



Hydrogen Fueling Station

Marshall Miller, Senior Development Engineer, ITS-Davis
530-752-8758
mmiller@ucdavis.edu

The UC Davis hydrogen fueling station supports the hydrogen enriched natural gas bus and Toyota fuel cell hybrid vehicle demonstration programs, and is located at the Unitrans Maintenance Yard on Garrod Drive in Davis, California.

The station, installed by Air Products and Chemicals, Inc., provides both hydrogen enriched natural gas for refueling transit buses and pure hydrogen for refueling fuel cell vehicles. Both fuels are delivered to vehicles in gaseous form, but the process begins with liquid hydrogen.

Air Products produces liquid hydrogen at a reformer plant in Sacramento and delivers the fuel in tanker trailers to a 1,500-gallon cryogenic storage tank near the refueling station. The liquid hydrogen is converted to a gaseous state and piped to a compressor. Presently, UC Davis is using a temporary, small compressor until a permanent compressor is delivered and installed. The permanent compressor will have a throughput of 300 standard cubic feet per minute (scfm) for hydrogen and will compress the gas to roughly 4,500 pounds per square inch (psi) in buffer storage tanks.

To fuel the hydrogen enriched natural gas buses, compressed hydrogen is mixed with compressed natural gas in a blend unit and then dispensed into the buses at 3,200-3,600 psi. The blended fuel contains 30% hydrogen by volume. Unitrans buses are expected to use about 10,000 scf of fuel every day, of which 3,000 scf is hydrogen. Fueling the hydrogen enriched natural gas buses takes 10 minutes or less per bus.

To refuel light-duty fuel cell vehicles, hydrogen from the buffer storage is piped to a separate location, which features another compressor, additional buffer storage, and a dispenser. The compressor further compresses the hydrogen to 6,250 psi and stores the fuel in buffer storage tanks. Pure hydrogen is then dispensed into vehicles at 5,000 psi. This section of the station can provide enough hydrogen each day to fuel six to eight fuel cell vehicles.

The fueling station is expected to deliver more than 15 kg of hydrogen daily when both programs have all their vehicles operating. This demand is projected to be the highest usage of hydrogen for transportation in the West.

Partners

- Federal Transit Administration
- Toyota
- Caltrans
- Yolo-Solano Air Quality Management District
- Air Products and Chemicals, Inc.
- Madison Government Affairs
- National Hydrogen Association