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DaimlerChrysler

Ford Motor Company

GM

Honda

Hyundai

Nissan

Toyota

Volkswagen

Ballard Power Systems

UTC Fuel Cells

BP

ChevronTexaco

ExxonMobil

Shell Hydrogen

California Environmental

Protection Agency,

Air Resources Board

California Energy Commission

South Coast AQMD

U.S. Department of Energy

U.S. Department of

Transportation

U.S. Environmental

Protection Agency

AC Transit

Air Products and Chemicals

Methanex

Pacific Gas and Electric

Praxair

Proton Energy Systems

Santa Clara VTA

Stuart Energy

SunLine Transit Agency

Ztek

HYDROGEN USE AND SAFETY

The lightest and most common element in the universe, hydrogen has been safely used for decades in industrial applications. Currently, over 9 million tons of hydrogen are produced in the U.S. each year and 3.2 trillion cubic feet are used to make many common products. They include glass, margarine, soap, vitamins, peanut butter, toothpaste and almost all metal products. Hydrogen has been used as a fuel since the 1950s by the National Aeronautics & Space Administration (NASA) in the U.S. space program.

Hydrogen – A Safe, Clean Fuel for Vehicles

Hydrogen has another use – one that can help our nation reduce its consumption of fossil fuels. Hydrogen can be used to power fuel cell vehicles. When combined with oxygen in a fuel cell, hydrogen generates electricity used by the vehicle's clean electric motor to create a smooth, quiet ride – and the only emission from the tailpipe is water vapor.

Hydrogen is an excellent vehicle fuel for many reasons. The U.S. Department of Energy compares hydrogen very favorably to other fuels. Hydrogen is not toxic, poisonous or corrosive. As a result of hydrogen's benign nature, it doesn't harm the environment or public health. If hydrogen were to leak it would disperse into the air almost immediately because it is so light. Contrast that with the effects of oil and gasoline spills, and it's easy to see why hydrogen offers such an exciting future!

Misconceptions About the Past

The fire that destroyed the Hindenburg back in 1937 gave hydrogen a misleading reputation. Hydrogen was used to keep the airship buoyant, but hydrogen did not cause the fire. NASA scientists have found that the Hindenburg's outer shell was coated with a compound similar to what is now used in solid rocket fuel. When the ship docked, an electrical charge ignited the coating. Hydrogen, as a fuel, was not the cause of the tragedy.

Respecting Flammable Fuels

As with any fuel, hydrogen's physical qualities must be respected and understood. The very property that makes all fuels useful also makes them potentially dangerous. So it's important to remember to safely handle energy carriers like gasoline, diesel, natural gas, and hydrogen. Fortunately, we have over 100 years of experience using motor fuels. Today, all fuel production and distribution systems have built-in safety systems. Vehicles do too.

The main rule of thumb in fuel safety is to avoid a leak. Without a leak, there's no opportunity for the fuel to ignite. Fuel cell cars and hydrogen fueling stations are designed to prevent hydrogen from leaking, and with redundant systems to shut down automatically if an accident occurs. The operation of these shut-off safety systems will be verified through testing and real-life experience.

The California Fuel Cell Partnership is collaboration in which several companies and government entities are independent participants. It is not a joint venture, legal partnership or incorporated association.

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Fill 'er Up with Hydrogen

When you pull into a gas station today, you rarely think about safety. We're so used to the experience of refueling our cars, we take certain things for granted -- like not smoking, not using cell phones, and not filling the car with the engine running. In some ways, hydrogen stations will be like traditional gas stations. Many of the same safety precautions will apply.

For instance, to make sure a spark can't cause a fire, no smoking or use of cell phones will be allowed. And built-in safety systems will prevent static electricity from causing any problems.

Fueling Takes Only Minutes

Refueling your hydrogen fuel cell vehicle won't feel all that different. You'll still insert a nozzle into your tank or fueling tube. In this case, though, the nozzle will be securely connected to your tank to prevent hydrogen gas from escaping.

The nozzle will also be designed so hydrogen can't leak during the process of connecting and disconnecting, and the opening of the hydrogen tank will be different enough to make it impossible to accidentally fuel your vehicle with gasoline or natural gas.

Hydrogen Safety Examined

Government and industry have decades of experience designing and conducting safety tests for vehicles and transportation fuels. That same diligence and accumulated experience will be applied to hydrogen fuel cell vehicles with collision, fire and leak tests. In some respects, hydrogen already has been found to be as safe as gasoline and other fuels we commonly use today.

Companies that manufacture hydrogen fuel cell vehicles and build hydrogen stations will use many safety features. These features will be validated through safety tests. Ultimately consumers will play a critical safety role. The more aware you are of the fuels you use, the safer the transition to hydrogen will be. Someday soon, fuel cell vehicles may become as much a part of our lives as our gasoline powered cars.

Driving Your Fuel Cell Car

By using hydrogen in a fuel cell vehicle, you'll get all the benefits of an electric drive system -- no harmful emissions and a smooth, quiet ride. There are already a number of hydrogen fuel cell cars on California roads. In the near future, fuel cell buses will also be used in several California cities.

FOR MORE INFORMATION

If you'd like to learn more about hydrogen fuel cell vehicles or hydrogen safety, visit our website, www.cafcp.org. Other sites of interest include the National Hydrogen Association (www.hydrogenus.com), the National Hydrogen Association's monthly online hydrogen safety newsletter (www.hydrogensafety.info), the National Fire Protection Association (www.nfpa.org) the National Renewable Energy Laboratory (www.nrel.gov/hydrogen/proj_safety.html) and the U.S. Department of Energy (www.eere.energy.gov/hydrogenandfuelcells).

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