



Material Safety Data Sheet (MSDS)

Sample Name: alkaline manganese button batteries

Tested Model: AG0/LR521/379A;AG1/LR621/364A;AG2/LR726/396A;AG3/LR41/392A;AG4/LR626/377A;AG5/LR754/393A;AG6/LR921/371A;AG7/LR927/395A;AG8/LR1120/391A;AG9/LR936/394A;AG10/LR1130/389A;AG11/LR721/362A;AG12/LR43/386A; AG13/LR44/357A

Client Name: Removed by K.I.

Client Address: Removed by K.I.

WRITTEN BY

Zoey Zhang

Zoey Zhang

REVIEWED BY

Kira Fu

Kira Fu

Soar Testing Certification
(GuangDong) Co., Ltd.



Approved signatory

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945

Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com

Website: <http://www.soar-test-lab.com>

Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Sample Name: alkaline manganese button batteries

Tested Model: AG0/LR521/379A;AG1/LR621/364A;AG2/LR726/396A;AG3/LR41/392A;AG4/LR626/377A;AG5/LR754/393A;AG6/LR921/371A;AG7/LR927/395A;AG8/LR1120/391A;AG9/LR936/394A;AG10/LR1130/389A;AG11/LR721/362A;AG12/LR43/386A; AG13/LR44/357A

Client Name: Removed by K.I.

Client Address: Removed by K.I.

Section 2 - Hazards Identification

Fatality grade: Basically non-toxic for itself, But exposure to the ingredients contained or their ingredients products could be dangerous.

Chemical Name	CAS No.	GHS hazard category	Hazard statement
Manganese dioxide	1313-13-9	Acute Toxicity - Oral Category 4 Acute Toxicity - Inhalation Category 4	H302 Harmful if swallowed. H332 Harmful if inhaled.
Zinc	7440-66-6	Not classified	Not classified
Iron	7439-89-6	Not classified	Not classified
Potassium hydroxide	71769-53-4	Acute Toxicity - Oral Category 4 Skin Corrosion / Irritation Category 1A	H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage.
Graphite	7782-42-5	Not classified	Not classified
Water	7732-18-5	Not classified	Not classified
Nylon 66	32131-17-2	Not classified	Not classified
Separator	—	Not classified	Not classified

Label elements:

(Manganese dioxide CAS No. 1313-13-9) Pictogram:



GHS07

(Potassium hydroxide CAS No. 71769-53-4) Pictogram:



GHS07

GHS05

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrer to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945 Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com Website: <http://www.soar-testlab.com>



Warning word: Danger

Precautions:

Preventive measures:

- P264 Thoroughly clean after operation.
- P270 Do not eat, drink, or smoke when using this product.
- P261 Avoid inhaling dust/smoke/gas/smoke/vapor/spray.
- P271 can only be used outdoors or with good ventilation.
- P260 Do not breathe dust/smoke/gas/smoke/vapor/spray.
- P280 Wear protective gloves/protective clothing/protective goggles/protective masks.

Accident response:

- P301+P312 If swallowed by mistake: If feeling unwell, call detoxification center/doctor
- P330 Rinse your mouth
- P304+P340 If accidentally inhaled: Transfer the person to a place with fresh air and maintain a comfortable breathing position.
- P312 If feeling unwell, call the detoxification center/doctor
- P301+P330+P331 If swallowed by mistake: Rinse mouth. Do not induce vomiting.
- P303+P361+P353 If skin (or hair) is contaminated: immediately remove all contaminated clothing. Wash skin/shower with water.
- P363 Clothes contaminated with can only be reused after cleaning.
- P310 Immediately call the detoxification center/doctor
- P321 specific treatment (see... on this label).
- P305+P351+P338 If in the eyes: Rinse with water carefully for a few minutes. If wearing contact lenses and easily removing them, remove the contact lenses. Continue rinsing.

Safe storage:

- P405 The storage area of must be locked.

Disposal:

- P501 Dispose of contents/containers in accordance with local regulations.

Invasion route:

Skin contact: There will be no dangerous during normal use. But contacting battery electrolyte, may cause severe irritation or burns.

Eye contact: There will be no dangerous during normal use. But contacting battery electrolyte, can stimulate or burn the eyes. Even possible damage to the eyes.

Inhalation: There will be no dangerous during normal use. But breathe in a large number of batteries, or heat released from the gas, it will stimulate the respiratory tract and eyes.

Ingestion: Ingestion of internal chemical materials may cause mouth, throat and intestinal irritation and damage. Get medical aid.

Health hazards: The battery pack is stored in a sealed tank. When the battery or the occurrence of mechanical

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945 Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com Website: <http://www.soar-test-lab.com>



collisions are likely to lead to the leakage of chemical substances in the battery. Skin and eyes should avoid contact with electrolyte or extruded battery.

Environment hazards: Ingredients contained or their ingredients products could be harmful to environment.

Burn & burst danger: If heated strongly by the surrounding fire, acrid gas and flammable gas may be emitted and may cause explode dangerous.

Section 3 –Composition/Information on Ingredient

Pure ☐Admixture ☒

Composition:

Chemical Name	CAS No.	Composition In % By Weight (in% by weight)
Manganese dioxide	1313-13-9	22.93%
Zinc	7440-66-6	11.29%
Iron	7439-89-6	49.5%
Potassium hydroxide	71769-53-4	3.07%
Graphite	7782-42-5	3.06%
Water	7732-18-5	5.24%
Nylon 66	32131-17-2	2.94%
Separator	—	1.97%

Section 4- First Aid Measures

The cell is not hazard with eye and skin contact under normal circumstance. In case of the enclosure is damaged, the cell can not be sued and touched. It is safety except that the cell is damaged by fired or rupture. The leakage of internal hazardous substance and formation of hazardous substance would occur, take the following measures if contact with the cell.

Skin touch: Wash with plenty of soap and water. If the skin is irritable, get medical aid.

Eyes touch: Lifting the upper and lower eyelids, flush the eyes with plenty of water or saline water. Get medical aid.

Inhalation: If exposure to fumes from overheating, move to fresh air immediately. Keep the respiratory tract smooth. Use oxygen if available. Get medical aid.

Ingestion: Rinse mouth out with water. Get medical aid immediately.

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945

Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com

Website: <http://www.soar-test.com>

Section 5 - Fire Fighting Measures

Danger characteristic: Meet high heat, flame, there may cause explode danger.

Hazardous combustion products: Carbon monoxide, carbon dioxide, metal oxide, irritating smoke, etc..

Fire-Fighting method & media: The staff must equip with filtermask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Avoid using direct streams of water or foam on molten burning material as it may scatter and spread the fire. Fire extinguishing agent: dry powder, carbon dioxide, sand.

Section 6 - Accidental Release Measures

Personal precautions: If the cell is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate. Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the cell happens, liquid could be absorbed by sand, earth or other inert substance and contaminated area should be ventilated meantime.

Environment precautions: Make an limitation for burning and throwing into garbage. Do not flush into surface water.

Section 7 - Handling and Storage

Handling: Avoid mechanical damage or battery power abuse. Don't make the battery short. Don't hit or puncture the battery, or immerse the battery in the liquid. Don't disassemble the battery or the battery into the fire. Don't store together with the metal, or make the positive and negative pole short.

Storage: Stored in a cool, dry, ventilated place with small change temperature. Don't store batteries in high temperature places with fire source. Don't expose the batteries directly to the sun for a long time.

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945

Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com

Website: <http://www.soartestlab.com>



Section 8 - Exposure Controls, Personal Protection

Maximum admissible concentration: No standard yet

Monitoring Method: None.

Engineering Control: To supply with sufficient air exhaust.

Respiratory Protection: No necessary under normal use. In case electrolyte leakage from the cell, protect hand with chemical resistant rubber gloves. If cell is burning, leave the area immediately.

Eyes Protection: None required under normal conditions. Use approved chemical work safety goggles or face shield, if handling a leaking or rupture cell.

Skin Protection: No necessary under normal use. Use rubber apron and protective working in case of handling of a rupture cell.

Hands Protection: No necessary under normal use. In case of spilling, use PVC, neoprene or nitrile gloves of 15 mils(0.015 inch) or thicker.

Other Protections: Chemical resistance clothing is recommended along with eye wash station and safety shower should be available. Work hygienic practices: Use good chemical hygiene practice. Wash hands after use and before drinking, eating or smoking. Wash hands thoroughly after cleaning-up component spill caused by leaking cell. No eating, drinking, or smoking in cell storage area.

Section 9 - Physical and Chemical Properties

Appearance: Solid

Color: No specific data.

Odour: Odorless

Flash point: N/A

Ignition temperature: N/A

Boiling point/range: No specific data.

Melting point/range: No specific data.

Upper flammable(explosive) limits in air-Lower (vol%)-UEL: No specific data.

Oxidising properties: No specific data.

Partition coefficient (n-octanol / water): No specific data.

Viscosity: No specific data.

Vapour density: No specific data.

Evaporation rate: No specific data.

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945 Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com Website: <http://www.soar-test-lab.com>



Section 10 - Stability and Reactivity

Stability: Stable under normal temperature and pressure.

Distribution of Ban: Strong oxidizing agents, reducing agents, acids and bases.

Conditions to Avoid: Fire, high temperature.

Hazardous Polymerization: None.

Hazardous Decomposition Products: Carbon dioxide and hydrogen fluoride gas may be generated during combustion of cell.

Section 11 - Toxicological Information

Acute Toxicity: Normal use has no known significant effects or critical hazards.

Sub-acute and Chronic Toxicity: Normal use has no known significant effects or critical hazards.

Irritation: The battery electrolyte has a certain stimulus.

Sensitization: Normal use has no known significant effects or critical hazards.

Mutagenicity: Normal use has no known significant effects or critical hazards.

Carcinogenicity: Normal use has no known significant effects or critical hazards.

Others: The material in the battery is sealed, and when the user uses the battery according to the instructions, the possibility of the internal solution leakage is negligible. However, the battery abuse will cause the battery internal solution leakage possibly.

Section 12 - Ecological Information

Eco-toxicity: No known significant effects or critical hazards.

Biodegradable: No specific data.

Non-biodegradable: No specific data.

Bioconcentration or biological accumulation: No specific data.

Other harmful effects: No known significant effects or critical hazards.

Section 13 - Disposal Considerations

Nature of waste: No data.

Waste disposal methods:

- Disposal of the cell should be performed by permitted, professional disposal firms knowledgeable in federal, state or local requirements of hazardous waste treatment and hazardous waste transportation.
- Incineration should never be performed by cell used. The batteries contained recyclable materials. Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.

The cell should have their terminal insulated in order to prevent short circuits during transportation to the disposal site.

Note: Consult your local or region authorities, disposal maybe subject to national, state, or local laws.

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945

Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com

Website: <http://www.soar-testlab.com>



Section 14 - Transport Information

Number of dangerous goods: No data available

UN Number: No data available

Packaging Mark: No data available

Packaging Method: No data available

Transport fashion: By air, sea, rail, highway, suggestion according to IMO International Maritime Dangerous Goods (IMDG) Code (IMDG CODE 40-20) 2020ED, the substance is not subject to IMO IMDG Code.

Suggestion according to IATA Dangerous Goods Regulations (DGR) 64th Edition (2023), the substances is not subject to IATA DGR according to special provision A123.

Transport Attentions:

These cells classified as alkali-manganese of "Dry cell" and should not be transported as Class 9 hazardous material. It is classified as non-dangerous goods. "Dry cell" batteries are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and the International Maritime Organization (IMO). The only requirements for shipping these cells by DOT is Special Provision 130 which states: "Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals)."

Section 15 - Regulatory Information

Regulatory Information: ISO 11014-2009 Safety data sheet for chemical products - Content and order of sections. Regulation (EC) No. 1272/2008 Classification, Labelling and Packaging of Substances and Mixtures.

Section 16 - Additional Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier, nor any its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Remark: The evaluation report is based on official website data and customer supply information, only for customer research, teaching, internal quality control, product development and other purposes, for reference only.

*** End of Report ***

Note: This Test report shall be invalid if it is not stamped with the special seal for testing. Only responsible for the tested samples, invalid if rewritten, added and deleted. This test report cannot be reproduced, except in full, without prior written permission of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this report is unlawful and offenders may be prosecuted to the fullest extent of the law. Any demurrals to the content of test report, please propose in 15 days.

Lab name: Soar Testing Certification (GuangDong) Co., Ltd.
Post Code: 523945

Tel: (86-769) 38937518

Address: Room 1063, No.12, East of Houjie Avenue, Houjie, Dongguan, Guangdong, China
E-mail: service@soar-cert.com

Website: <http://www.soar-test-lab.com>