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## TECHNICAL/OEM

### Primary Systems

#### Lithium Manganese Dioxide

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#### TECHNICAL BULLETIN

##### Care and Handling Precautions



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#### CARE AND HANDLING PRECAUTIONS

DURACELL Li/MnO<sub>2</sub> state of the-art batteries will provide long, reliable service when used in an appropriate manner and under those conditions recommended for each size and type. To achieve optimum performance, the following precautions should be observed:

- Due to the high energy output of Li/MnO<sub>2</sub> batteries and transportation requirements, no more than four cells of the same type should be connected in series for a total of 12 volts, unless approved by Duracell.
- Batteries should be used only under the operating conditions specified for each cell size.
- All batteries in equipment should be replaced at the same time.
- Li/MnO<sub>2</sub> batteries should not be recharged. This could result in venting, fire or explosion.
- When incorporating a Li/MnO<sub>2</sub> battery into a memory backup circuit, a blocking diode and second series diode or current limiting resistor should be used to prevent the main power source from charging the battery (see Section 7).
- When inserting batteries into equipment, proper polarity must be observed to avoid charging, damage to equipment, or batteries.
- Connecting cells in parallel could result in charging one of the cells and cause leakage and potential cell rupture. Diode protection may be required depending upon the cell type. Duracell should be contacted for guidance on applications requiring paralleling of cells.
- Li/MnO<sub>2</sub> batteries should not be incinerated or exposed to high temperatures.
- Soldering should be done only to the tabs, pins or lead wires attached to the batteries. Soldering directly to the battery surface can cause internal damage, leakage, and possible cell rupture.
- When wave soldering a battery onto a printed circuit board, the battery is momentarily short-circuited, causing a drop in voltage. The voltage of the battery will recover quickly when wave soldering is completed. The length of time a battery is under a short-circuit during this procedure should be kept to a minimum; no more than five seconds is recommended. If a preheating or drying procedure is used, care should be taken to keep the temperature of the battery below 85°C (185°F).
- As with all batteries, extreme care should be taken to avoid dropping Li/MnO<sub>2</sub> batteries into a solder bath. This can cause batteries to explode.
- Li/MnO<sub>2</sub> batteries should not be short-circuited.

- Li/MnO<sub>2</sub> batteries should not be disassembled, crushed, punctured or otherwise mutilated.
- A cell with a damaged container should not be exposed to water or other liquid oxidants. Lithium metal is extremely reactive in water, producing hydrogen and lithium hydroxide.
- Batteries of various chemical systems should not be mixed. All lithium batteries are not the same and are not interchangeable.
- Batteries should not be exposed to chemicals that can dissolve ABS, polypropylene, polyvinyl chloride, mylar, nickel or steel.
- The safety vent mechanism in the cell top of low rate bobbin and high rate spiral-wound cells should not be obstructed or impaired by applying potting compounds, epoxies, hot melts, etc., in the vent region. (See previous discussion on the safety vent mechanism.)
- Batteries should be kept away from small children. In the event of leakage of electrolyte, wash off affected skin with water. If eyes are affected, they should be irrigated with large amounts of warm water. If swallowed, contact your physician or call the National Capital Poison Center at 202-625-3333 collect. (IF POSSIBLE, LET'S SEE IF THIS CAN BE SET UP AS A LINK TO THIS ORGANIZATION.)
- Li/MnO<sub>2</sub> batteries should be stored in ambient conditions, preferably in a cool, dry place. Li/MnO<sub>2</sub> batteries have excellent capacity retention characteristics and need not be refrigerated. Storage at higher than ambient temperatures should be avoided if possible in order to maximize shelf life.