



Hydrogen Opposed-Piston Engine Working Group

Hydrogen Opposed Piston Engine Working Group Formed

Industry Leaders Collaborate to Advance Sustainable Transportation Technology

SAN DIEGO, May 25, 2022 – Several organizations, encompassing companies, research labs, and academia, have formed the Hydrogen Opposed Piston Engine Working Group. The organization is a collaborative forum to advance sustainable transportation technology.

“An opposed piston engine with hydrogen combustion could well provide the best-known thermal efficiency from a reciprocating engine, with the potential to match the in-vehicle efficiency of a hydrogen fuel cell,” said James Turner, Professor of Mechanical Engineering, Clean Combustion Research Center, King Abdullah University of Science and Technology. “If so, it is a valuable potential option for long haul transit in our quest for sustainable transportation.”

The newly formed organization hosts a series of meetings of its members to exchange research results, insights, and ideas.

“The direct injection two-stroke engine could be a very promising and interesting option for hydrogen combustion to achieve zero NO_x because of its advantages of high-power density and inherent much lower NO_x emissions,” said Pierre Duret of DI2S Consulting & Training and former director Powertrain and Sustainable Mobility, IFP School (France). “These two-stroke advantages are even more significant with an opposed-piston engine thanks to its higher power density and efficiency.”

The founding members of the Hydrogen Opposed Piston Engine Working Group include:

Achates Power, San Diego, CA. Created with the mission to build cleaner, more efficient engines, Achates Power has an experienced staff of engineers and scientists working with leading engine manufacturers to bring the opposed piston engine to market. Achates Power is backed by the Oil and Gas Climate Investments and other investors.

Aramco Americas. Aramco Services Company (d/b/a Aramco Americas) is the U.S.-based subsidiary of Aramco, a world leader in integrated energy and chemicals, and has had a presence in the U.S. for more than 60 years. Aramco Americas is a contributor to the U.S. energy sector through research and development, venture fund activities, asset ownership, as well as technology and digital transformation. The company is headquartered in Houston, and maintains offices in New York, Washington D.C., Boston, and Detroit. Aramco Americas is committed to being a positive contributor in the communities where its employees live and work, and to making a difference through outreach that benefits the arts, geosciences, education and the environment.

Bourns College of Engineering – Center for Environmental Research and Technology, University of California, Riverside, Riverside, CA. UC Riverside Bourns College of Engineering, Center for Environmental Research & Technology strives to be a recognized leader in environmental education as it collaborates with industry and government to improve the technical basis for regulation and policy, and to be a creative source of new technology.

Combustion and Propulsion Systems, Chalmers University of Technology, Gothenburg, Sweden. Chalmers University of Technology Combustion and Propulsion Systems uses its expertise in combustion and emissions formation to contribute to a sustainable future by minimizing emissions from combustion engines.

Department of Automotive Engineering, Clemson University, Clemson, SC. Clemson is a leading public research institution in South Carolina. The University's International Center for Automotive Research brings together world class faculty, state-of-the-art facilities, and graduate students to lead basic and translational research with an emphasis on industry relevance. Vehicle Propulsion is one of the three strength areas, pursuing a range of topics focused on advanced IC Engine concepts and powertrain electrification.

DI2S Consulting & Training, Paris, France. DI2S Consulting and Training is run by Pierre Duret, the former Director of Powertrains and Sustainable Mobility at IFP School in Paris. The firm provides consulting services in the field of two-stroke direct injection engines.

Engine Research Center, University of Wisconsin-Madison, Madison, WI. The University of Wisconsin-Madison is a public and prolific research institution. The University's Engine Research Center is dedicated to investigating the fundamental thermo-physical process that control combustion performance and pollutant emissions formed during combustion in internal combustion engines.

ID-Technologies, Fribourg, Switzerland. ID-Technologies is a Swiss engineering company specialized in energy technologies. The core business is the production of renewable fuels and clean, efficient energy conversion technologies.

Indian Institute of Science, Bangalore, India. IISc Bangalore is a public institution of higher learning, research and teaching, consistently ranked every year as the best university in India. The Combustion & Spray Research Laboratory and the Engines & Energy Systems Laboratory in the Department of Mechanical Engineering undertake cutting edge research in the fields of combustion, atomization, plasma ignition using laser-based diagnostics and develop alternate fuel-based technologies, particularly for small engines.

King Abdullah University of Science and Technology, Thuwal, Saudi Arabia. King Abdullah University of Science and Technology advances science and technology through distinctive and collaborative research integrated with graduate education.

Mahle Powertrain, Plymouth, MI. MAHLE Powertrain is a leading global engineering and consultancy services provider, wholly owned by the MAHLE Group, a global Tier 1 supplier to the automotive industry. MAHLE Powertrain specializes in research, development, and application of future powertrain systems.

Marquette University, Milwaukee, WI. Marquette University is a private Jesuit research university in Milwaukee, WI. The University's Opus College of Engineering provides its students strong technical and ethical foundations to lead change to serve the world. The mechanical engineering department at Marquette University has an up-and-coming research program focused on alternative fuels for internal combustion engines with support from the DOE, ARPA-e, and NSF.

Powertrain Control Laboratory, University of Michigan, Ann Arbor, MI. The Powertrain Control Laboratory undertakes leading research in the fields of automation of hydrogen fuel cells, fuel reforming for hydrogen on-demand, and hydrogen storage for hybrid and electrified powertrains with support from U.S. Army's Automotive Research Center, DOE and NSF.

Shell plc, London, England. Shell is a global energy company with operations in more than 70 countries. Shell uses advanced technologies and takes an innovative approach to help build a sustainable energy future.

SuperTurbo Technologies, Inc. SuperTurbo specializes in the design, development, and commercialization of the SuperTurbo mechanically driven turbocharger for on-highway and off-highway commercial vehicles.

For more information, visit <https://www.h-ope-wg.com>.

About the Hydrogen Opposed Piston Engine Working Group

The Hydrogen Opposed Piston Engine Working Group consists of members undertaking research and development in the field of hydrogen combustion in an opposed piston engine. The Working Group has regular virtual meetings where members share and discuss progress, insights, and ideas. For more information visit <https://www.h-ope-wg.com>.

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