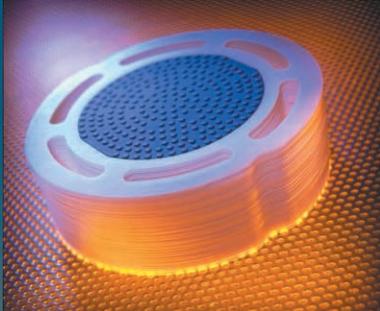




# CERAMIC FUEL CELLS LIMITED

Creating the energy to succeed™

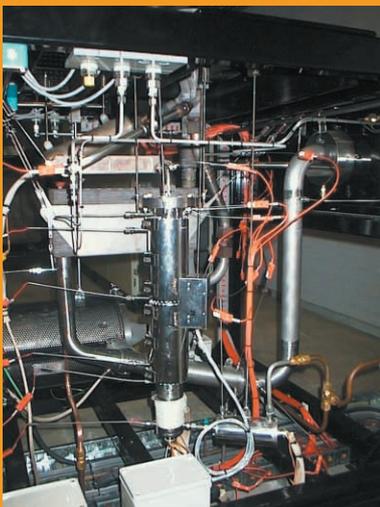
An Australian company **leading the world** in planar solid oxide fuel cell technology



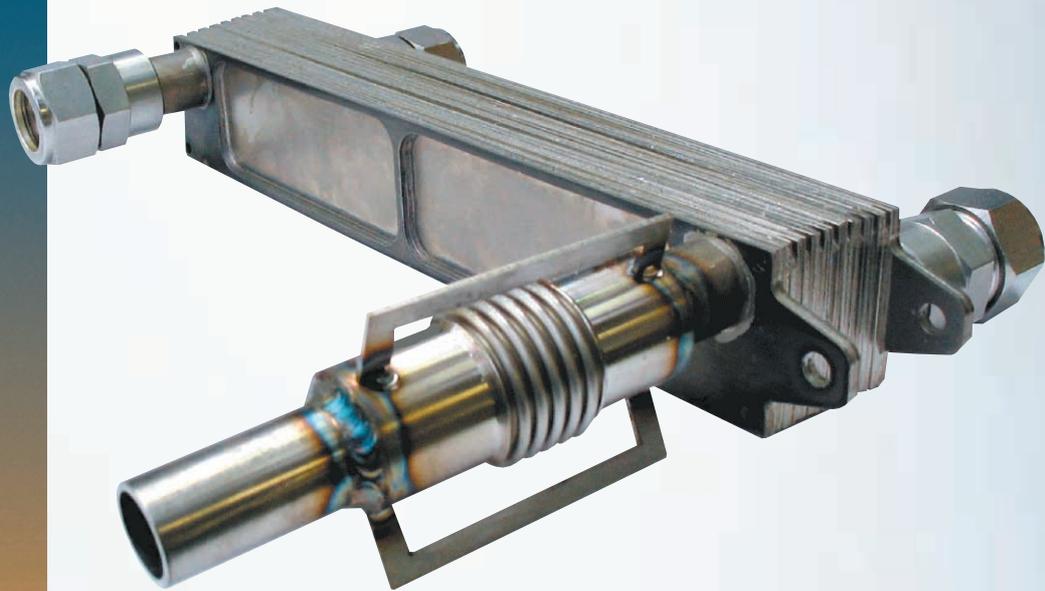
## Balance of Plant

Ceramic Fuel Cells Limited (CFCL) is a leading developer of planar solid oxide fuel cells and related components or Balance of Plant (BoP), which includes heat exchangers, catalytic oxidisers, fuel reformers and pre-reformers, and steam generators.

We can also supply fuel cell test stations and rigs for advanced technical demonstration of solid oxide technology.



## Balance of Plant Components



## Heat Exchangers

CFCL has designed, developed and tested a range of unique plate heat exchangers for operation within fuel cell systems.

### Key features include:

- ▲ High heat transfer rate per unit volume, minimising heat loss
- ▲ Low pressure drop (<500 Pa) – critical for minimising back pressure on the fuel cell stack
- ▲ High temperature operation (1000°C)
- ▲ Robust operational performance with substantial temperature gradients ( $\Delta T = 900^\circ\text{C}$ )
- ▲ No detrimental material emissions to the fuel cell stack
- ▲ Highly reliable manufacturing process – leak free performance
- ▲ Fuel-to-Fuel (pictured), Fuel-to-Air, Air-to-Air options available

[www.cfcl.com.au](http://www.cfcl.com.au)

# Balance of Plant Components

## Heat Exchanger Design



5.5 kW Air-to-Air Heat Exchanger

CFCL heat exchangers can be manufactured to varying customer specifications using our in-house modelling technique, which has been verified against test results. The unique design offers flexible gas porting which simplifies integration into BoP systems.

## Steam Generators

CFCL has developed a range of highly reliable steam generators, capable of producing steam as part of the BoP waste heat recovery



system. The design allows for instantaneous generation of steam to meet the demands of the fuel cell process. The steam generator is able to operate over a wide range of flows and temperatures on both gas and liquid sides. A 420 watt steam generator is illustrated.

## Capability

CFCL has over 80 direct staff, including a cohesive team of engineers and scientists, along with a well developed supplier base operating in solid oxide fuel cell research,



development and production. Combined with our advanced fabrication and extensive testing facilities, CFCL has world leading resources and capabilities for the implementation of solid oxide fuel cell technology.



**CERAMIC FUEL CELLS LIMITED**

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