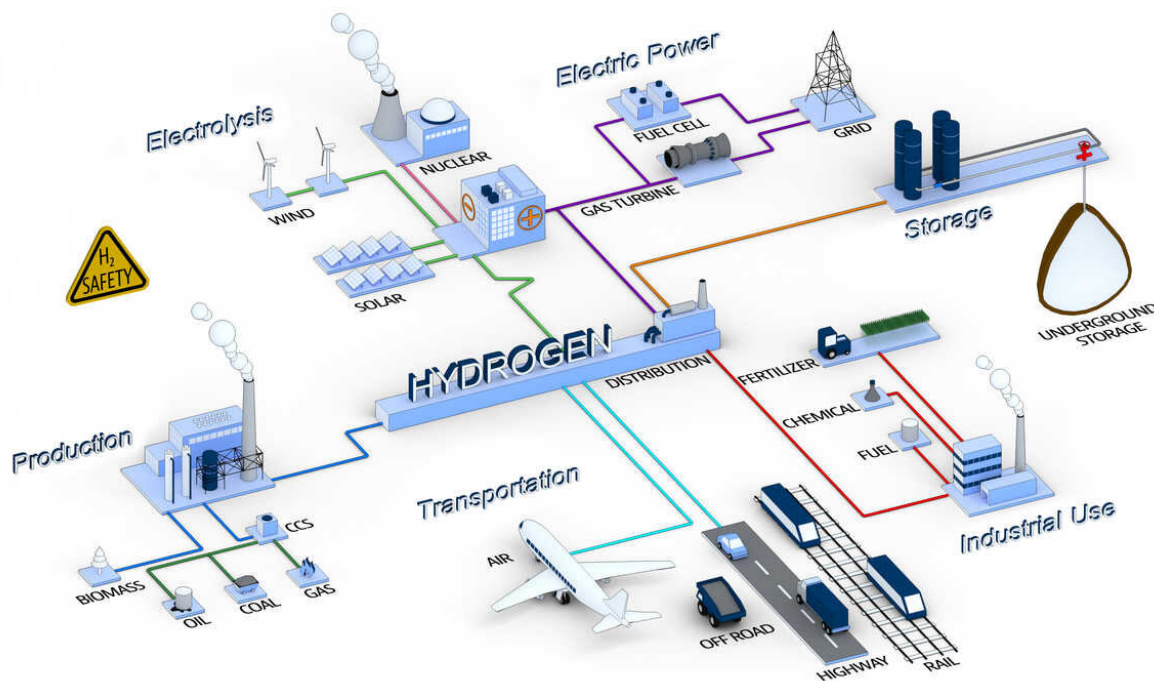


Testing durability of fuel tank valves for hydrogen-powered vehicles

July 13 2022



SwRI's hydrogen energy research spans several industries and applications.
Credit: Southwest Research Institute

Southwest Research Institute is testing the durability of valves on fuel tanks for hydrogen-powered vehicles. Hydrogen is increasingly being considered as an alternative to fossil fuels in the transportation sector. The work is being completed as part of an effort with the National Highway Traffic Safety Administration (NHTSA) to evaluate current

testing standards for pressurized hydrogen tank valves.

In recent years, government and industry demands for hydrogen research have increased as industry searches for alternatives to burning [fossil fuels](#), which contributes to climate change. SwRI is leading several multidisciplinary efforts to evaluate hydrogen as a potential fuel source for automobiles, [power generation](#) and even as a replacement for [natural gas](#) in homes.

"The advances in hydrogen-powered vehicles have led to an increased need for evaluating fuel tank components pressurized with hydrogen gas," said SwRI Research Engineer Jacqueline Manders. "It's necessary for our industry partners to ensure that these tanks and the associated components are safe and reliable prior to use on the road."

Manders led the development of a new [test stand](#) at SwRI that will be used to perform pressure integrity testing on valves and flow components with hydrogen gas. The test stand is designed to achieve pressure as high as 20,000 psi, with temperature control capabilities ranging from -40 to 240 degrees Fahrenheit.

"We're certainly expanding our component test capabilities at SwRI using hydrogen at these pressures and temperatures," Manders said. "Testing with hydrogen is more challenging than with inert gases such as nitrogen or helium. It is imperative to understand the safety hazards associated with hydrogen to design our test stand and develop testing procedures."

The purpose of the current test program is to evaluate and provide feedback on a series of tests for primary closure components on compressed hydrogen storage systems, as specified in a worldwide standard.

"There is also tremendous potential to use the test stand for future integrity testing on components for the hydrogen industry, improving component reliability," Manders said. "With the increased demand for hydrogen research, it's imperative that we evaluate current test procedures and ensure that these products are being qualified to an acceptable standard."

The temperature and pressure extremes are meant to test the hydrogen valves beyond their expected operating range, conservatively qualifying them for use in vehicles in different climates all over the world.

The test stand is now in operation, allowing the Institute to test [hydrogen](#) valves for NHTSA as well as other clients.

More information: For more details, visit [Gas Flow Testing](#) and [Hydrogen Energy Research](#).

Provided by Southwest Research Institute

Citation: Testing durability of fuel tank valves for hydrogen-powered vehicles (2022, July 13) retrieved 10 April 2024 from

<https://techxplore.com/news/2022-07-durability-fuel-tank-valves-hydrogen-powered.html>

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