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## MATERIAL SAFETY DATA SHEET

**ACCORDING TO 91/155/EEC AND ISO 11014-1**

**DATE:** Jan 10, 2012

**NUMBER:** 110810MSDSEU

**IDENTITY (As Used on Label and List)**

**Product name:** Zinc-manganese Battery

**Type:** R20/R14/R6P/R03/6F22

### SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Manufacturer's Name:**

Shenzhen Guanlida Electronics Co., Ltd.

**Address (Number, Street, City, State, and ZIP Code):**

Baoan District of Shenzhen City Xixiang Street, 62 District, Ansheng industrial city on the fourth floor.

**Emergency Telephone Number:** +86-755-29979729

**Fax Number for Information:** +86-755-61640001

**Contact Person:** Yang

**E-Mail:** glida@glida.cn

### SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent	EC#	CAS No.
Manganese Dioxide	48%	215-202-6	1313-13-9
Zinc	25.8%	231-175-3	7440-66-6
Acetylene	3.8%	200-816-9	74-86-2
Others	0.84%	N/A	N/A

### SECTION III - HAZARDS IDENTIFICATION

**Routes of Entry:**

Inhalation: Yes

Skin: Yes

Eye: Yes

Ingestion: Yes

**Inhalation:** During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach in the battery cell case, exposure to the constituents may occur.

**Ingestion:** If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.



**Skin:** Exposure to the electrolyte contained inside the battery may result in chemical burns.

**Eye:** Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

#### SECTION IV - FIRST AID MEASURES

**Eye:**

Wash thoroughly with running water. Get medical advice if irritation develops.

**Skin:**

If the internal cell materials of an opened battery cell come into contact with the skin, immediately flush with water for at least 15 minutes. Take off the contaminated clothes immediately. Get medical advice if irritation develops.

**Inhalation:**

Remove to fresh air. Get medical attention for any breathing difficulty.

**Ingestion:**

Do not induce vomiting, seek immediate medical attention.

#### SECTION V - FIRE FIGHTING MEASURES

**Extinguishing Media:**

Use water, foam or dry powder, as appropriate to extinguish fire.

**Fire Fighting Procedures:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full-face piece operated in the pressure demand or other positive pressure mode. Fight fire from the maximum distance. Evacuate area.

**Specific Hazards:**

When involved in a fire, this material may decompose and produce irritating fumes which is harmful for fire-fighter.

#### SECTION VI - ACCIDENTAL RELEASE MEASURES

**Personal Precautions:**

Wear appropriate personal protective equipment as specified in Section VIII.

**Methods of Clean up:**

Spill and leaks are unlikely because cells are contained in a hermetically sealed case. In the event of a battery rupture, prevent skin contact and collect all released material in a plastic lined metal container. Dispose in accordance with applicable state and federal regulations.



## SECTION VII - HANDLING AND STORAGE

### Handling and Storage:

Use and store at room temperature. Avoid mechanical or electrical abuse. DO NOT short or install incorrectly. Batteries may explode, pyrolyze or vent if disassembles, crushed, recharged or exposed to high temperature. 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.

## SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines:

Manganese Dioxide (as Mn): 5.0 mg/m<sup>3</sup> (OSHA); 0.2 mg/m<sup>3</sup> (ACGIH)

Zinc (as ZnO, dust): 2 mg/m<sup>3</sup> (ACGIH)

### Engineering measure:

Use general ventilation under normal use condition.

### Personal protection equipment:

**Respiration protection:** Not required under normal use.

**Eye protection:** Not required under normal use. Wear safety glasses or face shield as appropriate when handling leaking batteries.

**Hand protection:** Not required under normal use. Use gloves when handling leaking batteries.

**Skin and Body Protection:** Not required under normal use. Use protected clothes when handling leaking batteries.

### Recommended decontamination facilities:

Eye bath, safety shower, washing facilities.

## SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

**Odor:** Odorless

**Appearance:** Colored cylinder solid.

**Melting Point:** >300°C

**Solubility:** Partial soluble in water / slightly soluble in acetone / slightly soluble in ethanol.

**Ignition temperature:** The rate of burning is less than 2.2mm/s, so the substance does not belong to flammable solid.

**pH:** 7-8



## SECTION X - STABILITY AND REACTIVITY

**Stability:**

The product is considered stable under normal conditions.

**Materials to Avoid:**

The battery cells are encased in a non-reactive container; however, if the container is breached or ruptured, avoid contact of internal battery components with acids, strong oxidizing agents.

**Stability Condition to Avoid:**

Avoid heat, open flames, moisture, crush, disassemble, short circuit or recharge.

**Hazardous Decomposition Products:**

Thermal degradation may produce hazardous fumes of zinc, manganese dioxide and other toxic by-products.

## SECTION XI - TOXICOLOGICAL INFORMATION

**Manganese Dioxide:**

Harmful by inhalation or ingestion. Long term exposure to manganese compounds may reduce fertility in men.

**Toxicity data:**

ORL-RAT LD50 > 3478 mg/kg

**Zinc:**

May be harmful if swallowed or inhaled. May act as an irritant.

## SECTION XII - ECOLOGICAL INFORMATION

**Environmental Toxicity:**

On the basis of available information, this material is not expected to produce any significant adverse environmental effects when recommended use instructions are followed.

## SECTION XIII - DISPOSAL CONSIDERATIONS

**Waste Disposal Methods:**

Individual consumers may dispose of spent (used) batteries with household trash. This product does not recommend that spent batteries be accumulated (quantities of five gallons or more should be disposed of in a secure landfill), in accordance with Federal, State or Local Laws and Regulations. Do not incinerate, since batteries may explode at excessive temperature.



## SECTION XIV - TRANSPORT INFORMATION

Zinc-manganese batteries are considered to be "dry cell" batteries and are not subject to dangerous goods regulation for the purpose of transportation by the U.S. Department of Transportation (DOT), the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) or the International Maritime Dangerous Goods regulations (IMDG). The only DOT requirement for shipping zinc-manganese batteries 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)." IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

## SECTION XV - REGULATORY INFORMATION

### Overview:

Do not dispose in fire, mix with other battery types, recharge, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

Observe all warnings and precautions listed for the product before use.

The children should be instructed before they make use of the product.

### Manganese Dioxide:

**EC#:** 215-202-6

**CAS#:** 1313-13-9

**Classification and Labelling Information:** Annex I Index# 025-001-00-3

**European Priority Lists and Risk Assessment Information (Council Regulation (EEC) 793/93):**

This chemical substance is not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93 on the evaluation and control of the risks of existing substances.).

**Risk phrases:** R20 R22

**Safety phrases:** S25

### Zinc:

**EC#:** 231-175-3

**CAS#:** 7440-66-6

**Classification and Labelling Information:**

**Annex I Index# (1):** 030-001-00-1

**Substance Name in Annex 1:** Zinc powder - zinc dust (pyrophoric)

**Annex I Index# (2):** 030-002-00-7

**Substance Name in Annex 1:** Zinc powder - zinc dust (stabilized)

**European Priority Lists and Risk Assessment Information (Council Regulation (EEC) 793/93):**

**Rapporteur:** Netherlands

**Priority List#:** 2

**ECB#:** 072

**Safety phrases:** S7 S8 S43.



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**Acetylene:**

**EC#:** 200-816-9

**CAS#:** 1313-13-9

**Classification and Labelling Information:** Annex I Index# 601-015-00-0

**European Priority Lists and Risk Assessment Information (Council Regulation (EEC) 793/93):**

This chemical substance is not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93 on the evaluation and control of the risks of existing substances.).

**Risk phrases:** R5 R6 R12

**Safety phrases:** S2 S9 S16 S33

For details regulations you should contact the appropriate agency in your country.

**SECTION XVI - OTHER INFORMATION**

This data is offered in good faith as typical values and not as a product specification. The information in this data sheet was compiled from information supplied by the vendors of the components of this compound. No warranty, either expressed or implied is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

**NOTE**

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