

Principal Dry Battery Systems

Typical Characteristics

	Nickel-Metal Hydride (NiMH)	Zinc Chloride (Zn/MnO ₂)	Alkaline Manganese Dioxide (Zn/MnO ₂)	Lithium (Li/FeS ₂)	Silver Oxide (Zn/Ag ₂ O)	Zinc Air (ZnO ₂)	Lithium Coin (Li/MnO ₂)	Lithium (Li/MnO ₂)
Electrochemical System	Nickel-Metal Hydride	Zinc-Manganese Dioxide	Zinc-Alkaline Manganese Dioxide	Lithium-Iron Disulfide	Zinc-Silver Oxide	Zinc-Oxygen	Lithium Manganese Dioxide	Lithium Manganese Dioxide
Voltage per Cell	1.2	1.5	1.5	1.5	1.5	1.4	3.0	3.0
Negative Electrode	Metal Hydride	Zinc	Zinc	Lithium Metal	Zinc	Zinc	Lithium Metal	Lithium Metal
Positive Electrode	Nickel Hydroxide	Manganese Dioxide	Manganese Dioxide	Iron Disulfide	Silver Oxide	Oxygen	Manganese Dioxide	Manganese Dioxide
Electrolyte	20% to 40% weight % solution of potassium hydroxide	Aqueous solution of zinc chloride (may contain some ammonium chloride)	Aqueous solution of potassium hydroxide	Lithium Salt in organic solvent	Aqueous solution of potassium hydroxide or sodium hydroxide	Aqueous solution of potassium hydroxide	Lithium Salt in organic solvent	Lithium Salt in organic solvent
Recharge	Yes	No	No	No	No	No	No	No
Overall Reaction Equations	$MH + NiOOH \rightarrow M - Ni(OH)_2$	$Zn + 2MnO_2 + 2H_2O + ZnCl_2 \rightarrow 2MnOOH + 2Zn(OH)Cl$	$3MnO_2 + 2Zn \rightarrow Mn_3O_4 + 2ZnO$	$4Li + FeS_2 \rightarrow 2Li_2S + Fe$	$Zn + Ag_2O \rightarrow ZnO + 2Ag$	$2Zn + O_2 \rightarrow 2ZnO$	$Li + Mn^{IV}O_2 \rightarrow Mn^{III}O_2(Li^+)$	$Li + Mn^{IV}O_2 \rightarrow Mn^{III}O_2(Li^+)$
Typical Commercial Service Capacities	850 mAh to 2500 mAh	Several Hundred mAh to 38 Ah	30 mAh to 24 Ah	25 mAh to 3000 mAh	5 mAh to 200 mAh	90 mAh to 620 mAh	30 mAh to 620 mAh	800 mAh to 1500 mAh

This document contains typical characteristics for Energizer/Eveready batteries in production at the time of preparation. Since the characteristics of batteries are sometimes modified, please visit www.energizer.com for current information. None of the information constitutes a representation or warranty by Energizer concerning the specific performance or characteristics of any battery.

Principal Dry Battery Systems

Typical Characteristics

	Nickel-Metal Hydride (NiMH)	Zinc Chloride (Zn/MnO ₂)	Alkaline Manganese Dioxide (Zn/MnO ₂)	Lithium (Li/FeS ₂)	Silver Oxide (Zn/Ag ₂ O)	Zinc Air (ZnO ₂)	Lithium Coin (Li/MnO ₂)	Lithium (Li/MnO ₂)
Discharge Curve (shape)	Flat	Sloping	Sloping	Flat	Flat	Flat	Flat	Flat
Temperature Range (storage)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)	-5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)	10°C to 30°C (40% to 70%RH)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)
Temperature Range (operating)	Discharge 0°C to 50°C (32°F to 122°F)	-18°C to 55°C (0°F to 130°F)	-18°C to 55°C (0°F to 130°F)	-40°C to 60°C (-40°F to 140°F)	-10°C to 55°C (14°F to 130°F)	-10°C to 55°C (14°F to 130°F)	-30°C to 60°C (-22°F to 140°F)	-40°C to 60°C (-40°F to 140°F)
Effect of Temperature on Service Capacity	Fair Low Temperature	Poor Low Temperature	Good Low Temperature	Excellent Low Temperature	Good Low Temperature	Good Low Temperature	Excellent Low Temperature	Excellent Low Temperature
Shelf Life at 20°C	5 Years	Up to 3 Years	5 to 12 Years	20 Years	Up to 5 Years	4 Years	10 Years	10 Years

This document contains typical characteristics for Energizer/Eveready batteries in production at the time of preparation. Since the characteristics of batteries are sometimes modified, please visit www.energizer.com for current information. None of the information constitutes a representation or warranty by Energizer concerning the specific performance or characteristics of any battery.