

- Alkaline Metal-Air Systems
- Saline Systems

GENERAL DESIGN OF ALUPOWER GAS DIFFUSION ELECTRODES

The air cathode has four separate plies. There are two reactive "carbon" layers, a current collector and a microporous hydrophobic film. The current collector is placed between the two carbon layers, and the hydrophobic film is on the outside surface which becomes the "air side."

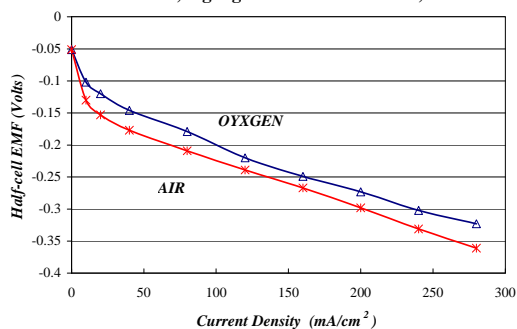
The reactive carbon layer consists of carbon-fiber nonwoven which has been impregnated with a mixture of carbon black and other additives. These two plies of electrically conductive reinforcing fibers provide a low cost electrode that meets extreme environmental demands while maintaining its excellent performance.

The *Alupower* system for fabricating laminated air cathodes has been used to make other battery components, supercapacitors and electrodes for electrosynthesis applications. Gas diffusion electrodes for hydrogen-oxygen fuel cells and rechargeable air cathodes are examples of products which can be made by this process. These modifications can be made by changing one or more of the individual cathode layers.

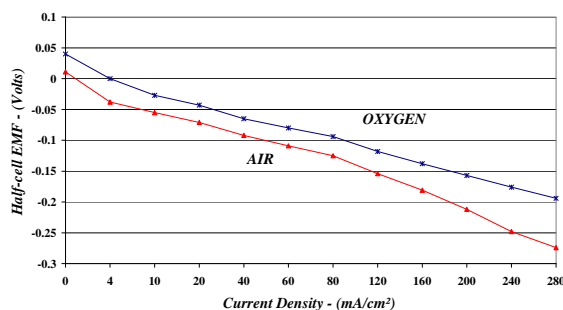
Of the available formulations; Alupower has three systems which can suit most needs. These include the AC-51 (Manganese), AC-65 (Silver), AC-71 (Cobalt-Spinel), AC-75 (COTMPP) and AC-78 (Pt). The general characteristics are as follows:

- Application:** A general-purpose, catalyzed air cathode designed for use in alkaline or saline electrolytes for metal-air cells.
- Operating Range:** AC-65, AC-71, AC-75, and AC-78 are used in applications where the current density is approximately 150 milliamps per square centimeter, whereas AC51 is typically below 50 mA/cm².
- Operating Life:** Life in excess of 1000 hours has been demonstrated in several applications.
- Thickness:** 0.5mm (nominal)
- Basis Weight:** 492 grams per square meter (nominal)
- Safety:** Does not contain mercury, cadmium, lead, lithium, or other dangerous materials.
- Physical Description:** A 4-layer laminate consisting of (a) A current collector of nickel expanded mesh, (b) Two reactive layers, one on each side of the current collector, and (c) A microporous PTFE film on the air side. The product is flexible, strong and chemically resistant to a wide range of substances.
- Dimensions:** Available in widths of up to ten inches and unlimited length.

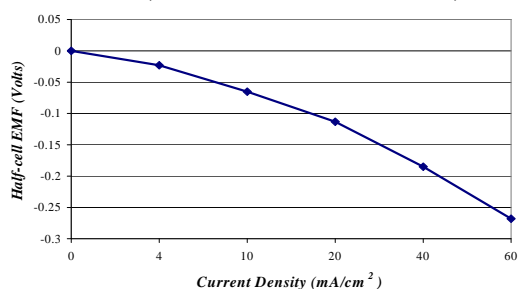
Polarization Voltage of Alupower AC65 Cathode
5M KOH; Hg/HgO reference electrode; 60°C.



Polarization Voltage of Alupower AC71 Cathode.
5M KOH electrolyte. Hg/HgO reference electrode. 60°C.



Polarization Voltages of Alupower AC51 Cathode
12% NaCl; Standard Calomel reference electrode, RT



Alupower, Inc.
2000 South County Trail, East Greenwich, RI 02818-1530
Phone: (401) 471-6580 – Fax: (401) 471-6599
e-mail: mktgmgr@yardney.com