



ELECTRIC AUTO CORPORATION

Table 1: Fuel Cell Systems Comparison

	AFC Alkaline Fuel Cell	PEM Polymer Electrolyte Membrane Fuel Cell
Current Density	300-600 mA/cm ²	600 mA/cm ²
Voltage per cell	0.8 - 0.85 V	0.65 - 0.70 V
Power Density + accessories	50 kW / 300 kg 50 kW / 400 kg	50 kW / 200 kg 50 kW / 400 kg
Lifetime operation mode: continuous intermittent	4000 hours 4000 hours (≈ 200,000 miles)	est. 5000 hours Unknown Unknown
Costs per kW + accessories	100 - 150 \$ 200 - 300 \$	500 - 1000 \$ 1000 - 2000 \$
Catalysts Anode Cathode	Noble metals No noble metals	Noble metals Noble metals
Recoverability after misuse	high	low
Maximum fuel impurities Carbon monoxide (CO) Carbon dioxide (CO ₂) Ammonia (NH ₃)	not critical < 100 ppm not critical	< 10 ppm not critical very critical

The EAC Propulsion Fuel Cell (AFC) is less expensive and less complicated than the PEM Fuel Cell. The AFC does not require an air compressor for supplying air to the stack and does not require a humidifier to assure proper moisture content in the membrane. The AFC Fuel Cell is programmed to automatically remove the electrolyte from the stack while the fuel cell is not in operation, thus extending the life of the electrodes. The electrolyte in the PEM fuel cell is immobilized in the membrane and remains in the membrane even while the fuel cell is not in operation, thus leading to degradation of the electrodes and damage due to parasitic currents.