

**Material Safety Data Sheet**

Ref. no.: GPCL-A23S-2010A

| | |
|--------------------------------------|---|
| IDENTITY (As Read on Label and Line) | Notice: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that. |
| A23S ALKALINE BATTERY | |

Section I

| | |
|--|---|
| Manufacturer's Name Golden Power Corporation (HK) Ltd. | Telephone Number (852) 3125 2288 |
| Address (Number, Sheet, City, State, and ZIP Code) Flat C, 20/F., Block 1, Tai Ping Industrial Centre, 57 Ting Kok Road, Tai Po, N.T., Hong Kong | Fax Number (852) 3125 2000 / 3125 2001 |
| | Date Prepared March 01, 2010 |
| Signature of Preparer (optional) | |

Section II – Hazardous Ingredients/Identity Information

| Hazardous Components (Specific Chemical Identity, Common Names) | (contents, %/wt) | CAS No. |
|---|------------------|-----------|
| Manganese Dioxide (MnO ₂) | 20.76 % | 1313-13-9 |
| Zinc (Zn) | 9.10 % | 7440-66-6 |
| Potassium Hydroxide (KOH) | 2.54 % | 1310-58-3 |
| Graphite (C) | 1.80 % | 7782-42-5 |
| Mercury (Hg) | 0.0045% | 7439-97-6 |
| Lead (Pb) | <0.001 % | 7439-92-1 |
| Cadmium (Cd) | <0.001% | 7440-43-9 |

Section III – Physical/Chemical Characteristics

| | |
|---|--|
| Boiling Point KOH aqua solution = 140 °C | Specific Gravity (H ₂ O=1) MnO ₂ = 4.4, Zn = 7.1, KOH = 2.0 |
| Vapor Pressure (mmHg) KOH aqua solution = 3mmHg at 20 °C | Melting Point MnO ₂ decompose at 535°C Zn = 420 °C, KOH aqua = -35 °C |
| Vapor Density (Air = 1) | Evaporation Rate (Butyl Acetate = 1) |

Solubility in Water KOH – complete

Appearance and Color

MnO₂ is a black powder, Graphite is also a black powder, Zinc is a silver metal.
KOH aqua is a colorless liquid with stimulative order.

Section IV – Fire and Explosion Hazard Data

| | | | |
|--|-----------------------------------|-----|-----|
| Flash Point (Method Used) Incombustible | Flammable Limits Not Available | LEL | UEL |
|--|-----------------------------------|-----|-----|

Extinguishing Media: See Special Fire Fighting Procedure

Special Fire Fighting Procedure: In case of fire in an adjacent area, use water, CO₂ or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products. For bulk quantities of unpackaged cells use LITH-X (Graphite Base). In this case, do not use water.

As with any fire, wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products.

Unusual Fire and Explosion Hazards



Section V – Reactivity Data

| | | | |
|---------------------------------------|----------------|--|--|
| Stability | Unstable | | Conditions to Avoid Do not short circuit, charge or dispose of in fire. |
| | Stable | √ | |
| Incompatibility (Materials to Avoid) | | Hazardous polymerization will not occur. | |
| Hazardous Decomposition or Byproducts | | Not Available | |
| Hazardous Polymerization | May Occur | | Conditions to Avoid |
| | Will Not Occur | √ | |

Section VI – Health Hazard Data

| | | | | | | |
|--|-------------|-----|-------|-----|------------|-----|
| Route(s) of Entry. | Inhalation? | Yes | Skin? | Yes | Ingestion? | Yes |
| Health Hazards (Acute and Chronic) These chemicals are contained in a sealed can. Risk of exposure occurs, only if battery is mechanically or electrically abused. The most likely risk is acute exposure when a cell vents KOH is caustic alkali and attack the skin and eyes. Contact of electrolyte with skin and eyes should be avoided. | | | | | | |

Section VII – Ecological Information

| | | | | | | |
|---|------|--|------------------|---------------|-----------------|---------------|
| Cardnogenicity | NTP? | Not Available | IARC Monographs? | Not Available | OSHA Regulated? | Not Available |
| Signs and Symptoms of Exposure | | KOH can cause chemical burn upon contact with skin. | | | | |
| Medical Conditions Generally Aggravated by Exposure | | An acute exposure will not generally aggravate any medical help. | | | | |

Section VIII – Emergency and First Aid Procedures

In case of skin contact with content of battery, flush immediately with water.
For eye contact, flush with copious amount of water for 10 minutes. If irritation persists, get medical help.

Section IX - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled Wipe out by wet duster.

Section X - Waste Disposal Method

General abandonment

Section XI - Precautions to Be Taken in Handling and Storing

Avoid mechanical or electrical abuse.

Section XII - Other Precautions

Do not short circuit, charge or dispose of in fire. Battery may explode or leak.

Section XIII - Control Measures

| | | | |
|--|----------------------|----------------|----------------|
| Respiratory Protection (Specify Type) | | Not Available | |
| Ventilation | Local Exhaust | Special | Not Available |
| | Mechanical (General) | Other | Not Available |
| Protective Gloves | Butyl | Eye Protection | Safety Glasses |
| Other Protective Clothing or Equipment | | Not Available | |
| Work / Hygienic Practices | | Not Available | |

Section XIV – Regulatory Information

Not Available



Section XV – Other Information

Not Available

Section XVI – Transportation Information

Golden Power batteries are considered to be “dry cell” batteries and are not regulated for purposes of transportation with reference to requirements of

1. U.S. Department of Transportation (DOT), Special Provision 130, i.e. “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)”.
2. International Civil Aviation Administration (ICAO) and International Air Transport Association (IATA), Special Provision A123, i.e. “An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation.”
3. International Maritime Dangerous Goods Regulations (IMDG), Special Provision 304, i.e. “Batteries, dry, containing corrosive electrolyte which will not flow out of the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits.

Examples of such batteries include alkali-manganese, silver oxide, zinc carbon, nickel metal hydride and nickel-cadmium batteries.
