



Hydrogen and Alternative Fuels Hazards Evaluation

Southwest Research Institute[®] (SwRI[®]) provides the highest quality research associated with alternative fuels, gases and vapors. SwRI's experienced, multidisciplinary technical and support staff members are experienced in construction, machining, electronics, gas analysis and instrumentation. State-of-the-art resources include:

- Fire research facilities (large and small scale)
- Explosive and propellant test ranges
- Vapor flammability and explosion test facilities
- Computer modeling software

Standard Testing

SwRI assisted the U.S. Department of Transportation in development of the Federal Motor Vehicle Safety Standard FMVSS 304, Compressed Natural Gas Fuel Container Integrity, and continues to assist organizations in development of test methods. Staff members perform tests for commercial clients to standards that include:

- FMVSS 304, ISO 11439, NGV-2 – Compressed natural gas fuel container evaluations
- ISO 15869, HGV – Gaseous hydrogen and hydrogen blends (compressed) vehicle fuel tank evaluations
- ISO 16111, Hydrogen absorbed in reversible metal hydride
- GMW 14844, E85 (ethanol/gasoline blend) – Fuel system flame arresting capability
- Liquid hydrogen storage tank evaluations

Explosion Evaluation and Mitigation

SwRI is experienced in assessing the effects of hydrogen, natural gas, propane and other flammable chemical release fires and explosions on various assemblies or structures. Measurements on small-scale samples to complete mockup structures include:

- Dispersion of flammable gases and vapors
- Time to ignition
- Heat release rate
- Blast pressures
- Damage

Research programs can be developed to analyze the hazards associated with the storage and release of small to large quantities of oxidizing chemicals. Ventilation, passive and active fire protection, and ignition prevention techniques can be developed and tested for their effectiveness on an extensive variety of hazards.

Catastrophic failure of a compressed hydrogen cylinder



Infrared view of hydrogen ignition inside an engine compartment



