Liquid Hydrogen Fact Sheet*

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Abstract

This module contains facts related to storing hydrogen as a liquid.

Liquid Hydrogen Fact Sheet

Liquid hydrogen is made possible by cryogenically cooling it to below its boiling point, -253 °C. As a liquid, the same amount of gaseous hydrogen will require much less volume, and therefore is feasible to individual automobile use. A refrigeration system is required to keep the liquid cooled, for if the system temperature rises above hydrogen's critical point (-241 °C), the liquid will become a gas. There must exist a vacuum insulation between the inner and outer walls of liquid hydrogen tank system, for heat cannot travel through a vacuum. There is a tradeoff, however, because the tank must be an open system to prevent overpressure. This will lead directly to heat loss, though minimal.

The relative tank size has a broad range, with small tanks having a volume of 100 L, and large spherical tanks sizing all the way up to 2000 m^3. Refrigeration systems are not a likely feature for every automobile, and open systems may pose a hazard should an accident occur. Cooling hydrogen down to a liquid is a convenient method of storage, however, and its implementation most likely will be limited to large stationary tanks as well as mobile multi-axle trucks.

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