

Air Single Fluid Primary Dry Cell Voltaic Electrolytic Galvanic Chemical

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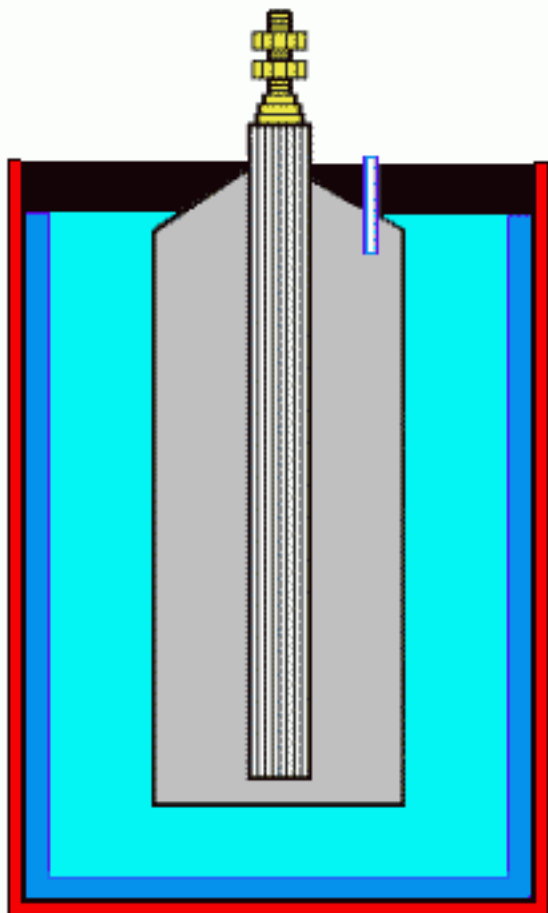


Fig 1. Air Single Fluid Primary Dry Cell

plaster of Paris, flour, sal ammoniac, zinc chloride and gum. Air enters via the small glass tube and provides oxygen that helps the depolarizer. The moisture in the air keeps the cell electrolyte active. Some of these cells keep for very long time. Before use the stopper is removed from the glass breathing tube. and in a few hours, the cell is ready to work.

Like all other primary electrolytic cells, **this cell is also generating electricity by chemical action.** Chemical action results in the change of substances from their original form to a new substance with new properties. **Voltaic cells produce electrical energy by direct conversion** that is a result of a redox chemical reaction.

The **air cell has an open circuit voltage of 1.5 Volt.** It is able to supply weak current for a long time. For that reason it was used extensively in the past for powering laboratory instruments, for low current, signaling applications and powering small electric motors.

Alessandro Volta tried sulfuric acid H_2SO_4 and **alkaline electrolyte**, using kalium (potassium in the US) hydroxide **KOH**. **None of his cells were practical**, because as soon as current was drawn, the polarization effect reduced this current to near zero. During polarization, free hydrogen and oxygen gas collects on the electrodes and polarizes them. The effect of **polarization always opposes the flow of current**. The polarizing gases reduce the electrodes active surface area and after a short while current no longer able to flow.

The **air cell is a single fluid primary voltaic or galvanic dry cell** - Fig. 1. This cell and its many variants are made of carbon and zinc electrodes. It is a modified Leclanché cell. **The air cell is the most successful primary cell in our history!** In the air cell the positive carbon rod is surrounded by the manganese dioxide MnO_2 and graphite powder C depolarizer mixture. The cell is by no means dry, and their success in working depends upon the contents kept moist. The negative zinc electrode is the container of the cell. The **electrolyte** is a paste of

Many different air cell variations are known and used. Air cells were widely used around the early part of the 1900s for laboratory experiments and railroad and telegraph signaling. Air cell components can be left as it is after use, and the battery is continuously useable. The **currently used dry cells are an improved version** of the original air cell. The popular air cells helped to power the rapid development for the newly emerging postal, rail and transportation sectors between the years of the late 1700s to 1920 and beyond.

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