

## MATERIAL SAFETY DATE SHEET

### 1. Chemical Product

Product name: Alkaline batteries

### 2. Composition /Information on Ingredients:

Chemical Nature: Mixture

CAS-No/EINECS NO.: Not applicable :

Dangerous ingredients which have to be mentioned acc. To 99/45/EEC and it adaptations

Chemical Name	HAZARDOUS%	CAS No.	TLV(UNITS)
Manganese Dioxide	36-43	1313-13-9	5 mg/m3
Zinc	13-18	7440-66-6	10 mg ZnO/m3
Potassium Hydroxide (40%)	4-9	1310-58-3	2 mg/m3
Graphite, natural	1-4	7782-42-5	2 mg/m3
Zinc Oxide	<1	1314-13-2	10 mg/m3

### 3. Hazards identifications

General:	The Common known rules for handing of chemicals should be obeyed. Do not eat drink the product.
Physical-Chemical Hazards:	This preparation is not classified as dangerous according to the criteria of directive 99/45/EEC
Hazards to man:	LD50-LC50 Mixture: LD 50 oral rat is unknown Route of entry - Inhalation: NO Route of entry - Skin: YES Route of entry - Ingestion: NO No health hazard unless battery ruptures. In that event, it may cause burns and irritation.
Hazards to environment:	Not applicable.



**4. First –aid measures:**

Inhalation:	Not anticipated. If battery is leaking, contents may be irritating to respiratory passages. Remove to fresh air. Contact physician if irritation persists.
Skin Contact:	Not anticipated. If battery is leaking, irrigate exposed skin with copious amounts of clear, tepid water for at least 15 minutes. If irritation, injury or pain persists, consult a physician.
Eye contact:	Not anticipated. If battery is leaking and material contacts eyes, flush with copious amounts of clear, tepid water for 30 minutes. Contact physician at once.
Ingestion:	Not anticipated. Rinse the mouth and surrounding area with clear, tepid water for at least 15 minutes. Consult a physician immediately for treatment and to rule out involvement of the esophagus and other tissues.

Notes to Physician:

- 1) The primary acutely toxic ingredient is concentrated (40%) potassium hydroxide.
- 2) Anticipated potential leakage of potassium hydroxide is 1-3 ml, depending on battery size.
- 3) This MSDS does not include or address the small button cell batteries, which can be ingested.

**5. Fire-fighting measures**

Suitable extinguishing media:	As appropriate for surrounding area.
Exposure hazards from combustion products:	In case of fire, thermal degradation may produce hazardous fumes of zinc and manganese; hydrogen gas; caustic vapors of potassium hydroxide and other toxic by-products.
Personal protective equipments:	Wear full protective clothing. Use self contained breathing apparatus.

**6. Accidental release measures:**



Personal precautions:	Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured batteries. Avoid eye or skin contact and inhalation of vapors. Increase ventilation. Clean-up personnel should wear appropriate protective wear.
Environmental precautions:	In the event of battery rupture, prevent released material from entering drains.
Methods for cleaning up:	In the event of battery rupture, collect all released material in plastic bag for waste disposal. Flush residue with Plenty of water. Care for well-Ventilated conditions. Recycle or dispose of the materials in an appropriate way.

### 7. Handling and storage

Store at room temperature. Avoid mechanical or electrical abuse. Do not short or install incorrectly. Batteries may explode, pyrolyze or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Do not mix battery systems, such as alkaline and zinc carbon, in the same equipment. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag. Do not remove battery label.

### 8. Exposure controls/Personal protection

Exposition/ Technical measures:	General ventilation under normal use conditions.
Eye Protection:	None under normal use conditions. Wear safety glasses when handling leaking batteries.
Skin Protection:	None under normal use conditions. Use neoprene, rubber or latex gloves when handling leaking batteries.
Respiratory Protection:	None under normal use conditions.
Other:	Keep batteries away from small children.

### 9. Physical and chemical properties

Appearance And Odor: N/R	Boiling Point: N/R	Melting Point: N/R
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Vapor Pressure (MM Hg/70 F): N/R	Vapor Density (Air=1): N/R	Specific Gravity: N/R
Decomposition Temperature: UNKNOWN	Evaporation Rate And Ref: N/R	Solubility In Water: N/R
Percent Volatiles By Volume: N/R	Viscosity: N/R	pH: N/R
Corrosion Rate (IPY): UNKNOWN	Autoignition Temperature: N/R	

### 10. Stability and Reactivity

Stability:	YES
Condition to avoid (Stability):	Avoid electrical shorting.
Materials to avoid:	NOT APPLICABLE
Hazardous decomposition products:	Oxides or fumes of manganese, zinc, potassium hydroxide.
Hazardous Poly Occur:	NO
Conditions To Avoid (Poly):	NOT APPLICABLE

### 11. Toxicological information

The product is multi component mixture for which no toxicological data exists.

### 12. Ecological information

In general, no ecological data is available for preparations.

### 13. Disposal considerations

Waste disposal method:	Individual consumers may dispose of spent (used) batteries with household trash. Samsung C&T Corporation does not recommend that spent batteries be accumulated (quantities of five gallons or more should be disposed of in a secure landfill), if recycling is not possible, the product have to be disposed of in accordance with your local legislation and regulations. Do not incinerate, since batteries may explode at excessive temperatures.
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**14. Transport Information**

Road (ADR/RID)	: not regulated
Air (ICAO/IATA)	: not regulated
Sea (IMDG)	: not regulated

**15.Regulatory Information**

None

**16.Other information**

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