



# **SNS COLLEGE OF TECHNOLOGY**

**(An Autonomous Institution)**

**COIMBATORE-35.**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

## **DEPARTMENT OF AUTOMOBILE ENGINEERING**

**COURSE NAME : 19AUT202 - HYBRID ELECTRIC & FUEL CELL VEHICLE**

**II YEAR /III SEMESTER**

**Unit 5- Fuel Cell Components for Automotive Applications**

**Topic : Humidifiers and Cooling plates, Materials for fuel cell components**



1. What is the use of bipolar plate?
2. Why pressure plate is used in fuel cell?
3. What is Gas Diffusion Layer?
4. Why Current conductor is gold coated?
5. What is MEA?

Recap

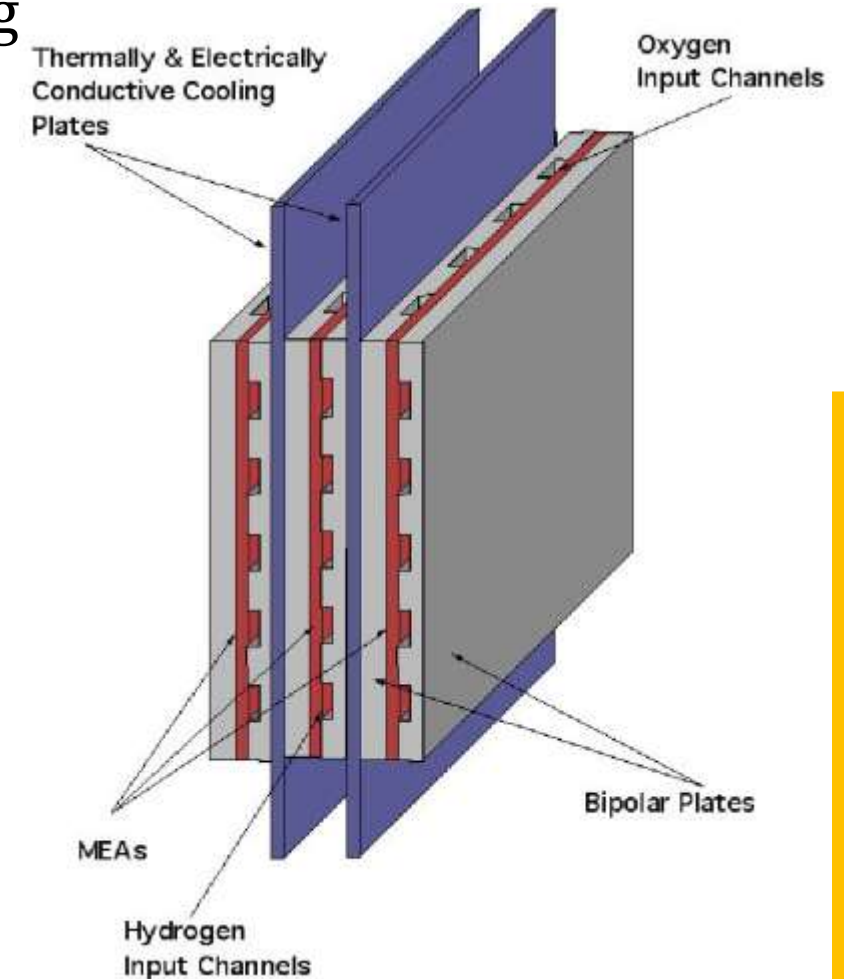




# COOLING PLATE

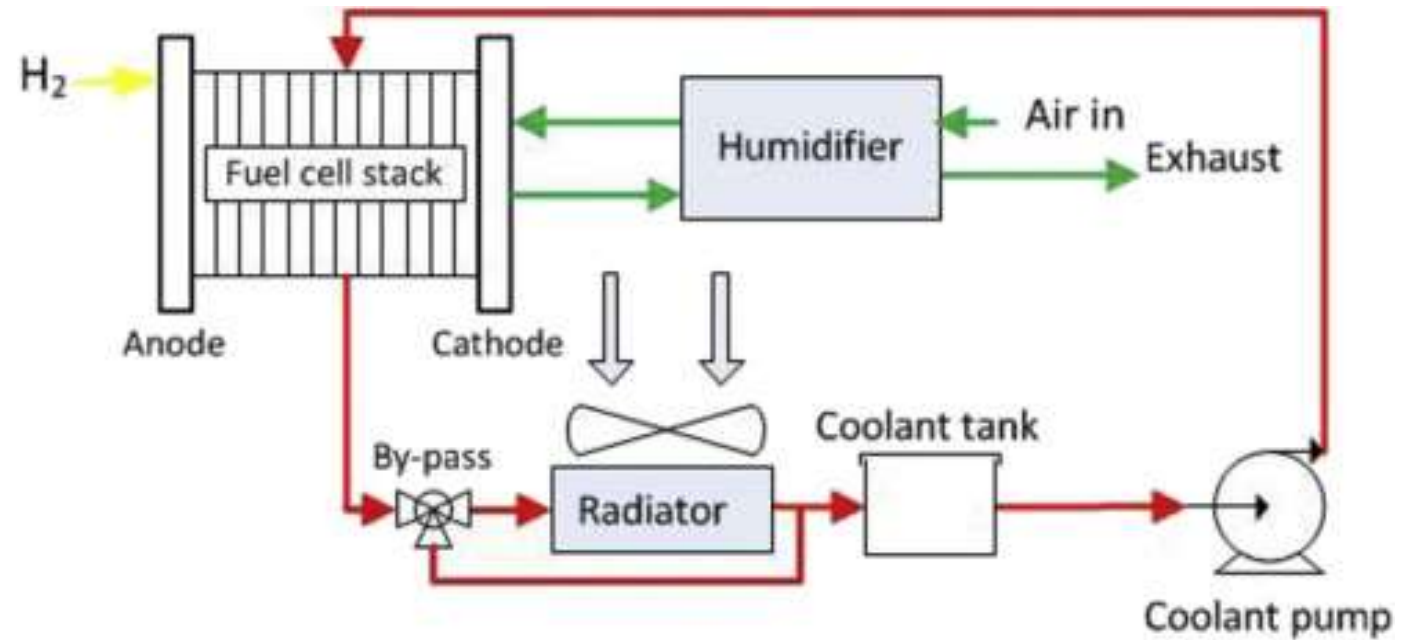


- Using cooling plates is a common solution for cooling fuel cell stacks.
- Thin cooling plates can be manufactured and inserted into the fuel cell.
- The overall system design can be as simple as only one coolant recirculation path.





# HUMIDIFIERS





# HUMIDIFIERS



The humid air could condense to water inside the cell. The water then **limits the flow of air through the reactant flow conduits and isolates the catalyst surface from the reactant gases and the electrolyte.** Air carries oxygen to the active sites in the Membrane Electrode Assembly (MEA).

**Humidifiers provide heat and humidity to the incoming oxidant or hydrogen fuel stream of fuel cells and are critical to overall system performance and reliability.**



# MATERIAL USED

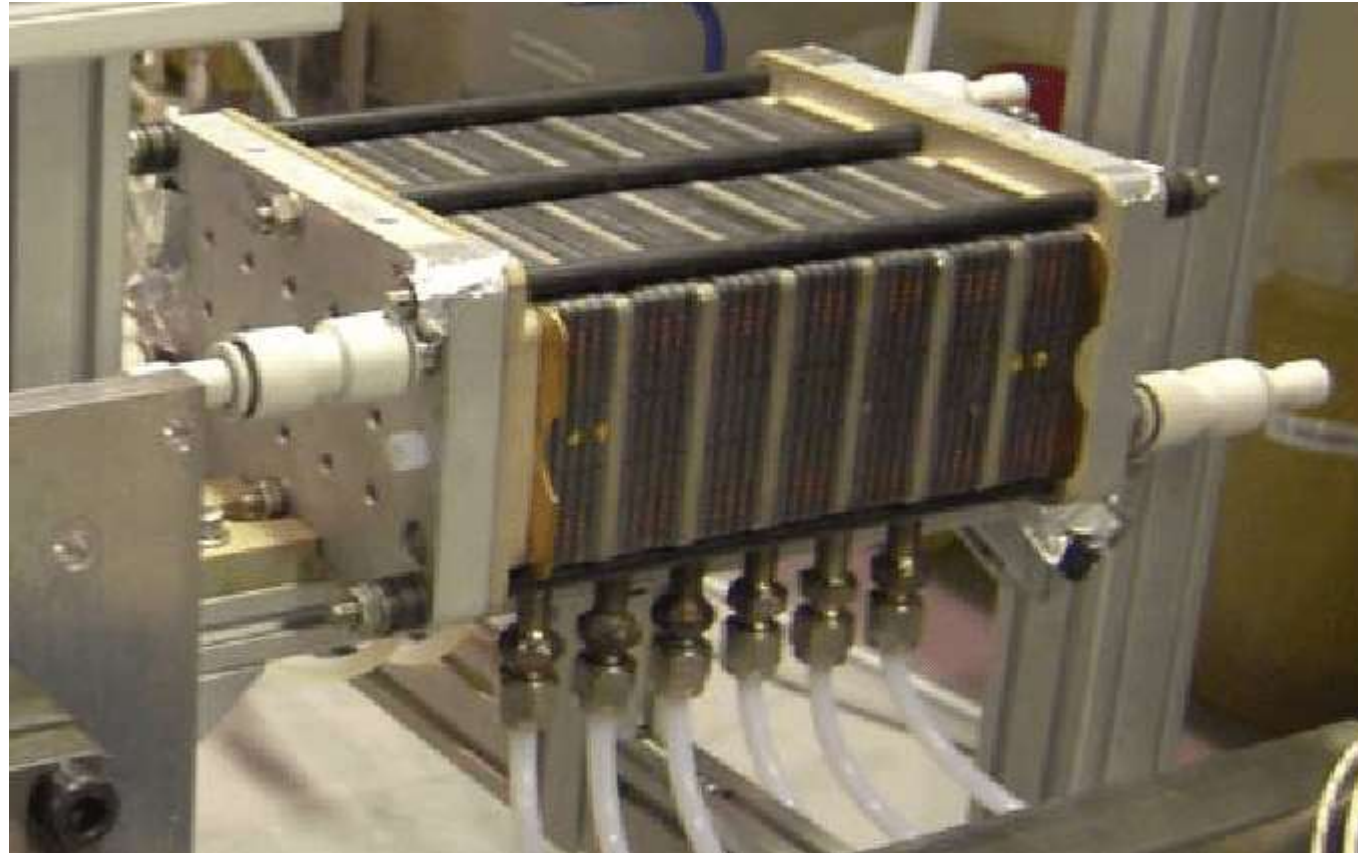


- **Bipolar Plates** – Graphite, Aluminium, Titanium, Stainless Steel
- **Membrane Electrode Assembly**
  - ❖ Gas Diffusion layer – Carbon fibre (Carbon paper, Carbon cloth)
  - ❖ Catalyst – Noble metal like Platinum
  - ❖ Membrane – Polymer Electrolyte
  - ❖ Gasket material - Silicon, EPDM rubber, PTFE (polytetrafluoroethylene)
- **Current collector** - Silver, Gold or Stainless Steel layers or coatings
- **End plate or Compression Plate** - Aluminium, Titanium, and Stainless Steel Alloys



## REFERENCE

- [https://www.fuelcellstore.com/fuel-cell-components/membrane-electrode-assembly#:~:text=A%20typical%20MEA%20is%20composed,Gas%20Diffusi on%20Layers%20\(GDL\).&text=An%20alternative%20version%20of%20a,bot h%20sides%2C%20anode%20and%20cathode.](https://www.fuelcellstore.com/fuel-cell-components/membrane-electrode-assembly#:~:text=A%20typical%20MEA%20is%20composed,Gas%20Diffusi on%20Layers%20(GDL).&text=An%20alternative%20version%20of%20a,bot h%20sides%2C%20anode%20and%20cathode.)



**THANK YOU !!!**