Prototype

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Metal Supported - Solid Oxide Fuel Cell (MS-SOFC)

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Materials Research & Development Department

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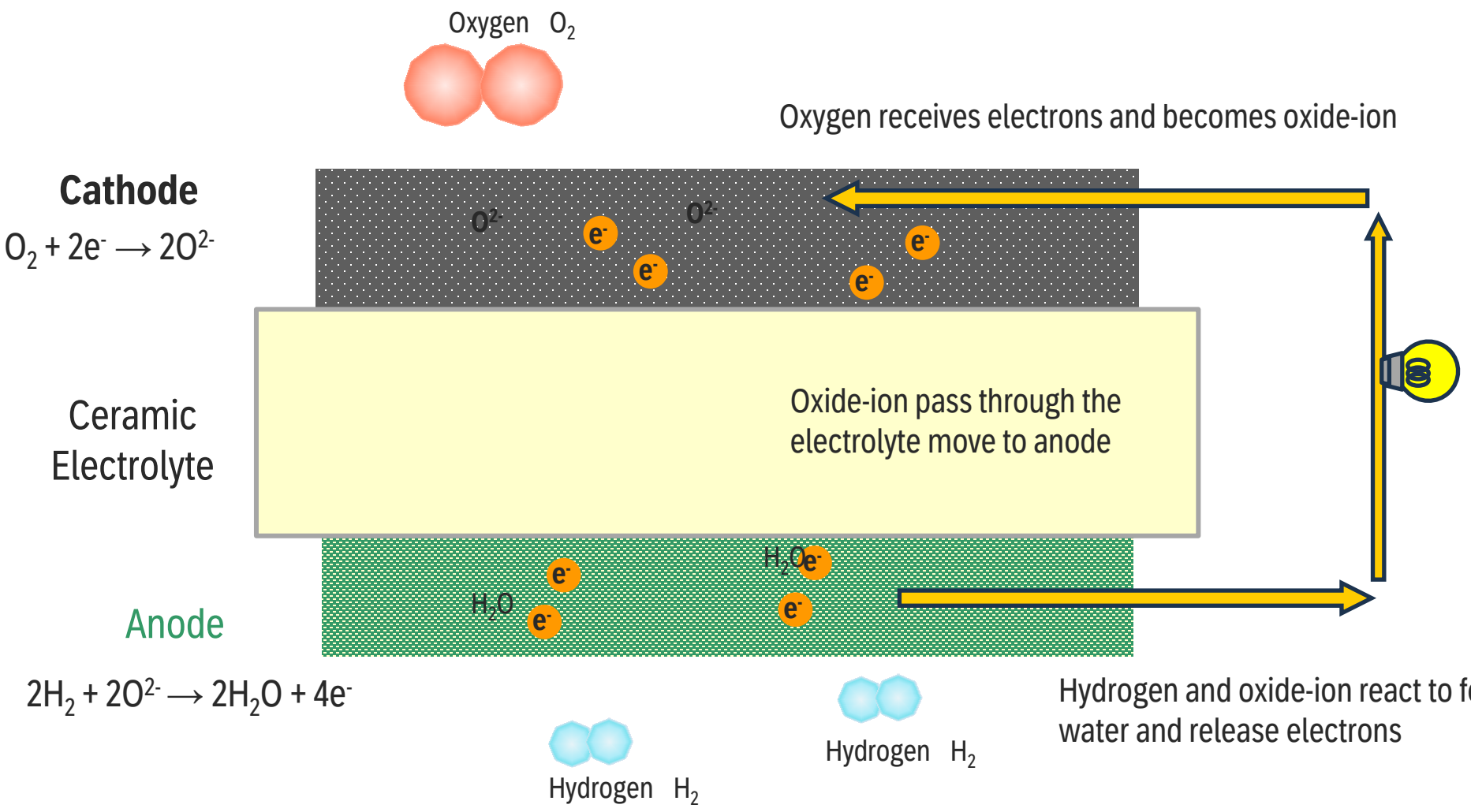
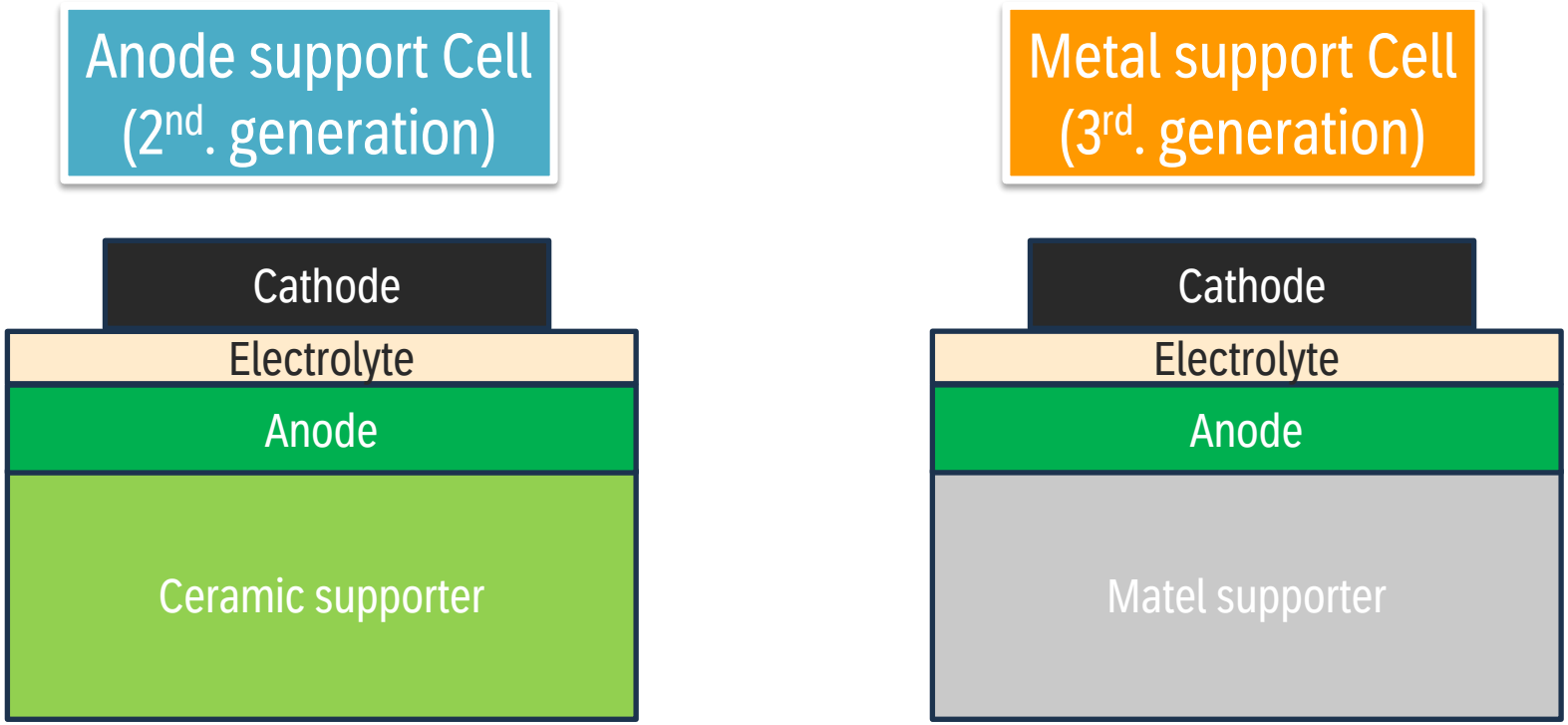
Mechanism of SOFC

Solid **O**xide **F**uel **C**ell ⇨ **SOFC**



Characteristics of MS-SOFC



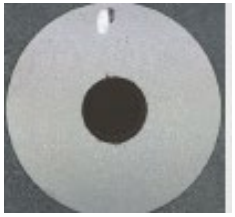
■ **Fast start-up and thermal cycling**

■ **The mechanical properties are significantly improved by supporting with metal (stainless)**

Expected to lower the cost with simple stack design

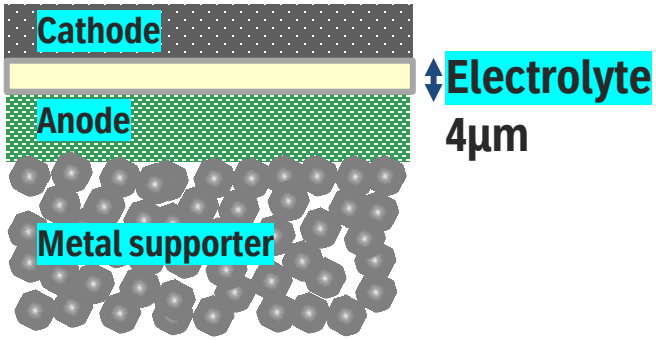
Power generation of Φ30mm coin cell

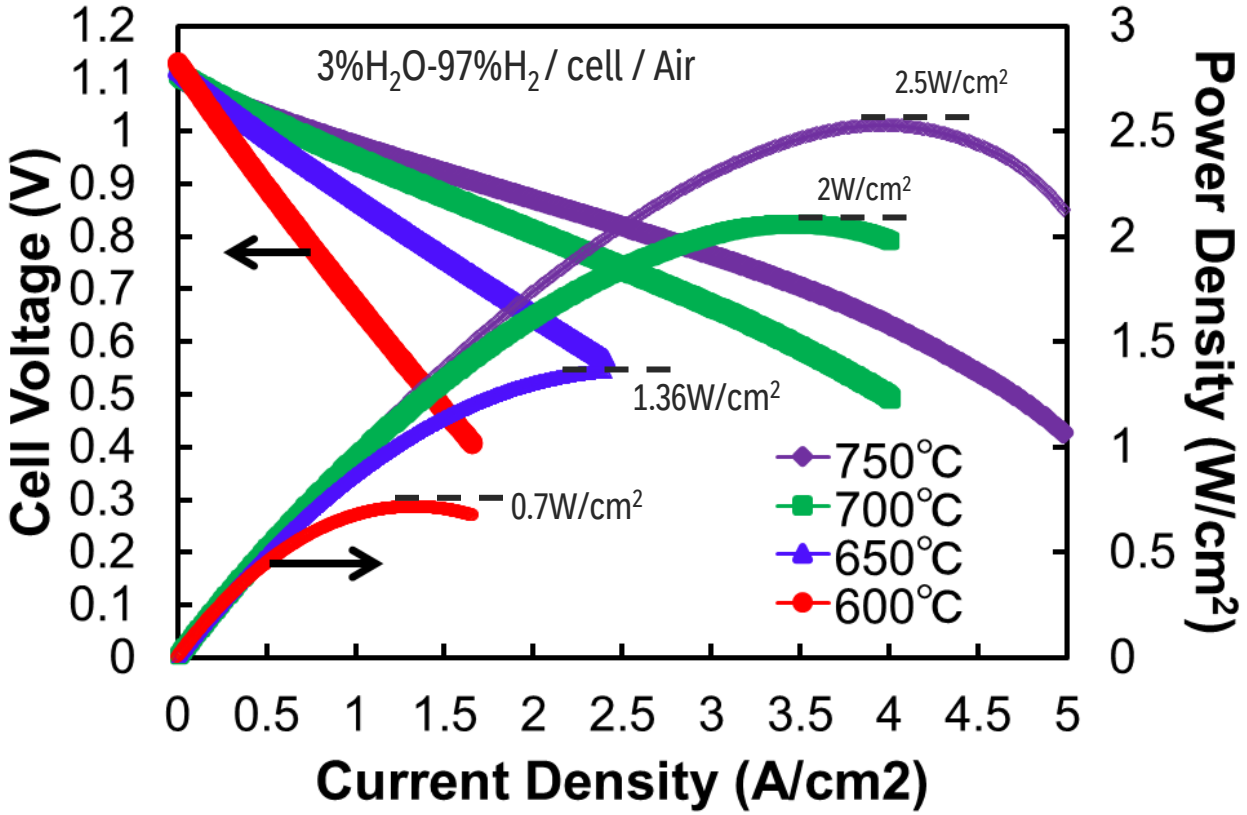
Power generation characteristics are higher than 0.7W/cm² at 600 to 750°C



Φ30mm coin cell

Schematic of cell cross section

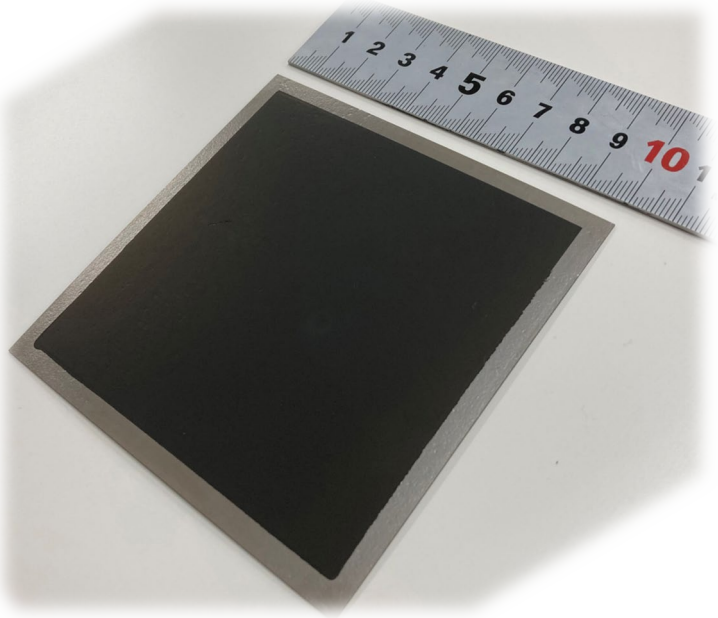




Extremally thin electrolyte layer of **4 μm** ⇒
Lower operation temperature & high performance

Customizable up to a maximum size of □100 mm

Less micro-cracks in electrolyte layer and loss due to gas leak is lower than 1.1%



	600℃	650℃	700℃	750℃
Theoretical OCV(V)	1.163	1.156	1.149	1.142
Measured OCV(V)	1.154	1.146	1.139	1.130
Loss	0.7%	0.9%	0.9%	1.1%

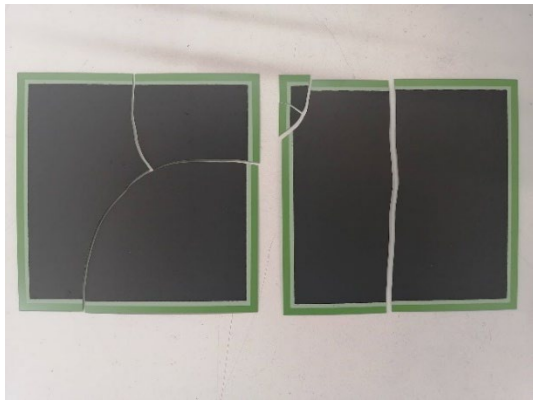
OCV: Open Circuit Voltage

Excellent handling property of MS-SOFC

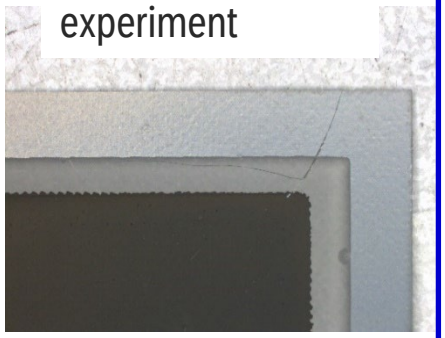
Expectations for low-cost stack design due to high toughness

Anode support Cell (2nd. generation)

Break during assembly of power generation experiment

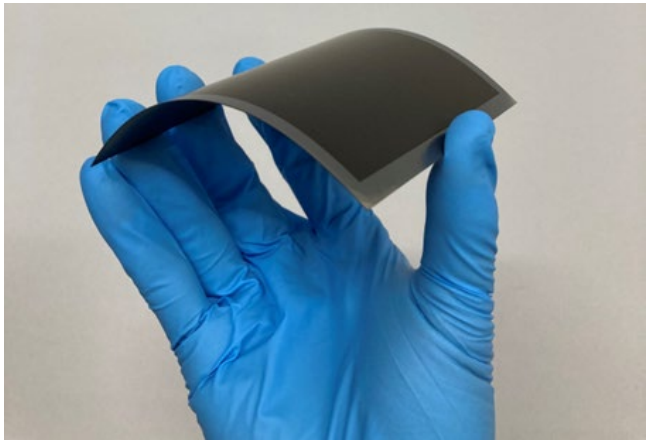


Break during experiment



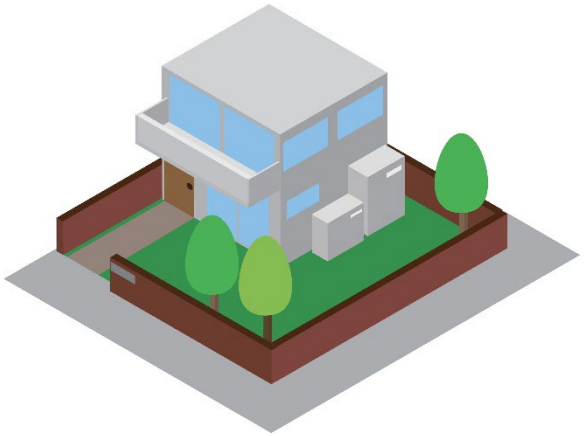
Metal support Cell (3rd. generation)

Flexible
Will not break even when assembled roughly
Never broke during experiment



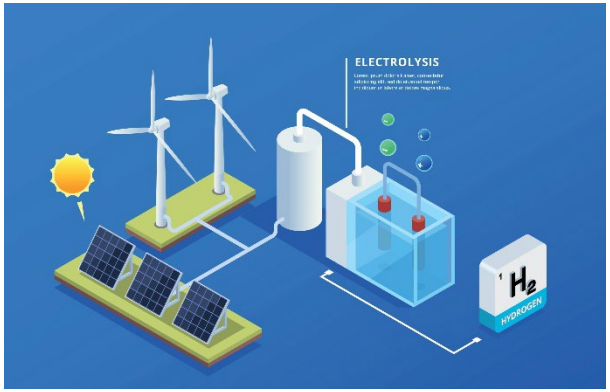
Application

Stationary Power source



Power supply for mobility

Hydrogen production

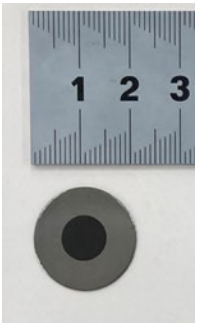


SOEC: **S**olid **O**xide **E**lectrolysis **C**ell

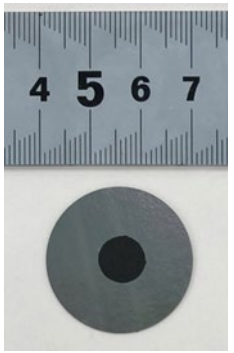
Recruiting co-development partners for various worldwide markets

Size customization for Research Sample

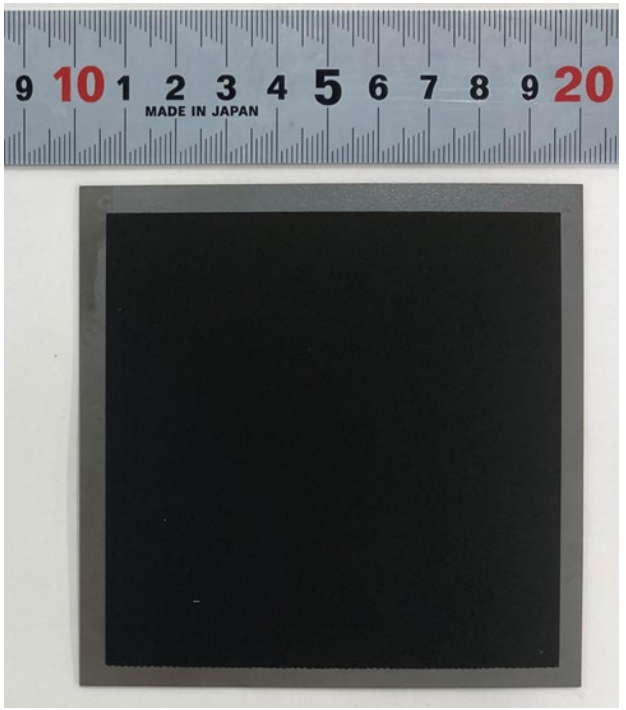
Φ20mm



Φ30mm



□100mm



Research Sample (RS): Size customization and other request

Looking for business partners

Thank you for your attention!