## FCV The Vehicle that will Lead the Way to a Hydrogen-Based Society

The Fuel Cells are comprised of a polymer electrolyte membrane (PEM) formed with catalyst layers which are held on both sides by Gas Diffusion Layers (GDLs). This Membrane Electrode and Gas Diffusion Layer Assembly (MEGA) is sandwiched into a cell by separators. Each cell has a voltage of 1V or less. Therefore a few hundred cells are connected in series increasing the voltage. These cells combined together are called a "FC-stack", and this FC stack is usually what is being referred to when talking about a "Fuel Cell". Unlike a battery the Fuel Cell has no way of storing electricity and can only generate and supply it through the chemical reaction between hydrogen and oxygen, acting as a power generation device.

## **Operating Principles**



## **Fuel Cell**

A fuel cell is an electricity generating device that uses an electrochemical reaction between hydrogen ( $H_2$ ) and oxygen ( $O_2$ ) to generate electricity. When hydrogen and oxygen are supplied to the cell's respective poles (anode and cathode), a fuel cell can continuously generate electricity. When a hydrogen molecule is is supplied to the negative electrode of the fuel cell, it is activated by the catalyst causing electrons and hydrogen ions to separate. From the negative



electrode, the electrons flow outside the stack as electricity, then flow back to the positive electrode. At the positive electrode, the electrons recombine with hydrogen ions and oxygen to form water.

Since a single cell can only generate limited voltage, 370 cells are 'stacked' in series to provide the voltage needed. This FCV stack generates the electrical energy to drive the traction motor of the vehicle and hydrogen is not combusted.

