



19CH101– ENGINEERING CHEMISTRY

Unit-5 ENERGY SOURCES AND STORAGE DEVICES

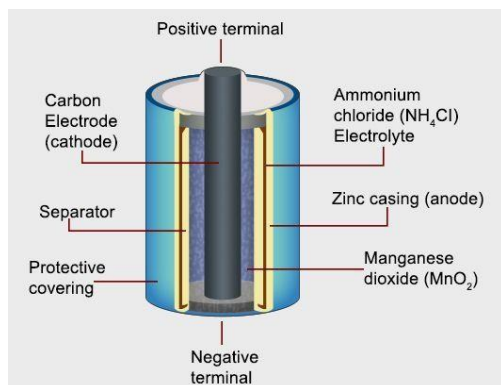
DRY CELL

A **dry cell** is a type of electric battery, commonly used for portable electrical devices. It was developed in 1886 by the German scientist Carl Gassner, after development of wet zinc–carbon batteries by Georges Leclanché in 1866. The modern version was developed by Japanese Sakizō Yai in 1887.

DESIGN

A dry cell uses a paste electrolyte, with only enough moisture to allow current to flow. Unlike a wet cell, a dry cell can operate in any orientation without spilling, as it contains no free liquid, making it suitable for portable equipment. By comparison, the first wet cells were typically fragile glass containers with lead rods hanging from the open top and needed careful handling to avoid spillage. Lead–acid batteries did not achieve the safety and portability of the dry cell until the development of the gel battery. Wet cells have continued to be used for high-drain applications, such as starting internal combustion engines, because inhibiting the electrolyte flow tends to reduce the current capability.

A common dry cell is the zinc–carbon cell, sometimes called the dry Leclanché cell, with a nominal voltage of 1.5 volts, the same as the alkaline cell (since both use the same zinc–manganese dioxide combination).





A standard dry cell comprises a zinc anode, usually in the form of a cylindrical pot, with a carbon cathode in the form of a central rod. The electrolyte is ammonium chloride in the form of a paste next to the zinc anode. The remaining space between the electrolyte and carbon cathode is taken up by a second paste consisting of ammonium chloride and manganese dioxide, the latter acting as a depolariser. In some designs, often marketed as "heavy duty", the ammonium chloride is replaced with zinc chloride.

TYPES

Primary cells are not rechargeable and are generally disposed of after the cell's internal reaction has consumed the reactive starting chemicals.

Secondary cells are rechargeable, and may be reused multiple times.

- Zinc-carbon cell
- Alkaline cell
- Lithium cell
- Mercury cell
- Silver-oxide cell

These are some examples of dry cells