# Zinc/Silver Oxide Batteries
# Also called Silver Zinc Batteries

**Characteristics**
Common low capacity primary button cell versions are typically called **Silver Oxide** batteries. Higher capacity versions available as secondary cells are more often referred to as **Silver Zinc** batteries. They have an open circuit voltage of 1.6 Volts. Two types of Silver Oxide batteries are available, one type with a sodium hydroxide (NaOH) electrolyte and the other with a potassium hydroxide (KOH) electrolyte. Because of the high cost of sliver they are available in either very small sizes as button cells where the amount of silver used is small and not a significant contributor to the overall product costs or they are available in very large sizes for critical applications where the superior performance characteristics of the silver oxide chemistry outweigh any cost considerations.

**Advantages**
High capacity per unit weight.
Long operating life. A tiny button cell will keep a watch running 24 hours per day for 3 to 5 years!!
Low self discharge and hence long shelf life (better than zinc air)
Better low temperature performance than zinc air
Flat discharge characteristics - flatter than the Alkaline Manganese Dioxide battery.
Higher voltage than zinc mercury cells..

**Shortcomings**
Uses expensive materials.
Lower energy density than zinc air.
Poor low temperature performance.
Limited cycle life.
Suffers from dissolving of the Zinc and the formation of Zinc dendrites which pierce the separator.

**Applications**
A major contribution to miniature power sources.
As a button cell it is well suited for hearing aids, instruments, photographic applications, electronic watches and other low power devices.
Larger size Silver Zinc batteries are used in submarines, missiles, underwater and aerospace applications.
Silver Zinc secondary cells being promoted as a safer alternative to Lithium cells. Plans to mitigate the higher costs by implementing a recycling programme.

**Costs**
More expensive than zinc air
Very expensive for high power applications