3000 Mile Capacitor Powered Electrical Vehicle

Denny Wheeler
Nampa, ID
United States

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3,000 MILE CAPACITOR POWERED ELECTRICAL VEHICLE

Crystalline Energy Research Corporation (CER) has designed a revolutionary new Capacitor Energy Pack (CEP) for Electrical Vehicles (EVs) using Multi-Layer Ceramic Capacitors (MLCCs). The MLCCs utilize CER's novel and developmental capacitor dielectric materials that have K (Dielectric Constant) factors in excess of 300 hundred million. The CEP would contain 12,000 MLCCs; each MLCC with a 5.5 Farad rating, for a total of 66,000 Farads. Utilizing a charging system that converts 240 Volts AC (VAC) to 336 Volts DC (VDC), the CEP could store 1,000 Kilowatt Hours (KWh). The voltage converting system could be either external or internal to the CEP and the discharging circuitry would be internal. The CEP would be similar in size to a deep cycle marine battery, weigh approximately 175 pounds, and be enclosed in a protective, hardened, crash resistant housing. Our CEP could replace an EV Lithium Ion battery similar to the 2014 Nissan Leaf battery, and a fully charged EV with the CEP could be driven approximately 3,220 miles from San Diego, California to Bangor, Maine with no intermediate recharging required. When the infrastructure of 120/240 VAC outlets at parking places is available nationwide, partial recharging can occur during work, shopping, etc.

With this revolutionary CEP, the range of EVs and hybrids will be increased exponentially above the range of Lithium Ion batteries or Ultra Capacitors. Increasing the CEP size or adding additional CEPs will increase the driving range and vehicle power functionality.

The innovative materials used in the MLCCs of the CEP will provide an operating temperature range of -70°C to +250°C. With the CEP being all solid state, nontoxic/nonhazardous and no electrolytes; the concern of fires or chemical leakage is eliminated.

This CEP with our disruptive and revolutionary MLCC technology will create a transformational shift in electrical energy storage and usage for the following:

1. Electrical and hybrid vehicles
2. All types of combustion powered vehicles
3. Natural gas powered vehicles
4. Photovoltaic cells
5. Wind turbines
6. Military applications requiring increased energy storage

MANUFACTURABILITY

The CEP can easily be manufactured with existing standard ceramic processing equipment, and automated assembly. The automated equipment will assemble, insert, and solder the MLCCs with circuitry into the energy pack housing, followed by encapsulation and quality control.

MARKETABILITY

The CEP will find world-wide consumer and industrial acceptance due to:

1. Greater energy and power storage capability
2. Long term reduction of gasoline and diesel fuel
3. Greenhouse gases
4. Functionality
5. Safety
6. Recharge/discharge cycle life

COST EFFECTIVENESS

This CEP technology will provide an exponential increase in EV energy storage capability, longer usage life, performance, reliability, and a reduced manufacturing cost when compared to Lithium Ion batteries or Super Capacitors. Overall system cost is projected to be equal or lower than current EV battery system technology. This technology will eliminate the problem of hazardous materials disposal inherent with batteries. A very large market demand exists for increasing EV mileage with a higher energy storage system and reduced weight.

Awards

- **2014 Automotive/Transportation Honorable Mention**