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DURACELL®
Alkaline-Manganese Dioxide

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1 Introduction

Duracell pioneered the alkaline-manganese dioxide electrochemical system nearly 40 years ago. In the 1960-1970 decade, this battery system rapidly became the popular choice of designers in the ever-widening field of consumer electronics. The product information and test data included in this technical bulletin represent Duracell's newest alkaline battery products.

The zinc/potassium hydroxide/manganese dioxide cells, commonly called alkaline or alkaline-manganese dioxide cells, have a higher energy output than zinc-carbon (Leclanche) cells. Other significant advantages are longer shelf life, better leakage resistance, and superior low temperature performance. In comparison to the zinc-carbon cell, the alkaline cell delivers up to ten times the ampere-hour capacity at high and continuous drain conditions, with its performance at low temperatures also being superior to other conventional aqueous electrolyte primary cells. Its more effective, secure seal provides excellent resistance to leakage and corrosion.

The use of an alkaline electrolyte, electrolytically prepared manganese dioxide, and a more reactive zinc powder contribute to a higher initial cost than zinc-carbon cells. However, due to the longer service life, the alkaline cell is actually more cost-effective based upon cost-per-hour usage, particularly with high drains and continuous discharge. The high-grade, energy-rich materials composing the anode and cathode, in conjunction with the more conductive alkaline electrolyte, produce more energy than could be stored in standard zinc-carbon cell sizes

2 General Characteristics

The general characteristics listed below are a summary of the significant benefits of the alkaline manganese dioxide system. Each of the benefits is explained in greater detail subsequently in Section 5. This summary provides the designer with general guidelines for evaluating the alkaline-manganese dioxide system for a particular application.

Benefits include:

- Up to ten times the service life of regular zinc-carbon cells.
- Long service life at continuous, high drain discharge.
- No need for "rest periods."
- Low internal resistance.
- Rugged, shock-resistant construction.
- Cost-effective on a cost-per-hour-of-service basis.
- Good low temperature performance.
- Excellent leakage resistance.
- Long shelf life.
- Worldwide availability at retail.