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AEC Hydrogen Technology

AEC owns a metallurgic formulation which separates hydrogen from water at low cost, requiring no electrical energy or external input, and without utilizing or producing any hazardous waste materials. AEC's process involves chemical reactions between a proprietary metal alloy mix and the liquid solution. These metal alloys are plentiful, stable in cost and produce effective, highly purified hydrogen utilizing a catalytic process.

Background

AEC first acquired the proprietary hydrogen technology outright in September of 2003. In May 2004, all global rights for all market applications were secured. Through research and development, the company has developed a newer, proprietary hydrogen production process.

Since that time, AEC has continued to refine its hydrogen production process. AEC has also been working alongside Astris Energi Inc., under a [joint venture agreement](#). Astris is recognized as a world leader in alkaline fuel cell technology (see <http://www.astrisfuelcell.com/>), and has used AEC's affordable hydrogen to power their 1kw alkaline fuel cell. Due to strict purity and volume requirements of a fuel cell, AEC's technical team has worked in conjunction with a number of recognized independent laboratories to ensure that outputs met acceptable levels for this application. AEC's expectations were surpassed when its hydrogen [successfully powered Astris' 1kw golf cart on Sept 16th, 2003](#).

In May 2004, AEC and Astris entered into a VAR agreement, whereby AEC is now a Value Added Reseller (VAR) for Astris' AFC Power Generator products. The companies believe that this Agreement is the optimal route for their relationship to follow, in that a VAR relationship allows AEC to utilize Astris' alkaline Fuel cell for demonstration and sales purposes while permitting Astris access to AEC's substantial sales and distribution prospects. This VAR arrangement allows AEC to demonstrate and make available a combined fuel cell power pack for sale to major corporate, industrial and energy utility customers, as well as demonstration with U.S. Federal energy and military authorities.

AEC has recently negotiated to purchase the first Powerstack 250 E8 2.4 kw alkaline Fuel Cell from Astris from their pre-commercial production facility in Vlasim, Czech Republic. Delivery of the first unit is due mid-November 2004. This will form the basis of one of the company's demonstration units for various prospective commercial clients.

Currently, AEC has filed the first two patents for its technology, has a third party lab testing to quantify the process, as well as refining the technology into a smaller size for more practical mobile applications.

The Process



At the present time, as patents are pending and due to the risk of proprietary infringement, details of AEC's hydrogen production process are limited to the following:

Upon immersion of AEC's fabricated metal alloy units into the aqueous media, there is an immediate production of aqueous ions and gaseous components, including but not limited to, 99.99% pure hydrogen and oxygen. No source of external energy is introduced or required for such production. The process does not involve electrolysis, or the use of an external source of electrical power of any manner in the actual hydrogen generation process. Removal apparatus for the oxygen are not required for the purity levels to meet required standards for use in alkaline fuel cells and internal combustion engines. The output from the AEC process was certified by Maxxam Analytics, to be 99.9% pure hydrogen on October 7, 2003.

Suitable water sources for the aqueous media includes, but are not limited to: distilled water, natural sea water, artificial sea waters formulated with the addition of mineral salts to distilled or other water, brine, mineral waters, or other natural fresh waters.

Applications

Numerous applications for affordable, on-demand hydrogen exist.

ICE (Internal Combustion Engines)

Specifically, AEC is manufacturing a hydrogen production unit which will combine with a hydrogen reciprocating engine, alternator, battery and inverter in an integrated package that can be located on-site for commercial, industrial or residential electricity customers. At a very low competitive kWh cost for hydrogen, the unit will supply power to the building/home (5-7 kWh requirements) utilizing water as a fuel source and may produce excess power (5 kW) for use in the electrical grid to reduce peak demand requirements. A smaller version of this generator package can be used to recharge/run various devices and machinery, portable generators (back up and primary), along with the battery pack to power an electric car.

Fuel Cells

The Company is currently refining its technology and preparing to start demonstrations of the hydrogen production unit with major fuel cell producers (PEM and Alkaline) and a number of commercial customers. These demonstrations will substantiate the ability to generate hydrogen and electricity at very competitive prices. AEC's consulting technicians have already confirmed the economic model and functionality of this process. The company anticipates that a recognized National Laboratory will be engaged shortly to verify AEC's technology processes.

A Unique Technology

The uniqueness of this technology lies in its ability to overcome several industry obstacles. Current hydrogen production methods are costly and demand a continued reliance on fossil fuels. Storage of hydrogen poses many challenges, including cost and safety. Other alternate forms of hydrogen production typically incur a net deficit of energy - more energy consumed than produced. AEC's hydrogen solution overcomes these barriers, citing the following benefits:

Affordability

1. AEC's hydrogen technology uses only inexpensive yet abundantly

available ingredients.

2. The process itself is extremely cost-efficient. Industrial level cost estimates clearly place AEC ahead of all other known competitors.

Safety

1. AEC's technology produces hydrogen on an as-needed basis, eliminating the need to store hydrogen in a compressed state. This benefit removes an un-necessary cost while avoiding a number of safety issues and negative public concerns about hydrogen.

In addition, there are a number of other key advantages that separate AEC's hydrogen technology from other hydrogen producers. Unlike most of its competitors:

- AEC's process does not generate its hydrogen from fossil fuels, thereby not contributing to a further over-reliance on a non-renewable resource. Methane or natural gas (steam) reformation are examples of this.
- AEC's technology does not require any amount of electric power or external source of energy to operate.
- AEC's process does not utilize harmful or toxic chemicals - all are safe and biocompatible. In fact, the water formed as a by-product of the process is drinkable.

As a result, the company is confident that its technology will have both environmental and cost-competitive advantages in the alternate energy marketplace for the near future.

AEC is currently focused upon the worldwide commercialization of its patent pending hydrogen technology. The company believes this clean technology will have immediate application in the areas of stationary and portable fuel cell applications, back-up power applications, electric-powered automobiles, government and residential and commercial/industrial applications, bulk gas buyers, and for users wishing to gain independence from the existing electricity grid. AEC is moving quickly to complete the necessary engineering refinements.

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