



Liquid Hydrogen Delivery

Hydrogen is most commonly transported and delivered as a liquid when high-volume transport is needed in the absence of pipelines. To liquefy hydrogen it must be cooled to cryogenic temperatures through a liquefaction process. Trucks transporting liquid hydrogen are referred to as liquid tankers.

Liquefaction

Gaseous hydrogen is liquefied by cooling it to below -253°C (-423°F). Once hydrogen is liquefied it can be stored at the liquefaction plant in large insulated tanks. It takes energy to liquefy hydrogen—using today's technology, liquefaction consumes more than 30% of the energy content of the hydrogen and is expensive. In addition, some amount of stored hydrogen will be lost through evaporation, or "boil off" of liquefied hydrogen, especially when using small tanks with large surface-to-volume ratios. Research to improve liquefaction technology, as well as improved economies of scale, could help lower the energy required and the cost.



Liquid Tankers

Currently, for longer distances, hydrogen is transported as a liquid in super-insulated, cryogenic tanker trucks. After liquefaction, the liquid hydrogen is dispensed to delivery trucks and transported to distribution sites where it is vaporized to a high-pressure gaseous product for dispensing.

Over long distances, trucking liquid hydrogen is more economical than trucking gaseous hydrogen because a liquid tanker truck can hold a much larger mass of hydrogen than a gaseous tube trailer can. Challenges with liquid transportation include the potential for boil-off during delivery.



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