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Nickel-based batteries:

Nickel cadmium

Nickel cadmium batteries offer several advantages over other battery chemistries currently in use. Nickel cadmiums can take a fast charge, in as little as 15 minutes for some, and can take a charge at lower temperatures. Nickel cadmiums can sustain heavy loads and, when properly maintained, are capable of thousands of charge cycles. They are also an inexpensive option compared to some newer battery chemistries.

Nickel metal hydride

Nickel metal hydride (NiMH) cells have steadily increased in popularity since the late 1980s. Continual increases in performance have made this chemistry an excellent choice for small, lightweight, portable, and handheld applications. Nickel metal hydride batteries offer numerous advantages over batteries of other chemistries. They provide 30-40% more capacity than same-sized NiCd cells, are less prone to “memory effect” than NiCd, present no recycling issues, and are competitively priced—especially compared to lithium-ion batteries.

Nickel–iron battery

The nickel–iron battery (NiFe battery) is a rechargeable battery having nickel(III) oxide-hydroxide positive plates and iron negative plates, with an electrolyte of potassium hydroxide. The active materials are held in nickel-plated steel tubes or perforated pockets. It is a very robust battery which is tolerant of abuse, (overcharge, overdischarge, and short-circuiting) and can have very long life even if so treated. It is often used in backup situations where it can be continuously charged and can last for more than 20 years.

Nickel–zinc battery

A nickel–zinc battery, abbreviated NiZn, is a type of rechargeable battery similar to NiMH batteries, but with a higher voltage of 1.6 V. Larger nickel–zinc battery systems have been known for over 100 years. Since 2000, development of a stabilized zinc electrode system has made this technology viable and competitive with other commercially available rechargeable battery systems. Unlike some other technologies, trickle charging is not recommended

Nickel - Magnesium

Magnesium batteries are batteries with magnesium as the active element at the anode of an electrochemical cell. Both non-rechargeable primary cell and rechargeable secondary cell chemistries have been investigated. Magnesium primary cell batteries have been commercialised and have found use as reserve and general use batteries. Magnesium secondary cell batteries are an active topic of research, specifically as a replacement for or improvement on lithium-ion–based battery chemistries.