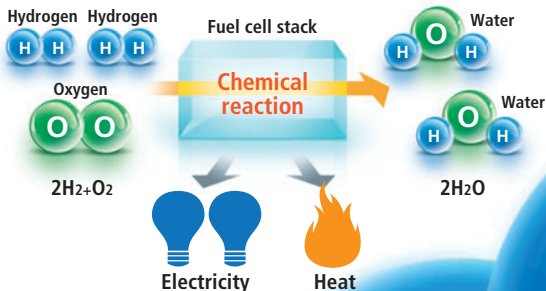


# Feature **2 SHINKA** (Renovating) for the Advent of the Hydrogen Society

## Hydrogen Leak Detection Sensor Developed to Ensure Safety when Using Hydrogen\*

\* Hydrogen is expected to be used for fuel cell vehicles (cars and forklifts), hydrogen-filling stations, residential fuel cells and other applications.



Hydrogen has promise as a clean energy without exhaust gas\* emissions

\* CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, PM

(Internal substrate)



### Hydrogen leak detection sensor

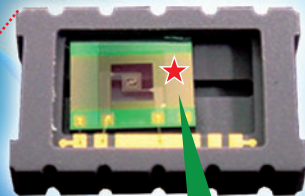
Utilizing advanced microelectromechanical systems (MEMS) processing technology and circuit design technology

(Main unit)



★ Newly developed thermal conductive element

MEMS element that responds sensitively to even slight changes in thermal conduction



Rapid start up with 1 micron thick heater



### Voice of our Developer

Daisuke Ichikawa

New Business Strategy Dept.,  
New Business Advancement Group

### Toward development of non-degrading sensor to maintain FCV safety



Rapid and accurate detection of a hydrogen leak is one of the critical factors for the life of the driver in a fuel cell vehicle (FCV) that runs on hydrogen. Therefore, it is necessary to develop a sensor that is non-degrading at the same time as being highly precise.

NGK SPARK PLUG's hydrogen leak detection sensor is still under development, but we take pride in the facts that it uses a method of detection that is different from those of our competitors and that the durability of the sensor is superior to those of our competitors. First of all, we are aiming to develop a sensor that will be fitted to FCVs for mass production and gain the No. 1 share of the market in this area.

# E nsuring Safety During Use

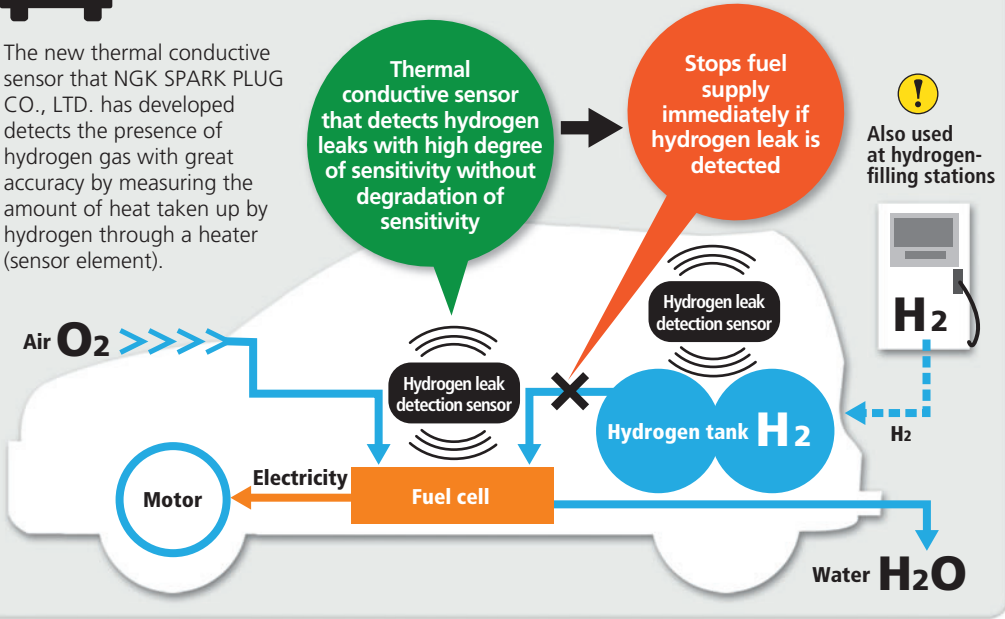
Hydrogen is colorless, transparent and odorless, so a driver would not be able to notice it if it leaked into the air. A highly accurate sensor that can rapidly detect even the slightest leak is essential for safe operation of FCVs.

In the event of a leak into the air...

<p><b>Gasoline</b></p>  <p><b>Noticeable from the smell</b></p>	<p><b>Hydrogen</b></p>  <p><b>Danger of explosion at concentrations of 4 – 75%</b></p> <p><b>Not noticeable even if leaking</b></p>
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# H igh Sensitivity and Rapid Start-up through New Method

The new thermal conductive sensor that NGK SPARK PLUG CO., LTD. has developed detects the presence of hydrogen gas with great accuracy by measuring the amount of heat taken up by hydrogen through a heater (sensor element).



## Taking Part in Development Project for Advanced Electric Vehicles

NGK SPARK PLUG has also widened its approach to the field of electric vehicles (EVs). The Company is gathering and building up technical data leading into research and development on cutting edge EVs through its participation in EV projects at SIM-Drive and FOMM.



The SIM-CEL developed by SIM-Drive

Compact EV under development by FOMM



<http://www.ngkntk.co.jp/english/csr/feature02.html>