle Battery Systems Seminar

June 15-16, 2009; Grand Hotel Mediterraneo, Florence, Italy

Instructor: Eric Spek

SAE Members: \$995;

Non-Members: \$1,115; 1.3 CEUs

This seminar will introduce participants to the concepts of hybrid vehicles, their missions and the role of batteries in fulfilling those requirements. Battery topics including limitations, trends in hybrid development, customer wants and needs, battery system development timelines, comparison of electrochemistries and safety will be examined.

When registering, refer to I.D. #C0626 (requires separate registration)

NEW! Improving Fuel Efficiency with Engine Oils Seminar

June 16-17, 2009; Grand Hotel Mediterraneo, Florence, Italy

Instructor: Ewa Bardasz

SAE Members: \$995;

Non-Members: \$1,115; 1.3 CEUs

This seminar will highlight the role of lubricants in improving fuel efficiency and provide strategies for selecting the best oil for a given application.

When registering, refer to I.D. #C0914 (requires separate registration)

Attendees to the SAE 2009 International Powertrains, Fuels & Lubricants Meeting receive \$100 off the fee to one or both of these seminars.

Registration, Hotel & Travel

Category	By 5/22/09	After 5/22/09 and ON SITE
SAE Member	\$595	\$695
Non-Member*	\$895	\$995
Participant (includes organizers, presenter - limit one per presentation)	\$395	\$495
Exhibitor Booth Personnel (Limit 1 per booth)	FREE	FREE

Conditions of Sale - All cancellations must be in writing and received by SAE prior to May 22, 2009. A \$50 processing fee will be assessed for each cancelled registration that results in a refund. Refunds will not be issued if cancellation occurs on or after May 22, 2009. This policy includes special event and meal fees. For the SAE membership registration rates, member dues must be current at the start of the event. Children under 16 years of age are not permitted.



SAE will do what is feasible to make its events reasonably accessible to attendees. If you have special accommodation needs, please let us know in advance by calling 1-877-606-7323 (1-724-776-4970 outside U.S. and Canada). Accommodations requested on site will be provided only if possible for us to do so on short notice.

* Includes one year of SAE membership.

Registration includes: a.m./p.m. breaks, lunch, receptions and a walking tour of Autodromo

Registration Hours

Wednesday, June 10, 2009 19:00 – 21:00
 Thursday, June 11, 2009 08:00 – 17:00
 Friday, June 12, 2009 08:00 – 11:00

Special Offer for Powertrains, Fuels & Lubricants Meeting Attendees!

Attend the 2009 International Powertrains, Fuels & Lubricants Meeting and receive a \$100 discount on your registration for the SAE 2009 Particle Emissions of 2-Stroke Scooters Symposium.

Hotel & Travel

SAE has not contracted for a block of hotel rooms for this event. All attendees are responsible for making their own lodging and travel arrangements. The following is provided for your convenience.

Host Hotel

Grand Hotel Barone Di Sassj
 Via Padovani 38
 Sesto San Giovanni, Italy 20099
 +39 022414 01
<http://www.caltahotel.it/>

Transportation/Shuttle Service

Wednesday, June 10th: Bus service will be offered free of charge from Milano Centrale train station to Grand hotel de Sassj at two different hours (16:00 and 17:00).

Thursday, June 11th and Friday, June 12th: Busses will depart the Grand Hotel for the Autodromo. Autodromo times to be announced.

Friday, June 12th and Saturday, June 13th: Busses will make one run from the Grand Hotel to Milano Centrale Train station on Friday evening and Saturday morning. Both airports can be reached from Milano Centrale train station. Times to be announced.

Visit www.sae.org/scooters for additional travel information

Related Resources



Engine Testing: Theory & Practice, Third Edition

AUTHOR(S): Michael James Plint and Tony Martyr

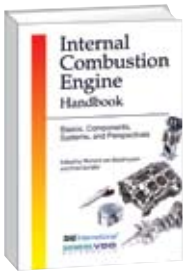
This book brings together the large and scattered body of information on the theory and practice of engine testing, to which any engineer

responsible for work of this kind must have access. This updated third edition features substantially revised chapters, a number of new chapters, and a new order of topics.

SAE Member Price: \$79.96;

Non-member Price: \$99.95

Product Code: R-382



Internal Combustion Engine Handbook - Basics, Components, Systems, and Perspectives

AUTHOR(S): Richard Van Basshuysen and Fred Schaefer

Thorough in its presentation, this resource illustrates

knowledge in engine development, paying particular attention to the presentation of theory and practice in a balanced ratio.

Member Price: \$119.96;

Non-member Price: \$149.95

Product Code: R-345



Modern Engine Technology from A to Z

AUTHOR(S): Richard Van Basshuysen and Fred Schaefer

Part dictionary, part encyclopedia, Modern Engine Technology from A to Z will serve as your comprehensive

reference guide for many years to come.

Member Price: \$103.96

Non-member Price: \$129.95

Product Code: R-373

Events

SAE 2009 International Powertrains, Fuels & Lubricants Meeting

June 15 - 17, 2009, Florence, Italy

Facing the Challenge of Future CO2 Targets: Impact on European Passenger Car Technologies

June 18 - 19, 2009, Turin, Italy

Professional Development

Seminars

Diesel Engine Technology

May 11 - 12, 2009; Palais des Congres of Lyon; Lyon, France

SAE Members: \$1,145;

Non-members: \$1,265; 1.3 CEUs

When registering, refer to I.D. #93014

Combustion and Emissions for Engineers

August 24 - 26, 2009; SAE Automotive Headquarters; Troy, Michigan USA

SAE Members: \$1,225;

Non-members: \$1,355; 1.8 CEUs

When registering, refer to I.D. #97011

See www.sae.org/seminars for additional seminar offerings

e-Seminars

The Basics of Internal Combustion Engines e-Seminar

(also available as a Seminar – C0103)

Members: \$895;

Non-members: \$995; 1.3 CEUs

Telephone/Webcasts

Electrifying the Powertrain: Search for More Efficient Alternatives to the Internal Combustion Engine

May 2009

The Future of Green Fuels: Understanding the Facts and Myths Surrounding Biofuels from Well to Wheels

June 2009

Visit www.sae.org/telewebcasts for more information

Marketing Solutions

Symposium Partner – Collaborate with SAE to distinguish your company at this symposium. Choose one of the partner programs, an exclusive sponsorship or get creative with a customized package! Promote your company to top industry professionals and other attendees.

GOLD PARTNER - \$7,500 (USD)

(Limited to 1 company)

Includes:

- Table top display space
- Recognition as the EXCLUSIVE host of the Networking Reception (Thursday night)
- Opportunity to provide a gift to all reception attendees (at sponsor's expense)
- Complimentary registration for three (3) symposium participants
- Display of logo on sponsor signage at the event
- Recognition in symposium Event Guide
- Logo and hyperlink on the Sponsor event page of the SAE program
- Recognition on the event sponsors page of the SAE website
- Inside Front Cover Position in Event Guide - Full Page Color Ad

SILVER PARTNER - \$5,000 (USD)

(Limited to 2 companies)

Includes:

- Recognition as exclusive host of one of the two daily lunches
- Complimentary registration for two (2) symposium participants
- Opportunity to provide a gift to all lunch attendees (at sponsor's expense)
- Display of logo on sponsor signage at the event
- Recognition in the symposium Event Guide
- Recognition on the event sponsor page of the SAE website
- Choice of Cover 2 or Cover 3 of the Event Guide - Full Page Color Ad

BRONZE PARTNER - \$2,500 (USD)

Includes:

- Recognition as exclusive host of one of the daily networking coffee breaks
- Complimentary registration for one (1) symposium participant
- Company logo on sponsor signage at the event
- Recognition in the symposium Event Guide
- Recognition on the event sponsors page of the SAE website

FRIENDS OF THE INDUSTRY - \$500 (USD)

Includes:

- Company logo on sponsor signage
- Recognition in the symposium Event Guide
- Recognition on the event sponsors page of the SAE website

ADDITIONAL SPONSORSHIPS AVAILABLE

WELCOME RECEPTION SPONSOR AT HOTEL MONZA- \$5000 (USD)

Includes:

- Exclusive Host Recognition of the Welcome Reception at Hotel Monza (A drink and light refreshment will be offered)
- Company logo on Sponsor Signage
- Opportunity to provide a small gift to attendees (at sponsors expense)
- Sponsor Recognition in Event Guide
- Complimentary registration for (2) symposium participants

Name Badge

Lanyards \$2,500 (USD)

Official Conference Pens and Notepads.... \$1,500 (USD) each

Sponsor both for \$2,500

Customized Sponsorships Available!

FOR MORE INFORMATION CONTACT:

Jim Browne - Events Manager

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Email: jbrowne@sae.org

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