Company Overview

Guangdong DKEY Energy Technology Co., Ltd. is headquartered in Nanhai District, Foshan City, China, a key development area for the hydrogen energy industry. The company focuses on the development and manufacturing of core technologies for Solid Oxide Fuel Cells (SOFCs) and Solid Oxide Electrolysis Cells (SOECs).

We have developed proprietary Metal- Supported Soild Oxide Fuel Cell（MS-SOFC）technology, featuring high mechanical strength, excellent thermal cycling resistance, and rapid start-up capability. Based on this technology, we are developing advanced cells and stacks in various sizes, including 50 mm square, 100 mm square, and Ø100 mm cells, as well as SOFC stacks ranging from approximately 10 W to 1 kW.

With applications ranging from R&D and laboratory use to distributed power generation and hydrogen energy systems, we are continuously working toward cost reduction and the establishment of scalable mass-production technologies.





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广东东科源能源科技有限公司

Guangdong DKEY Energy Technology Co., Ltd.

PRODUCT CATALOG

1 Metal-Supported SOFC (MS-SOFC)

Successful development of a large-size (Ø100 mm) MS-SOFC with dramatically improved thermal shock resistance against temperature cycling



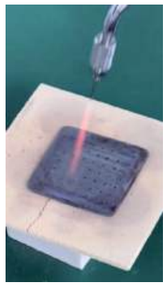
□100 mm Cell
(Cathode side)



Ø100 mm Cell
(Cathode side)

Key Features of This Cell

* Suitable for rapid heating and cooling.
* The metal-supported structure significantly improves thermal shock resistance.
* Dense electrolyte layer with high OCV.
* Excellent durability under repeated thermal cycling.



Water Electrolysis
Burner Flame

Cell Remains Intac



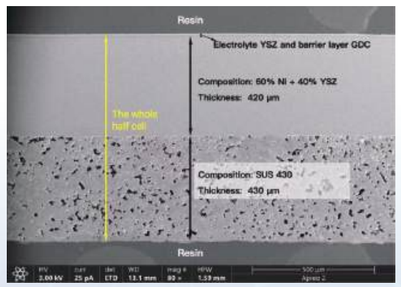
The cell withstands
direct flame heating.



Direct Power Generation
with a Propane Gas Burner

Cell Materials

* Electrolyte: 8YSZ / GDC
* Anode: NiO / 8YSZ
* Cathode: LSC
* Metal Support: SUS430L

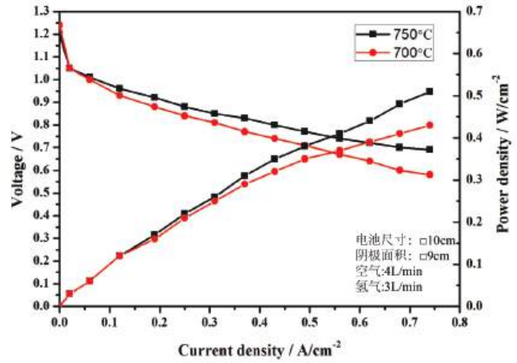


SEM Cross-Section Image

Performance of MS-SOFC Cell

Temperature / °C	700	750
Current Density at 0.7 V / A·cm⁻²	0.55	0.74
OCV / V	1.19	1.18

I–V Characteristics

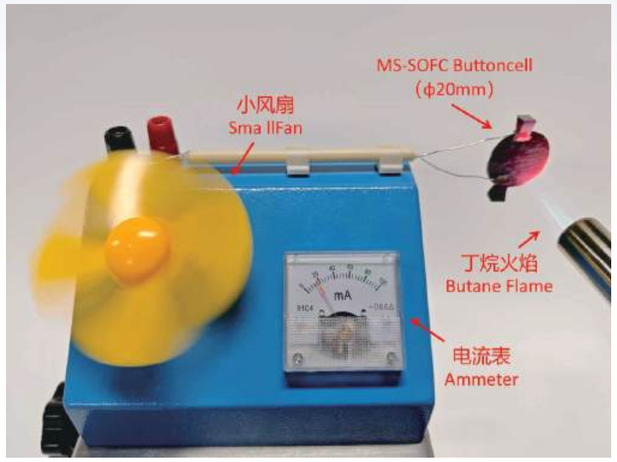


Measured values of the 100 mm square cell

MS-SOFC Cell Specifications

Item	Unit	Value
Electrolyte Thickness	µm	8-13
GDC Layer Thickness	µm	2-3
AnodeThickness	µm	350
Cathode Thickness	µm	20-25
Total Thickness	mm	0.8-0.9
Standard Size	mm	Ø15, Ø20, Ø100, □50, □100 Custom round and square sizes available
Operating Temperature	℃	650-750

2 MS-SOFC Educational Demonstration Device



Technical Features

This device uses a Metal-Supported Solid Oxide Fuel Cell (MS-SOFC). A Ø20 mm cell is rapidly heated using a butane burner to achieve immediate power generation. The generated electricity drives a small fan, visually demonstrating the power generation principle of SOFCs and the excellent thermal shock resistance of MS-SOFCs.

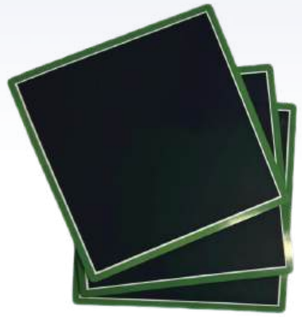
Features
* Visual demonstration of power generation during rapid heating and immediate startup
* Demonstrates both heating by a butane burner and visible power generation
* Repeated heating/cooling and thermal cycling are possible

Main Specifications
* Cell diameter: 20 mm
* Heating method: Direct heating with a butane burner
* Heating time: Approximately 10 seconds
* Demonstration load: Small fan drive; external electrical load connection supported
* Demonstration time: Approximately 1–3 minutes per cycle

Applications
* Experiments and demonstrations in university energy/materials laboratories
* Research institution demonstrations and educational training
* Science education and exhibition demonstrations

Usage and Safety Precautions
* Please use the device in a well-ventilated area.
* Before operation, check that there is no gas leakage at the gas connection.
* Keep the cell and flame at least 30 mm apart.
* After the demonstration, allow the device to cool sufficiently before touching it.
* Butane gas cartridge: Please purchase separately.

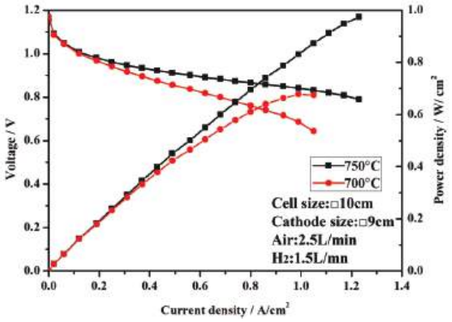
3 Anode-Supported Solid Oxide Fuel Cell (ASC)



Materials
* Electrolyte: 8YSZ
* Barrier Layer: GDC
* Anode: NiO + 8YSZ
* Cathode: LSCF

Features
* High power density, easy to assemble
* High output at low operating temperatures
* Excellent stability and durability
* Customization available

I–V Characteristics



Measured values of the 100 mm square cell

Cell Specifications

Model	ASC-350	ASC-400
Electrolyte Thickness / μm	10±1	10±1
Barrier Layer Thickness / μm	3±1	3±1
Support Layer Thickness / μm	300±10	350±10
Functional Layer Thickness / μm	20±2	20±2
Cathode Thickness / μm	20±2	20±2
Current Density at 0.7 V / A·cm^{-2}	0.56	0.56
Operating Temperature / °C	650-850	650℃~850℃
Standard Size	multicolumn {Square; customized sizes available (MAX. 120 × 120 mm)	

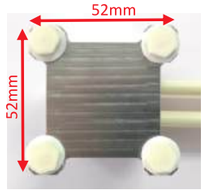
4 Button Cell SOFC Test Fixture

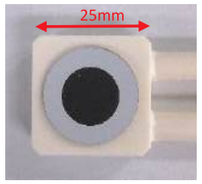
Enables durability evaluation of button cells in a simple and space-saving configuration!

Features

* The cell holder is made entirely of ceramic materials, eliminating concerns about metal contamination of the cell.
* Robust metal mounting housing provides excellent durability and thermal shock resistance, while allowing easy replacement of consumable components.
* Compact design prevents displacement of the cell during installation and incorporates a ceramic spring for applying load.
* Equipped with gas inlet/outlet ports, thermocouple terminals, and electrical terminals.
* Easy installation and replacement of button cells, as well as connection to dedicated electrical equipment.



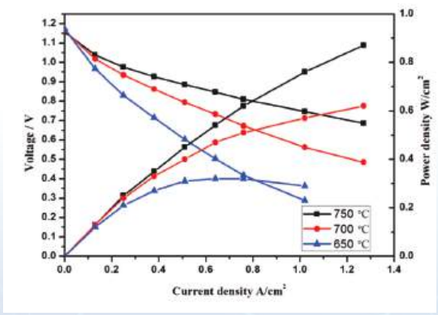






Specifications

Cell Size	15-25 mm (Round of or square)
Holder Dimensions	W52 x D52 x H55mm
Weight	Approx. 500 g
Heat Resistance	Max. 900°C
Gas Flow Rate	Max. 1 L/min
Connections (Both Ends)	Gas inlet/outlet: 6 mm tube insertion type; Voltage lead (φ0.5 mm Pt); Electrical lead (φ0.5 mm Pt); R-type thermocouple (connector included)



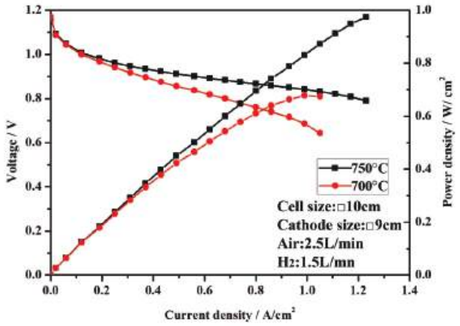
5 High-Temperature Test Fixture & Integrated Evaluation Unit for Large-Size, High-Current SOFC/SOEC Single Cells

To meet the evaluation requirements of large-area, high-current SOFC/SOEC single cells, we have comprehensively redesigned the structure based on conventional all-ceramic test fixtures.



Technical Features

* Compatible with large-size, high-current SOFC/SOEC single cells
* Newly optimized structure suitable for high-temperature environments
* Stable current collection and voltage measurement
* Integrated gas supply and temperature measurement
* Compatible with both SOFC and SOEC operation
* Easy cell replacement and maintenance



Technical Specifications

Basic Specifications of the Test Fixture

Compatible Cell Size	Flat-type, 100–160 mm
Overall Dimensions	155 × 110 × 60 mm
Weight	Approx. 5 kg
Gas Flow Rate	Max. 3.0 NL/min
Operating Temperature	Max. 900°C
Gas Connection	1/4 inch
Temperature Measurement	Pt thermocouple, φ0.5 mm
Current Collection Terminals	Ag current leads (φ2.5 mm × 3)
Cell Sealing Method	Compression sealing using heat-resistant ceramic sealing material and heat-resistant ceramic springs