

> How does a fuel cell work?

Through a silent, efficient electrochemical process.

Here's a quick chemistry lesson:

All fuel cells produce electricity and heat through an electrochemical process using an electrolyte, a cathode and an anode. In the case of Ceramic Fuel Cells' products, electrical energy is produced at high temperatures from oxygen ions leaving the oxygen-rich cathode, passing through the electrolyte and then joining the hydrogen rich anode side.

Ceramic Fuel Cells manufactures Solid Oxide Fuel Cells (SOFC). These use natural gas as a fuel. The natural gas is treated to remove sulphur, then combined with steam to pre-reform other gases, leaving a methane-rich gas. The fuel passes over the anode side, which 'reforms' the methane gas under high temperature, into hydrogen. SOFCs can technically also use other fuels such as LPG and ethanol but unlike other fuel cells, SOFCs do not need pure hydrogen.

On the cathode side, high-temperature oxygen is blown across the cathode. The oxygen ions then travel through the electrolyte membrane and combine with hydrogen on the anode side and create an electric current, water and heat.

When a load (i.e. a light globe) is connected between the anode and cathode, the circuit is completed, allowing the electrons to flow from the anode back to the cathode. This produces electricity, much the same as connecting a light globe to a battery. Most individual fuel cells produce less than one volt of electricity, so they are assembled in layers called 'stacks' to provide a useful voltage. Today, Ceramic Fuel Cells can produce clean, efficient electricity from widely available natural gas - silently.

