



Element One Inc. Introduces New Hydrogen Sensor

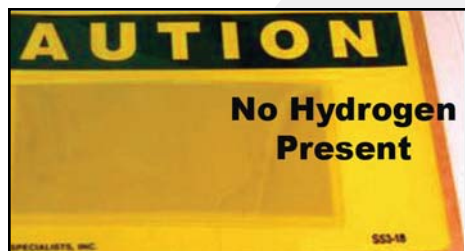
By Susan Leach
Element One, Inc.

One day in the late 1990's, while waiting to catch a flight home from a hydrogen meeting, Bill Hoagland, a former manager for the DOE Hydrogen Program, was reflecting on the meeting discussions on hydrogen safety and sensors. Remembering his days as a pilot, he recalled the inexpensive indicators that would change color if unsafe levels of carbon monoxide were present in the cockpit. "Why can't there be something that simple for hydrogen?" he thought.

Convinced that a simple, low-cost visual indication of leaking hydrogen could have a major impact on alleviating concerns about hydrogen safety, he began investigating the possibilities. This led to the development of a hydrogen gas indicator system that reversibly changes color at concentrations as low as 0.04%-one-hundredth of the lower flammability limit. Hoagland was awarded a patent for the indicator in 2005, and founded Element One, Inc. to develop and market new products based on the technology. The response of the indicator is fast and reliable. The hydrogen indicator can be deposited on virtually any material, or it can be incorporated into nanoparticles for paints or inks.

Since April 2005, Element One has collaborated with the National Renewable Energy Laboratory to fabricate and test a wide range of prototypes using this new technology. Development efforts, led by

veteran researchers David Benson, Element One's Director of R&D and Dr. Rodney Smith, Chief Scientist, have been encouraging. "We tried a number of fabrication techniques and product ideas: decals, placards, stretch wrap, shrink wrap and nanoparticles for pigments for paints and inks, and almost everything we tried gave promising results," Hoagland says. Anticipated applications include equipment,



indicating pigments, a conformable hydrogen indicating wrap overlay, and a Radio Frequency Identification Device (RFID) for Hydrogen Gas Sensors.

Element One is currently seeking development partners and licensees. NASA has indicated an interest in funding a program to test the new sensors this fall.

"Sometimes simple is better," Hoagland says.

For copies of Element One's technical presentations and further information, go to Element One's web site, www.elem1.com.



Element One's Thin Film Indicator. The sample decals are coated with the thin film indicator and show the color change when exposed to hydrogen.

pipng, valves and connectors, storage tanks, vehicles, fuel cells and appliances, protective gear, laboratory use, refueling stations, and enclosed spaces such as residential garages or backup battery enclosures. Additional testing and development work is needed to determine their durability in various operating conditions to ensure the hydrogen indicators meet the requirements of each application.

As a result of product development efforts, Element One has applied for three additional provisional patents: hydrogen

NATIONAL HYDROGEN ASSOCIATION
Renewables to Hydrogen Forum
October 4 & 5, 2006 • Albuquerque, New Mexico
www.hydrogenAssociation.org/renewablesForum

NHANEWS

The *NHA News* is the quarterly newsletter of the National Hydrogen Association. Subscription price is included in member dues.

Editors

Debbi Smith
Brian Schorr
André Cutair

National Hydrogen Association
1800 M Street, N.W., Suite 300
Washington, DC 20036-5802, U.S.A.
Phone: +1.202.223.5547
Fax: +1.202.223.5537
Web: www.HydrogenAssociation.org
Email: info@HydrogenAssociation.org

Managed by Technology Transition Corporation