

2.0 Overview

Cells are now widely available in many sizes and designs. Cylindrical cells dominate the rechargeable battery market, but prismatic and button (or coin) cells are used in designs where space available for the batteries are limited.

2.1 Construction

Each cell design (i.e. cylindrical, prismatic, and button) consists of

Four basic internal elements

- Positive electrode
- Negative electrode
- A synthetic separator
- An aqueous solution called electrolyte

Three external elements

- The metal can (or case)
- Vent-cap assembly (with safety vent)
- Polymer gasket

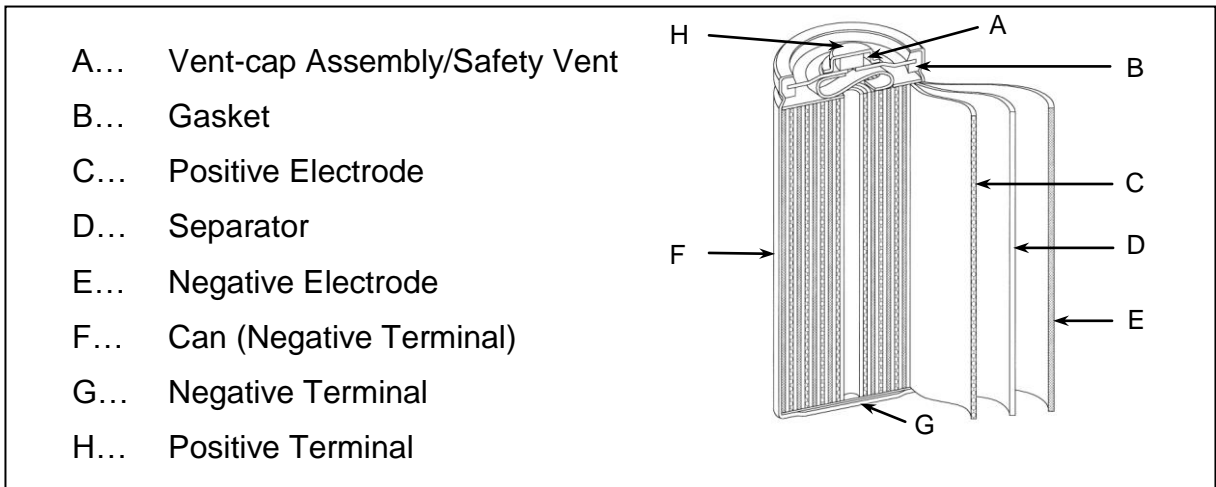
Note: In cylindrical and prismatic cell designs the negative terminal is considered the entire can of the cell and the vent-cap assembly is considered the positive terminal. Button cells the construction is just the opposite; the cap assembly (without a safety vent) is the negative terminal, and the can (or cup in this case) is the positive terminal.

2.1.1 Cylindrical Cells

Cylindrical cells are manufactured by spirally winding two electrodes (positive and negative), with a separator between them, into a bundle. The bundle of electrodes and separator is inserted into a nickel-plated steel can. Electrolyte is then added and absorbed by the electrodes and separator. The positive electrode is welded to a vent-cap assembly, and crimping the can over the vent-cap with a gasket between the can and vent-cap seals the cell. The negative terminal is the can and the positive terminal is the vent-cap assembly with the gasket separating the two. Within the vent-cap is a self-sealing safety vent to prevent excessive pressure building up within the cell. See Figure 2.4 Cylindrical Cell Construction.

¹ Contact Harding for listing of current items in stock

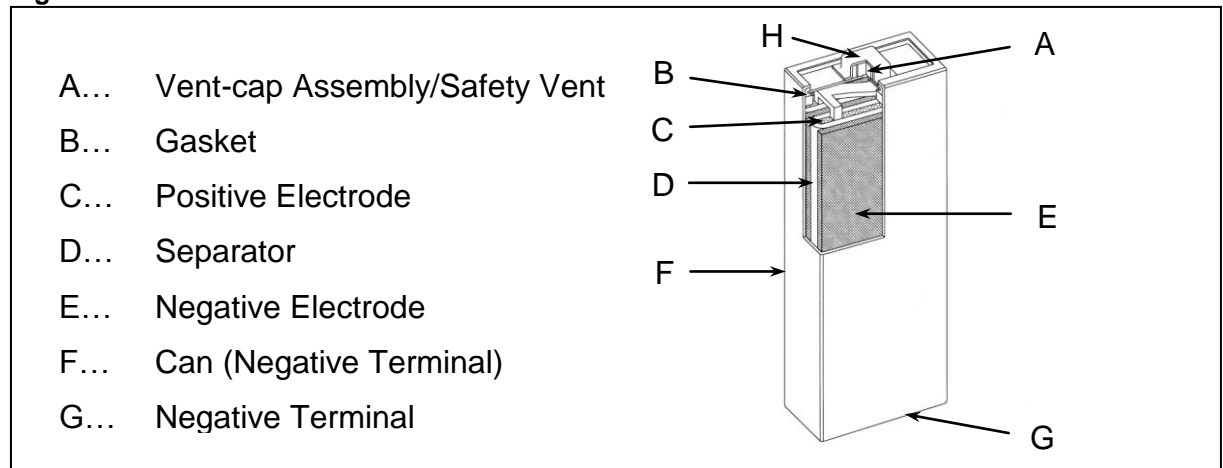
Figure 2.4 Cylindrical Cell Construction



2.1.2 Prismatic Cells

Prismatic cells are manufactured with rectangular electrodes interspaced by separator sheets. The positive electrodes are welded to a vent-cap assembly. The electrodes are then placed in a nickel-plated can and electrolyte is added. Crimping the vent-cap assembly into the can seals the cell. The negative terminal is the can and the positive terminal is the vent-cap assembly with a gasket separating the two. Within the vent-cap assembly is a self-sealing safety vent similar to the one used in cylindrical cells. See Figure 2.5 Prismatic Cell Construction.

Figure 2.5 Prismatic Cell Construction



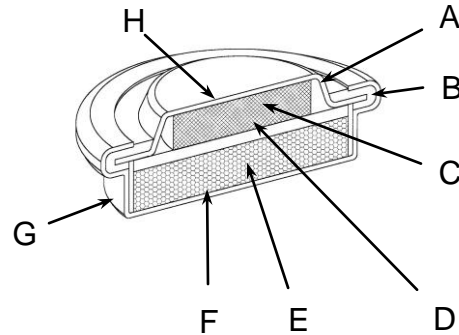
2.1.3 Button Cells

Button cells are manufactured with circular disc of electrodes with a separator sheet in between. The assembly is placed into a nickel-plated cup and electrolyte is added. Crimping a cap into the cup seals the cell with a gasket separating the two. See Figure 2.6 Button Cell Construction.

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Figure 2.6 Button Cell Construction

- A... Cap
- B... Gasket
- C... Negative Electrode
- D... Separator
- E... Positive Electrode
- F... Cup (Positive Terminal)
- G... Positive Terminal



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