



## SPECIALTY CARBON SOLUTIONS FOR FUEL CELLS

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**TIMREX®**  
Graphite

**ENSACO®**  
Carbon  
Black

**C-SPERSE™**  
Carbon  
Dispersions



IMERYS SPECIALTY CARBON POWDERS  
FOR FUEL CELLS

Carbon based materials are an essential element of the key components of fuel cells. Imerys Graphite & Carbon has a broad portfolio of high purity graphite powders, carbon based dispersions and conductive carbon blacks well suited for a variety of fuel cell technologies.

Imerys’ carbon based powders and dispersions, are used in gas diffusion layers, catalyst supports and as coatings for fuel cell systems using metal bipolar plates.

Graphite powders and conductive carbon blacks are ideal for the **polymer bipolar plates** of proton-exchange membrane fuel cells (PEMFC), also known as polymer electrolyte membrane fuel cells.

Finally, our graphite powders are also used as pore formers in solid oxide fuel cell components.

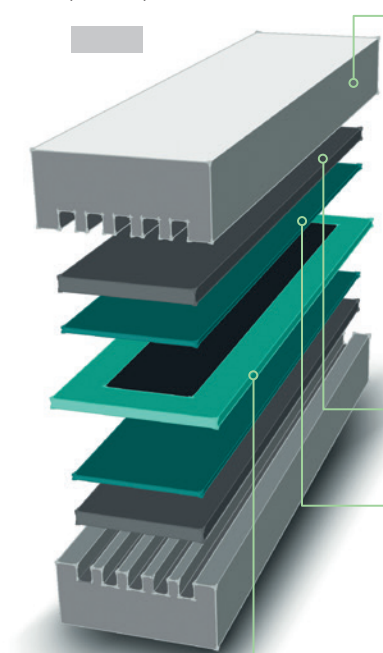
Our team of experts works closely with our customers to identify the ideal solution for their specific technological needs.

| APPLICATION  | END USE REQUIREMENT           | IMERYS SOLUTIONS ARE FOUND IN                                   |
|--|-------------------------------|---|
| Stationary power generation (backup power sources) | ✔ Durability                  | ✔ Bipolar plates<br>✔ Gas diffusion layer<br>✔ Catalyst support |
| Passenger cars                                     | ✔ Performance                 | ✔ Gas diffusion layer<br>✔ Catalyst support<br>✔ Bipolar plates |
| Heavy duty (trucks, buses)                         | ✔ Durability<br>✔ Performance | ✔ Bipolar plates<br>✔ Gas diffusion layer<br>✔ Catalyst support |



## PEM FUEL CELL

Negative Electrode  
(Anode)



Positive Electrode  
(Cathode)

### COMPONENT

### OUR PRODUCTS

### VALUE

#### BIPOLAR PLATES

- ✓ TIMREX® KS & SFG (KS150, KS75, KS5-75TT, SFG150, SFG75) Primary Synthetic Graphites
- ✓ ENSACO® 250G, 260G Conductive Carbon Black
- ✓ TIMREX® C-THERM™ High Aspect Ratio Graphite

- ✓ Electrical conductivity
- ✓ Thermal conductivity
- ✓ Mechanical stability
- ✓ Processability

#### GAS DIFFUSION LAYER

- ✓ C-SPERSE™ Water Based Carbon Black & Graphite Dispersions

- ✓ Control of porosity and hydrophobicity for optimized transport of gases and liquids
- ✓ Electrical and thermal conductivity

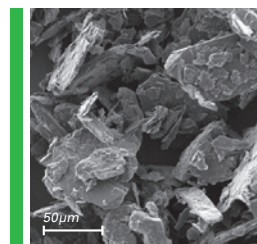
#### MICROPOROUS LAYER

- ✓ ENSACO® 250G, C-ENERGY™ C65T Conductive Carbon Black

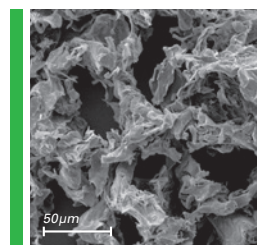
#### CATALYST SUPPORT

- ✓ ENSACO® 350G High Surface Area Conductive Carbon Black

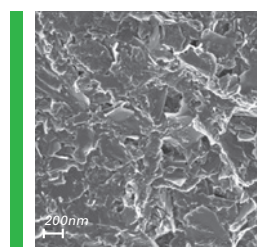
- ✓ High specific surface area and mesoporosity for good catalyst activity, enabling reduced precious catalyst dosage
- ✓ Can be burned off to recycle the precious catalyst at end of life



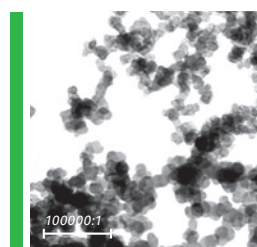
TIMREX® KS75  
Primary Synthetic Graphite



TIMREX® C-THERM™  
High Aspect Ratio Graphite



C-SPERSE™ Dried Water  
Based Graphite Dispersion



ENSACO® 250G  
Carbon Black

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