SAE International®

"The society dedicated to advancing mobility engineering worldwide"

SAE 2012 SUMMER TECHNOLOGY WEEK

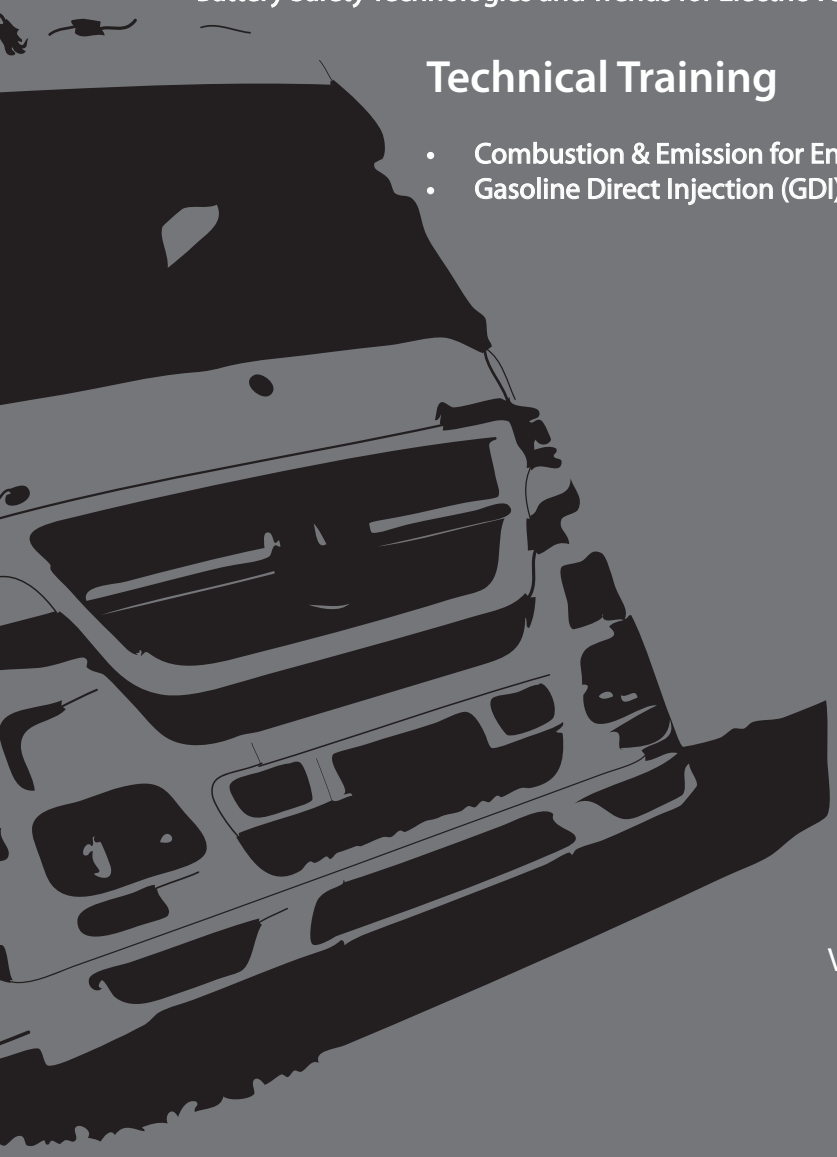
Technical Symposia

- High Efficiency IC Engine Systems and Directions
- Emissions Standards, Controls, and Future Challenges (On- & Off-Highway and Light Duty Vehicles)
- Vehicle System Optimization and Control
- Battery Safety Technologies and Trends for Electric Vehicle Applications

August 13-17, 2012
Tianjin, China

Technical Training

- Combustion & Emission for Engineers (C1123)
- Gasoline Direct Injection (GDI) Engines (C1009)



Choose from 1-4 days of technical exchange: Three (1) day meetings on Automotive Powertrain and System Optimization technologies and one day on Battery Safety for New Energy Vehicles. Need training? Two courses are available: Combustion and Emissions and Gasoline Direct Injection.

ATTEND, EXHIBIT, SPONSOR

More Information & Register:

Visit the SAE International Events Website in China

www.saeinternational.org

Overview

Technical Symposia

August 14 High Efficiency IC Engine Systems and Directions

August 15 Emissions Standards, Controls, and Future Challenges (On- & Off-Highway and Light Duty Vehicles)

August 16 Vehicle System Optimization and Control

August 17 Battery Safety Technologies and Trends for Electric Vehicle Applications

Technical Training

August 14-15 Combustion & Emission for Engineers (C1123)

August 16-17 Gasoline Direct Injection (GDI) Engines (C1009)

Venue

Technical Symposia

Renaissance Tianjin TEDA Convention Center Hotel

Address: 29 2nd Avenue, TEDA, Binhai New Area, Tianjin, P.R. China

Technical Seminar

Tianjin Binhai Easthabor Hotel

Address: 31 No.3 Aveune, TEDA, Binhai New Area, Tianjin P.R. China

About us:

SAE International is a global association of more than 134,000 engineers and related technical experts in the aerospace, automotive and commercial-vehicle industries. SAE International's core competencies are life-long learning and voluntary consensus standards development.

Technical Symposia ①

August 14, Tuesday - High Efficiency IC Engine Systems and Directions

Sean Milloy Chief Technical Officer Engine Business, Cummins	Keynote
Robert Wagner Director Fuels Engines and Emissions Research Center Oakridge National Laboratory	Enabling the Next Generation of High Efficiency Engines – Opportunities and Challenges of New Technologies and an Ever Expanding Parameter Space
Christopher Thomas Vice President Advanced Engineering, Engine Group BorgWarner	Methods for Reducing the Pumping Losses of Engines
Shin Hyuk(Michael)Joo Senior Research Engineer Engine, Emissions and Vehicle Research Division Southwest Research Institute	High Efficiency Dilute Gasoline Engines
Damien Guillard Valeo	Cooled EGR for Turbo SI Engines GDI & MPI
Mingfa YAO Executive Deputy Director State Key Laboratory of Engines Tianjin University	Challenge of the Engine Combustion Technology with High Efficiency and Low Emissions
Zhen HUANG Cheung Kong Chair Professor of Ministry of Education Vice President, Shanghai Jiao Tong University Dean, Energy Research Institute, SJTU	Fuel Design for Engine Low Temperature Combustion
Jeff Lewis Director Business Development AVL in Graz, Austria	Electrification and Transmissions

*More Detailed Information, Please Visit **www.saeinternational.org**

Technical Symposia ②

August 15 Wednesday - Emissions Standards, Controls, and Future Challenges (On- & Off-Highway and Light Duty Vehicles)

Tinghong Tao Director Regional Technology in Asia Corning Environmental Technologies	Keynote on Vehicle Emissions Developments – Technology trends and Emerging Challenges
Yuan Shen Engine Development Division Zhejiang Geely Automobile	Down-sizing/Down-Speeding to Meet the Future Legislation in China
Zhanteng Chang Chief Technical Expert Electonic Calibration Weichai Power Technical Center	Development of Heavy-Duty Diesel Engines to Meet Future Legislation
Masatoshi Shimoda Adviser, Technical Research Center Hino Motors	Clean Heavy Duty Diesel Development
Kevin Bailey Manager Engine Engineering in China John Deere Power Systems	Engine Emissions – Impact on Off-Highway Equipment
Rui Chen Professor Loughborough University	TBA
Hui XIE Director State Key Laboratory of Engines, Tianjin University	TBA

*More Detailed Information,
Please Visit **www.saeinternational.org**

Technical Symposia ③

August 16 Thursday - Vehicle System Optimization and Control

Shin Hyuk(Michael)Joo Senior Research Engineer Engine, Emissions and Vehicle Research Division Southwest Research Institute	Hybrid Systems
Xiaolu GUO Director System and Electronic Control Unit Development United Automotive Electronic Systems Technical Center	Fuel Saving Technologies for Vehicle Powertrain
Paul Chambon Research Engineer Energy and Transportation Science Division Oakridge National Laboratory	Advanced Powertrain Controls Development Techniques: Integrating Modeling with Transient Experimentation
Xi (Richard) Du Director Infineon Technology, Emerging Markets Business for Powertrain, Safety and ASIC Device	Vehicle Electrification Systems Optimization and Control
Shih-Che Tseng Technical Manager dSPACE Mechatronic Control Technology (Shanghai) Co., Ltd.	TBA
Hui Zhang General Manager Lotus Engineering	TBA
Jianqiu LI Professor Department of Automotive Engineering Tsinghua University	TBA

*More Detailed Information, Please Visit **www.saeinternational.org**

Technical Symposia ④

August 17 Friday - Battery Safety Technologies and Trends for Electric Vehicle Applications

Chengwei Xiao Battery Principal Expert, Professor Senior Engineer China Electonics Technology Group Corporation No. 8 Institute	Keynote - National 863 program on energy savings and new energy sources
Jeff XU Principal Scientist Electric Vehicle Development Program Southwest Research Institute	Thermal Characteristics of Various Lithium Ion Battery Chemistry
Junkui GAO Executive Vice President, Assistant Dean Lishen Research Institute	Advanced Lithium Batteries
Long HE Vice President BYD Co., Ltd.	Battery Safety
Steve M. Lipka Adjunct Faculty Member Department of Electrical and Computer Engineering in the Center for Applied Energy University of Kentucky	Safety Issues in Li-Ion Cells
Zhengming (John) Zhang Vice President and Chief Technical Officer Celgard LLC	Li-ion Safety and Its Associated Porous Electrode
Troy A. Hayes Principal Engineer Materials and Corrosion practice Exponent China	Material Challenges and Failure Analysis
Patrick Ziegler Bosch	Battery Management Safety

*More Detailed Information, Please Visit **www.saeinternational.org**

Combustion and Emissions for Engineers (C1223)

Public awareness regarding pollutants and their adverse health effects has created an urgent need for engineers to better understand the combustion process as well as the pollutants formed as by-products of that process. To effectively contribute to emission control strategies and design and develop emission control systems and components, a good understanding of the physical and mathematical principles of the combustion process is necessary. This seminar will bring issues related to combustion and emissions "down to earth," relying less on mathematical terms and more on physical explanations and analogies.

Learning Objectives

By attending this seminar, you will be able to:

- Identify and describe the important processes in combustion and emission
- Identify the formation mechanisms and reduction strategies of pollutant species in combustion systems
- Recognize the effects of engine design and operating conditions on combustion and emission
- Explain the technology and the logic behind after-treatment of pollutants
- Identify the underlying laws and principles used in combustion and emission black-boxed computer programs
- Explain the role chemical kinetics plays in the design of low-emission combustion systems
- Identify design trade-offs between increasing engine performance and maintaining low emission characteristics

Who Should Attend

Engineers working on the design of combustion engine components, software development and application for modeling of thermal-fluid, combustion and emissions processes, and those working on the reduction of harmful pollutants emissions will find this course valuable.

Topical Outline

- Fuel
- Air
- Combustion Thermodynamics
- Combustion Chemistry
- Auto-Ignition
- Knock
- Flame Propagation/Burning Speed
- Combustion in SI Engines
- Emission of Major Pollutants
  - o NOx
  - o Unburned Hydrocarbons (UHC)
  - o CO, CO2
- Effects of Some Parameters on Emissions

2.0 CEUs
You must complete all course contact hours and successfully pass the learning assessment to obtain CEUs.

Instructor:

Mr. Bruce Chehroudi (Please find Instructor's Bio on Page 7)

Gasoline Direct Injection (GDI) Engines (C1009)

The quest for more efficient, smarter, and environmentally cleaner liquid-fueled spark ignition (SI) reciprocating engines is more alive and intense now than ever before. GDI SI engines have overcome many of the original limitations and are now becoming commonplace. This seminar will provide a comprehensive overview of GDI engines. Mixture preparation and the combustion process, with an emphasis on strategies for both homogenous and stratified charge operation and control, including issues related to the direct injection of gasoline into the combustion chamber, and fuel injection system requirements for optimal spray characteristics will be explored. Emission of pollutants, fuel economy and effects of some key design and operating parameters will also be covered. The seminar concludes with an overview of a select list of production and prototype GDI engines.

Learning Objectives

Upon completion of this seminar, you will be able to:

- Describe the rationale behind the GDI engine operation
- Analyze the important processes in GDI engines
- Explain liquid atomization, sprays, and injector requirements for successful GDI operation
- Utilize the technology and the logic behind gasoline direct injection
- Estimate and predict effects of key engine design and operating conditions on performance, combustion, and emission in GDI engines
- Communicate effectively with engineers working on fuel injection, combustion and emission aspects of the GDI engine in your firm or with customers
- Effectively contribute to the design of critical components such as combustion chambers, injectors, and emission reduction strategies
- Explain and utilize trade-offs between increasing engine performance and maintaining low emission characteristics

Who Should Attend

This seminar will be especially valuable for engineers, technical and project managers, researchers, and academicians. Engineers working on the design of components for high efficiency and performance of GDI engines as well as those directly and indirectly involved in mixture preparation and emission reduction of harmful pollutants from these engines will highly benefit from this course. Environmental engineers desiring to expand their understanding of fuel spray formation, combustion and emissions from GDI engines will benefit, as well as, engineers active in the development and application of software for the modeling and design of combustion chambers, fuel spray dynamics, combustion and emission issues.

Prerequisites

Attendees should have general knowledge of engine operation especially in-cylinder combustion processes. However, a very concise review of the subject is presented.

Topical Outline

DAY ONE

- Combustion Systems
  - o Relative position of spark plug and fuel injector
  - o How to achieve homogeneous and stratified charge -- spray-, wall-, and air-guided combustion systems

- Fuel Injection System
  - o Fuel injection system requirements
  - o Fuel injector requirements and classification
- Fuel Spray Characteristics
  - o Spray atomization requirements
  - o Sac spray consideration
  - o After-injection
  - o Fuel spray penetration and cone angle
  - o Split injection
  - o Sprays characteristics of injectors
  - o Effects of ambient pressure (density) on spray
  - o Spray characterization (GDI)

DAY TWO

- Mixture Formation
  - o In-cylinder flow characteristics and GDI combustion
  - o Fuel-air mixing process
  - o Spray-wall interactions
  - o Cold start and wall wetting issues
- Combustion Process and Control Strategies
- Engine Operating Modes and Fuel Injection Strategies
  - o Early-injection, late-injection, stoichiometric operation
  - o Operating mode transition
- Split Injection Strategy
  - o Two-stage, split, and post injection
- Combustion characteristics
  - o Homogeneous-charge and stratified-charge combustion
- Effects of Engine Operating and Design Parameters on GDI Combustion
- Injection and ignition timings
  - o Spray cone angle
  - o EGR
  - o Knock resistance characteristics
  - o Air-assisted versus single-fluid GDI fuel system
- Injector, Combustion Chamber, and Intake Valve Deposits

DAY THREE

- Emissions of Pollutants - Reduction Approaches
  - o Hydrocarbon, NOx, particulate and noise emissions
- Fuel Economy
  - o Factors affecting improved fuel economy
  - o Fuel economy versus emissions compromise
- Select Gasoline Direct-Injection Engines
  - o Early DISC engine
  - o Mitsubishi reverse-tumble-based wall-guided
  - o Concise review of Toyota, Nissan swirl-based (wall-guided), Audi wall-guided, AVL, FEV air-guided, Ford, Honda spray-guided, Isuzu, Mazda swirl-based, wall-guided, Mercedes-Benz spray-guided, Ricardo tumble-based, wall-guided, Volkswagen tumble-based, wall-guided FSI
- GDI Fuel Rail Technology
- Benefits of Turbocharging a GDI engine

2.0 CEUs
You must complete all course contact hours and successfully pass the learning assessment to obtain CEUs.

Instructor:

Mr. Bruce Chehroudi

Dr. Chehroudi is Chief Scientist and Group Leader at Advanced Technology Consultants. His previous positions include: Principal Scientist at Air Force Research Laboratory (AFRL/ERC), Chief Scientist at Raytheon STX (formerly Hughes Aircraft STX), Professor of Mechanical Engineering, and Research Staff Member at Princeton University. He specializes in fluid mechanics and heat transfer, laser optical diagnostics, internal combustion engine, gas turbine and rocket engines, structure of sprays, gas turbine engines, combustion, fuel injection issues and emission of pollutants.

Dr. Chehroudi is an AIAA Associate Fellow, a member of Ta Beta Pi and the recipient of several SAE awards including the Arch T. Colwell Merit Award, the Ralph R. Teetor Award, the SAE Recognition Award and the SAE Forest R. McFarland Award in recognition of his efforts and leadership in contributions to the Continuing Professional Development Seminars. He has taught courses in the areas of internal combustion engines, thermodynamics, thermophysics of gas flows, combustion, and measurement system, and has more than 150 publications and over 200 presentations in conferences, national and international journals. Dr. Chehroudi has a Ph.D from Princeton University.

Registration, Hotel and Transportation

Register Now!
http://www.saeinternational.org

Contact Us

Registration Information

Shanghai Riverfront
Contact: **Miss Melody Hu**
Phone: 021-6439-3379
Fax: 021-6439-3232
Email: melodyhu@shriverfront.com

More Detailed Information for Events

SAE International China Office
Contact: **Mr. Rick Wang**
Phone: 021-6157-7364
Fax: 021-2302-5988
Email: rickwang@sae.org

Registration Fee

Symposia*	RMB/CNY*	USD*
Attend 1 Day Symposium	CNY 2,500	USD 400
Attend 2 Days Symposia	CNY 4,500	USD 700
Attend 3 Days Symposia	CNY 6,300	USD 1,000
Attend 4 Days Symposia	CNY 8,000	USD 1,250

Conditions of Sale:
Payment must accompany this form by July 31, 2012. All cancellations must be received by Shanghai Riverfront prior to July 31, 2012. A CNY 300 processing fee will be assessed for each canceled registration that results in a refund. Refunds for special event/meal tickets will not be processed after July 31, 2012. Refunds will not be issued if cancellation occurs on or after July 31, 2012.

* **Registration fee includes:** Digital Presentation Slides, Lunch, visit the exhibition, Networking Coffee Break, and English-Chinese, Chinese-English Simulation Interpretation.

Training Seminar**	China Resident or SAE Member		Non-China Resident Non-SAE Member	
	RMB/CNY	USD	RMB/CNY	USD
Combustion & Emission for Engineers (C1123) 2 days	CNY 2,700	USD 425	CNY 3,300	USD 525
Gasoline Direct Injection Engines (C1009) 3 days	CNY 4,000	USD 625	CNY 4,600	USD 720
Two Courses (C1123+C1009) 5 days	CNY 6,000	USD 945	CNY 7,100	USD 1,100

**Registration fee includes: Hardcopy Presentation Slides, Lunch and Networking Coffee Break.

Hotel Information

SAE International has reserved a block of rooms for this event at the Renaissance Tianjin TEDA Convention Center Hotel (5 Stars) & Tianjin Binhai Easthabor Hotel (4 Stars Standard). All attendees are responsible for making their own lodging and travel arrangements.

Technical Symposia (Venue)

Renaissance Tianjin TEDA Convention Center Hotel (5 Stars)

Address: 29 2nd Avenue, TEDA, Binhai New Area, Tianjin, P.R. China
Phone: +86-22-66218888
Fax: +86-22-66219999
http://www.marriott.com.cn/hotels/travel/tsntj-renaissance-tianjin-teda-convention-centre-hotel/

Special Rate

Single/Double Beds Room: CNY680/night
(includes services charge, breakfast, free internet for Marriott Member)

Technical Training Seminar (Venue)

Tianjin Binhai Easthabor Hotel (4 Stars Standard)

Address: 31 No.3 Avenue, TEDA, Binhai New Area, Tianjin P.R. China
Phone: +86-22-25291111
Fax: +86-22-25299988
http://hotels.ctrip.com/hotel/56527.html

Special Rate

Single Bed Room: RMB328/night
(includes services charge, one breakfast, free internet)
Double-Bed Room:RMB360/night
(includes services charge, one breakfast, free internet)

***Two hotels only 2 blocks away and 10-minute walk away.**
Download the reserveration form on the website: www.saeinternational.org

Marketing Solutions (Only for Technical Symposia)

Regardless of your budget, SAE International offers marketing solutions to showcase your products and services to this very diverse and influential audience. This event is the ideal forum to meet leading professionals involved in the rapidly expanding electric motor market and increase your organization's visibility on a truly global level.

TABLETOP EXHIBIT DISPLAY……..$4,250*(USD)

Includes:

- One (1) tabletop display space for the entire week – 6' x 30" table with 2 chairs
- One (1) Full Registration for EACH EVENT
  - o Includes all sessions, luncheons, keynotes, refreshment breaks, copy of the program materials
- Company recognition and profile in the Event Guide

* One Day Tabletop Exhibit Display is available, the price is $ 2,000(USD), more detailed information please contact with our sales representative.

GOLD PARTNER & LUNCHEON SPONSOR……$5,500(USD)

- Exclusive Host of one of the Luncheons of Symposia
- One (1) Full Registration for DAY OF SPONSORSHIP
  - o Includes all sessions, luncheons, keynotes, refreshment breaks, copy of the program materials
- Company recognition as a Gold Partner in the program materials
- Company Logo as a Gold Partner on the Stage Banner.
- Opportunity to provide a gift to all luncheon attendees (Opportunity at sponsor's expense.)
- One (1) complimentary tabletop exhibit for day of the sponsorship

SILVER PARTNER & BREAK SPONSOR……$4,000(USD)

- Exclusive Host of morning and afternoon breaks for one day.
- One (1) Full Registration for DAY OF SPONSORSHIP
  - o Includes all sessions, luncheons, keynotes, refreshment breaks, copy of the program materials
- Company recognition as a Silver Partner in the program materials
- One (1) complimentary tabletop exhibit for day of sponsorship

CONFERENCE LANYARDS ……$2,500(USD)

- EXCLUSIVE sponsor of the Conference Lanyards with your corporate logo or message
- Corporate logo on electronic Registration confirmation page for all attendees
- Company recognition in the program materials

CONFERENCE NOTEPADS and/or PENS ……$1,500 each or both for $2,250(USD)

- Company recognition as the EXCLUSIVE sponsor of the Notepads and/or Pens
- Company recognition in the program materials
- Company recognition on the event web page with hyperlink to the sponsor's homepage
- Display of sponsor's logo on the "all-sponsor" signage

"FRIEND OF THE INDUSTRY" SUPPORTER……$1,000(USD)

- Company recognition in the program materials
- Company recognition on the "all sponsor signage" at the event

Global Sales	China Sales	China Program Developer
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