



On-Demand Hydrogen & Heat Generation Systems

The demand for electrification technologies is driving the need for battlefield safe, rugged, and reliable energy sources. General Atomics Electromagnetic Systems' (GA-EMS) on-demand hydrogen and heat generation technology and turnkey fuel cell systems provide significant operational advantages for a range of all-domain applications.

- Point-of-use power to improve mobility, endurance
- Quiet operation for surveillance, reconnaissance missions
- Ease of operation and maintenance
- No mechanical generators or compressors required

Simple operation and refueling process

Safe, reliable operation

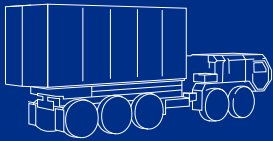
High energy density

Stable, long shelf-life fuel

Modular, scalable designs

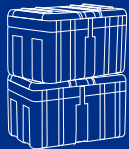
MOBILE HYDROGEN & HEAT

Land and undersea fuel cell vehicles, weather balloons or lighter-than-air systems, with no compressors required.



EXPEDITIONARY ENERGY

Man-portable for in-the-field electronics charging, back-up and auxiliary power.



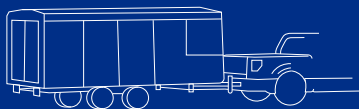
HEAT FOR EQUIPMENT & PERSONNEL

Compact thermal source for cold water, long endurance missions.



HYDROGEN & HEAT FOR EXTREME ENVIRONMENTS

Hydrogen, electric power, and heat for use in cold climate conditions.



Turnkey System Solutions

GA-EMS' on-demand hydrogen and heat generation systems utilizes a proprietary solid aluminum alloy. The systems are modular and scalable, with a simple design and control scheme that allows for the rapid generation of high purity hydrogen. Our unique aluminum alloy reacts with water to generate hydrogen to power the fuel cell. Generated heat can be utilized for a variety of purposes, including heat for equipment and personnel, and melting ice and snow.

Aluminum stores more energy per unit volume than any other viable non-nuclear source. Delivered systems have achieved up to 1.2 kWh of energy and heat per kilogram of aluminum alloy fuel. Additional efficiency improvements are being investigated which could push the energy and heat output to over 2 kWh per kilogram of aluminum alloy fuel.

Hydrogen and heat are generated only when the aluminum alloy fuel is activated by water. The system can be powered on and off at any time to adapt to changing demands for power and to provide greater system efficiency. The aluminum alloy reacts into a non-toxic aluminum hydroxide byproduct which can be disposed of safely.

GA-EMS' unique manufacturing process fabricates aluminum alloy fuel with ultra-high uniformity to ensure maximum energy yield, with a 90-98% aluminum consumption efficiency. The aluminum alloy fuel can be fabricated in convenient bead or molded formats, and when stored properly, does not oxidize or degrade. This provides for a longer storage shelf life and eliminates the logistical transportation concerns typically associated with hazardous compressed or liquified hydrogen fuel.



CONTACT INFORMATION

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