

# FUEL CELL & COMPONENTS

## Fuel Cell Catalyst



Platinum serves as a crucial element in fuel cell technologies. In the context of a polymer electrolyte membrane fuel cell (PEMFC), platinum is typically utilized as a catalyst, supported on carbons, for both the anode and cathode reactions. Pt catalyst is widely used for several electrochemical applications.

## DMFC Catalyst



Catalyst for Direct methanol Fuel cell & reformat hydrogen. Used for fuel cell anode in DMFC system Pt on carbon

- Acta PtRu5VC - 60 VC
- Acta PtRu Black

## Electrolyzer Catalyst



Platinum Black is most commonly used in the cathode of electrolyzer and DMFC.

- Acta Pt100      Surface area: 25 m<sup>2</sup>/g
- Acta IrO      Particle size: > 10 nm

## Gas Diffusion Layer (GDL)



We make customized Gas diffusion layer for PEMFC, HTPEMFC, DMFC, Microbial Fuel Cell and the carbon loading as per customer specification. For carbon paper loading ranging from 0.25 to 1.5 mg/cm. Carbon cloth generally ranging from 3 to 5 mg/cm

### Gas Diffusion Layer Ink (GDLI)



For the preparation of Micro porous layer need carbon ink which consists of carbon powder mixed with PTFE or PVDF or Nafion binder. For researcher and academic institution it is difficult to make ink with small quantity and PTFE dispersion also not available in smaller volume. The ready to use ink will save time, energy and money.

### Gas Diffusion Electrode (GDE)



GDE used for electrochemical applications as for making anode and cathode of various fuel cells like Polymer electrolyte membrane fuel cell, high temperature PEM, Alkaline fuel cell and Phosphoric acid fuel cell etc., Gas diffusion layer with Pt loading ranging from 0.25mg to 1.0 mg/cm with various percentage of Pt/C (20 to 60%).Our standard loading for the GDE is 0.5mg and 0.25mg/cm. Available in both carbon cloth and carbon paper based GDE. GDE also Possible to supply as per customer dimension with specific loading of catalys

### Catalyst Coated Membrane (CCM)



The catalyst which is coated directly on the membrane to improve the contact between membrane and catalyst. CCM improves the overall performance of the fuel cell. Three layer membrane electrode assembly with catalyst loading ranging from 0.1 to 0.5 mg/cm

### Membrane Electrode Assembly



Membrane electrode assembly is core components of fuel cell stack. Atypical MEA is composed of a Polymer Electrolyte Membrane (PEM), two catalyst layers, and two Gas Diffusion Layer(GDL).A MEA with this configuration is known as a 5 - layer MEA.If gasket is added then it is seven layer MEA. MEA is also possible as per customer dimension and specification

### Electrocatalyst Ink



Ready to use for the preparation of Gas Diffusion Electrode and Catalyst Coated Membrane. This electrocatalyst Ink contains nafion binder.

- Save time and energy and equality dispensation.
- Ink is suitable for spray as well as for brush coating.

### Fuel Cell Hardware



The flow field design is parallel and single serpentine for cathode and anode respectively. Flow field plate can be customized as per customer needs.

End plate with Al alloy or Ss316 and current collector without gold coating. Gold coating is optional. The other necessary hardware are the part of the assembly. Additional accessory are temperature controller with thermocouple and Torque wrench.

### Electrolyzer Hardware



Laboratory experimental setup for production of hydrogen and oxygen. The unit cell assembly consist of grooved titanium plate as a current collector cum water flow distributor

PEMWE: Titanium plate

Pt plating is optional.

Alkaline electrolyzer: Nickel or Ss316 grooved plate.

### PEM Fuel Cell Stack



Stack capacity ranging from 100 to 1000 watts (water cooled). Open air cathode fuel cell stack: 10 watts to 500watts. Stack for portable electronics applications up to 100 watts.

## EDUSTAK JUNIOR

FCSU-32



Built your own fuel cell stack with no tools uses unique refillable HYDROSTIK PRO metal hydride cartridges as fuel supply.

## Fuel Cell Car

FCJJ-11



Built your own working fuel cell car, harnessing the power of hydrogen and solar energy

## Hydro car

FCJJ-20



Hydro car demonstrates a complete clean-energy system with solar to hydrogen power generati

## Solar Hydrogen

FCJJ-16



Invert your own clean energy application using fuel cells and the power of solar energy

## Wind to Hydrogen

FCJJ-56



Produce electricity and hydrogen with a wind turbine combined with a small electric motor and a reversible fuel cell.

## Renewable Energy Kit



Complete and modular set conveying the key principles of solar, wind energy, electrolysis and fuel cell technology.

## Horizon Energy Monitor



The idea accessory to connect all our kits to a computer and visualise live effects of experimentation on Interactive graphs

## Salt Water Fuel Cell



Demonstrate a cutting edge fuel cell concept generate energy from a salt water electrolyte and magnesium plates.

## Ethanol Fuel Cell



Discover the workings of a direct ethanol fuel cell and the principles behind the conversion of ethanol into electrical energy

### Thermal Power



Generate electricity using nothing more than a combination of hot and cold water and a special conversion cell.

### Super Capacitor



Discover the extraordinary power potential of the super capacitor with a hand crank and charge level indicator.

### Horizon Energy Box



The complete range of horizon experiment kits in one classroom storable box! Harness solar, wind and kinetic energy, experiment with super capacitor energy storage; compare fuel cells and much more.

### Wind Energy Kit



Built a miniature power generation system that converts wind into electrical energy.

### Bio - Energy Kit



Explore a working demonstration of the conversion of ethanol to electrical energy.

## HYDROFILL PRO



The world's only on-demand hydrogen gas supply, idea for classroom use and storage. The unit safety and automatically refills metal hybrid cartridges (HYDROSTIK PRO).

## HYDROSTIK PRO



Convenient and safe hydrogen storage to fuel your hydrogen powered devices and experiments.

## ELECTRIC MOBILITY



Experiment with solar power, kinetic energy, a super capacitor and four different kinds of fuel cell.

## MICRO-FUEL CELL



Explore the future of energy storage with Horizon's micro fuel cell kit.

## H-RACER 2.0



Experience the automotive technology of the future by building and driving your own hydrogen fuel cell car

## EDUSTAK PRO

FCSU-33



Create your own hydrogen powered devices with 20W fuel stack technology.

## H-CELL 2.0

FCJJ-21



Create your own fully integrated hybrid hydrogen-electric application using metal hydride storage technology.

## FUEL CELL DEVELOPER KIT (FCDK)

FCDK-1.5/12/30



Start experimenting with an open-source fuel cell system that lets you create your own hydrogen powered devices.

## H-200 PEM FUEL CELL 200W

FCS-C200



## H-300 PEM FUEL CELL 300W

FCS-C300



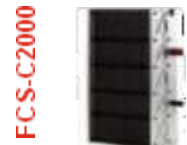
H-500 PEM  
FUEL CELL 500W



H-1000 PEM  
FUEL CELL 1000W



H-2000 PEM  
FUEL CELL 2000W



H-3000 PEM  
FUEL CELL 3000W



H-5000 PEM  
FUEL CELL 5000W



## STANDARD AEROPAK SYSTEM 200W CONTINUOUS

APK01-01



### High performance fuel cell

AEROPAK is an ultra-light power system enabled by fuel cell and integrated hydrogen-on-demand System and chemical fuel tank.

## AEROSTAKS 200W-1000W

A - 200 PEM

FUEL CELL 200 W



AST01-01

World's lightest, highest power density stacks

Up to 8 times lighter and smaller than our H-SERIES fuel cells, Aerostaks are used in specialty applications' where weight is a critical factor.

A - 500 PEM

FUEL CELL 500 W



AST03-01

A - 1000 PEM

FUEL CELL 1000 W



VL-30/VL-40

H-1000 XP PEM  
FUEL CELL 1000W

FCS-1000XP



H-SERIES 12W-5kW PEM STACKS  
Simple, reliable, compact, easy to integrate  
H-12 PEM

FCS-B12



H-20 PEM  
FUEL CELL 20W

FCS-B20



H-30 PEM  
FUEL CELL 30W

FCS-B30



H-100 PEM  
FUEL CELL 100W

FCS-C100



XP-SERIES STACKS H-500 XP PEM  
FUEL CELL 500W

FCS-500XP



HYDROFILL & HYDROSTIK

FCH-010



Safe, portable hydrogen & on demand refills World's only consumer grade desktop electrolyzer, automatically refills HYDROSTIK metal hydrides.

HYMERA

HYM12(24)-150



Efficient, long duration power 150W fuel cell power supply compatible with 7.5kWh LINDE GENIE industrial bottles, ideal for construction, security, marine and hybrid solar industrial power supply.

INTEGRATED FUEL CELL SYSTEM

T - SERIES



Remotely accessible for real - time control & monitoring. Optional extended - run / auxiliary fuel tank cabinets. Quiet Operation, Clean Power. Lower Energy Cost, Lower Maintenance. No carbon monoxide, No or Sox emissions. Can be hybridized with solar or wind power.

## 30KW/40KW LIQUID-COOLED FUEL CELL



The VL-30/40 Fuel Cell from Horizon delivers high power density with simple balance of plant requirements. The VL-30/40 be widely used in cars, buses, passengers' cars and logistics vehicles. The VL-30/40 is also suitable for stationary power solution.

## METHANOL REFORMER FUEL CELL SYSTEM



MFC series offers extremely long endurance power in the field compared to others alternatives. It is as quiet as a whisper and has minimal carbon emissions. Its integrated fuel cell uses an electrochemical process to generate electricity with few moving parts. The MFC series is fuelled by a safe and economical methanol-water blend.

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