

## FORUM AGENDA

*U.S. Department of Energy and Tsinghua University*  
**International Hydrogen Fuel and Pressure Vessel Forum**  
Tsinghua University Beijing, PRC  
September 27 – 29, 2010

The U.S. Department of Energy (DOE) and Tsinghua University in Beijing co-hosted the International Hydrogen Fuel and Pressure Vessel Forum on September 27 – 29, 2010 in Beijing, China. High pressure vessel experts gathered to share lessons learned from CNG and hydrogen vehicle deployments, and to identify R&D needs to aid the global harmonization of regulations, codes and standards to enable the successful deployment of hydrogen and fuel cell technologies.

### Forum Objectives:

- Address and share data and information on specific technical topics discussed at the workshop in Washington, D.C. including testing and certification of Type 3 and Type 4 tanks, pressure relief device testing and validation, tank inspection, and end-of-life monitoring
- Review test protocols and requirements under specific national and international regulations, codes and standards for on-board hydrogen tanks, including the Society of Automotive Engineers (SAE) J2579 and the United Nations Economic Commission for Europe Global Technical Regulation for hydrogen fueled vehicles
- Establish a conduit to share R&D and operational data on hydrogen, CNG, and blend fuels, and to identify and discuss key global issues in R&D and testing protocols needed to ensure safe use of tanks for hydrogen, compressed natural gas, and blend fuels
- Enhance domestic and international harmonization of regulations, codes and standards for onboard hydrogen, CNG, and blend fuel storage tanks

### Location:

Tsinghua-Foxconn Nanotechnology Research Center ( 纳米科技楼 )

4<sup>th</sup> Floor Conference Room

From the hotel to the conference room is about a three minute walk.

<http://map.tsinghua.edu.cn/tsinghua/>

### Accommodations:

Wen Jin International Hotel ( 文津国际酒店 )

No. 1 East Zhongguancun Road

Tsinghua Scientific & Technological Park

Haidian District, Beijing

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### Contacts:

**PRC Contact:** Dr. Z.Q. Mao, Tsinghua University ([maozq@tsinghua.edu.cn](mailto:maozq@tsinghua.edu.cn))

Dr. Jinyang Zheng, Zhejiang University ([jyzh@zju.edu.cn](mailto:jyzh@zju.edu.cn))

**U.S Contact:** Mr. Antonio Ruiz, U.S. DOE ([antonio.ruiz@ee.doe.gov](mailto:antonio.ruiz@ee.doe.gov))

<b>Monday – September 27, 2010</b>		
8:30	Welcome to Delegates	Professor Z.Q. Mao <b>Tsinghua University and Chair of the China Association for Hydrogen Energy</b>
8:35	Objectives and Expectations of Technical Forum	Professor J. Zheng <b>Zhejiang University</b>
8:45	Keynote: <i>Status and Progress in Research, Development and Demonstration of Hydrogen - Compressed Natural Gas Vehicles in China</i>	Professor Z.Q. Mao <b>Tsinghua University and Chair of the China Association for Hydrogen Energy</b>
9:15	<i>Hydrogen and Fuel Cell Technologies in the U.S. – DOE Overview</i>	Dr. Sunita Satyapal <b>Program Manager for Fuel Cell Technologies, DOE</b>
9:45	Topical Lecture: <i>Research on Natural Gas-Hydrogen Engines</i>	Professor Zuohua Huang <b>Xi'an Jiaotong University</b>
10:15	Questions and Answers, Discussion	
10:25	Break	
10:45	<i>Test Protocol for Hydrogen Storage Systems in SAE J2579 and GTR Requirements for Cycling Testing and Its Effects on Type 3 and 4 Containers</i>	Dr. Chris Sloane <b>Consultant to DOE</b>
11:15	Questions and Answers, Discussion	
11:25	<i>Safety Analysis of Type 4 Tanks in Compressed Natural Gas (CNG) Vehicles</i>	Ms. Min Lei <b>Beijing Special Equipment Inspection and Testing Center (BSEIC)</b>
11:55	Questions and Answers, Discussion	
12:05	Lunch	
13:30	<i>Type 4 Tank Testing, Certification and Field Performance Data</i>	Mr. Joe Wong <b>Powertech</b>
14:00	Questions and Answers, Discussion	
14:10	<i>Pressure Vessels for Hydrogen Vehicles: An Original Equipment Manufacturer (OEM) Perspective</i>	Mr. George Hansen <b>General Motors (GM)</b>
14:40	Questions and Answers, Discussion	
14:50	<i>Development of Larger Diameter High Pressure CNG Cylinder Manufactured by Piercing and Drawing for Natural Gas Vehicle</i>	Mr. Xiakang Ma <b>Zhejiang Jindun Holding Group</b>
15:20	Questions and Answers, Discussion	
15:30	<i>HCNG Engine Testing and HCNG Vehicle Marketing in China</i>	Professor Fanhua Ma <b>Tsinghua University</b>
16:00	Questions and Answers, Discussion	

16:10	Break	
16:30	<i>High-pressure Storage Vessels for Hydrogen, Natural Gas and Hydrogen-Natural Gas Blends</i>	Mr. Frank Lynch <b>Hythane Company LLC</b>
17:00	Questions and Answers, Discussion	
17:10	<i>Bonfire Tests of High Pressure Hydrogen Storage Tanks</i>	Professor J. Zheng <b>Zhejiang University</b>
17:40	Questions and Answers, Discussion	
17:50	Key Issues, R&D and Testing Needs: Discussion and Consensus – Action Items, Wrap-up for Day One	Moderators: Professor J. Zheng <b>Zhejiang University</b> Mr. Antonio Ruiz <b>DOE</b>
18:30	Adjourn Day One	
19:00	Dinner	

<b>Tuesday – September 28, 2010</b>		
8:30	Welcome, Objectives and Expectations of Day Two	Professor J. Zheng <b>Zhejiang University</b>
8:40	Keynote: <i>R&amp;D Needs for Global Technical Regulations for Hydrogen Vehicle Systems</i>	Mr. Nha Nguyen <b>U.S. Department of Transportation</b>
9:10	Questions and Answers, Discussion	
9:20	Topical Lecture: <i>Properties, Behavior and Material Compatibility of Hydrogen, Natural Gas and Blends— Materials Testing and Design Requirements for Hydrogen Components and Tanks</i>	Dr. Jay Keller <b>Sandia National Laboratories</b>
9:50	Questions and Answers, Discussion	
10:00	Break	
10:30	<i>Testing and Certification of Gaseous Storage Tanks for Vehicles: The European Commission (EC) Perspective</i>	Mr. Pietro Moretto <b>Joint Research Centre for the EC</b>
11:00	Questions and Answers, Discussion	
11:10	<i>Tank Manufacturing, Testing, Deployment and Field Performance</i>	Dr. Norm Newhouse <b>Lincoln Composites</b>
11:40	Questions and Answers, Discussion	
11:50	Lunch	
13:30	<i>R&amp;D of Large Stationary Hydrogen/CNG/HCNG Storage Vessels</i>	Professor J. Zheng <b>Zhejiang University</b>
14:00	Questions and Answers, Discussion	
14:10	<i>Tank Manufacturing, Testing, Deployment and Field Performance</i>	Dr. Christian Rasche <b>Dynetek</b>
14:40	Questions and Answers, Discussion	
14:50	<i>Non Destructive Evaluation (NDE) Methods for Certification and Production/Performance Monitoring of Composite Tanks</i>	Mr. J. David McCloseky <b>U.S. Department of Commerce National Institute of Standards and Technology (NIST)</b>
15:20	Questions and Answers, Discussion	
15:30	Break	
16:00	Panel Discussion: Pressure Vessel Requirements for Mobile and Stationary Applications – Key Issues and R&D, Testing and Certification Needs for International Consensus	Moderators: Mr. Antonio Ruiz, <b>DOE</b> Canada China EC Japan Korea U.S.
17:00	Consensus on R&D Priorities, Testing Needs and	Moderators: Professor J.

	Action Items	Zheng <b>Zhejiang University</b> and Mr. Antonio Ruiz <b>DOE</b>
17:30	Closing Remarks	Professor Z.Q. Mao <b>Tsinghua University and</b> <b>Chair of the China</b> <b>Association for Hydrogen</b> <b>Energy</b>
18:00	Adjourn Day Two	

**Wednesday – September 29, 2010**

8:30	Reserved for study tour of hydrogen fueling station (fee: 200RMB (or \$30 U.S.) cash/person) and informal bilateral/multilateral discussions on next steps.	
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