

> History of fuel cells

It all started back in the 1800s...

First discovered in 1838

The first positive identification of the fuel cell effect was by Christian Friedrich Schoenbein, a Swiss scientist. His friend Sir William Robert Grove, a Welsh judge, invented and refined the first fuel cell device from 1839 to 1845. Grove's apparatus took in hydrogen and oxygen and produced small amounts of electricity as well as water. A platinum electrode was immersed in nitric acid and a zinc electrode in zinc sulphate. This generated a current of about 12 Amperes at about 1.8 Volts. In 1896, William Jacques, developed the first fuel cell for household use.

At the turn of the century

Walther Nernst was the first to use zirconia as a solid electrolyte. In 1921, Emil Baur constructed the first molten carbonate fuel cell.

By the late 1930s

Francis Thomas Bacon had begun work on alkaline electrolyte fuel cells, and by 1939, had built a cell using nickel gauze electrodes operating under high pressure (3,000 psi). During World War II, Bacon worked on fuel cells for British Royal Navy submarines and in 1958, demonstrated an alkaline cell using a stack of 10-inch diameter electrodes.

Into space in the 1950s-60s

One of the most high profile applications for fuel cells arose from the USA National Aeronautics and Space Administration's (NASA) need for electrical energy in extended missions into space. The NASA alkaline fuel cell uses hydrogen and oxygen as fuel, combining the two chemicals in an electrochemical reaction. This produces three useful by-products in spaceflight: i) electricity to power the spacecraft, ii) water for drinking and cooling equipment and, iii) heat to keep the astronauts from freezing.

In 1962, as research into solid oxide technology began to accelerate in the US and Netherlands, the Allis-Chalmers Manufacturing Company demonstrated a 20-horsepower fuel-cell-powered tractor.

Cleaner energy options arise in the 1980s

As the industrialised world experienced major oil shortages, countries became more concerned about air pollution and sought cleaner electricity generation options. Governments, institutions and commercial organisations began focusing on developing a range of fuel cells for different industrial and domestic applications.

Ceramic Fuel Cells Ltd. was founded in 1992

Today, Ceramic Fuel Cells is continuing to develop Solid Oxide Fuel Cells (SOFC) into the 21st century. It's an exciting time for us, with a number of significant patents and innovative technologies covering the materials, processes, and production of SOFC systems. This includes BlueGen® – offering the world's highest electrical efficiency of any small scale generating technology.