**MSDS**

# MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD-CRYSTAL BATTERY | SEALED AGM | GENERAL VERSION FOR INTERNATIONAL TRADE

**SECTION 1**

## PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **PRODUCT NAME:** | Valve Regulated Sealed Lead Crystal Battery |
| **OTHER PRODUCT NAMES:** | Lead Crystal: Absorbed Electrolyte Sealed;<br>Valve-Regulated Non-Spillable Battery;<br>Battery Non-Spillable 49 CFR 173.159a |
| **MANUFACTURER:** | Betta Batteries International Pty Ltd |
| **ADDRESS:** | Jinxiang Road 225, Pudong New District, Shanghai, China |
| **EMAIL:** | info@bettabatteries.com |
| **EMERGENCY TELEPHONE NUMBERS:** | +27 (0) 113148439 (Africa)<br>+86 (0) 18768209361 (Asia)<br>+61 (0) 738073513 (Australia)<br>+31 (0) 88 0186200 (Europe) |
| **NON-EMERGENCY PHONE NUMBER:** | +86 (0) 18768209361 |
| **CHEMICAL FAMILY:** | This product is an absorbed electrolyte type lead crystal storage battery. |
| **PRODUCT USE:** | Industrial/Commercial electrical storage batteries. |

This product has passed the vibration test, pressure differential test and leakage test at 55°C according to Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations SPECIAL PROVISION 238. It is not restricted to IATA DGR according to Special provision A67 and is not restricted to IMDG CODE according to Special provision 238.

## SECTION 2 HAZARDS IDENTIFICATION

**HAZARD IDENTIFICATION:**

This product has passed the vibration test, pressure differential test and leakage test at 55°C according to Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations SPECIAL PROVISION 238.
It is not restricted to IATA DGR according to Special provision A67 and is not restricted to IMDG CODE according to Special provision 238.

**ADDITIONAL INFORMATION**

No health effects are expected related to normal use of this product as sold

**EMERGENCY OVERVIEW:**

The internal materials may cause severe irritation to eyes/skin, may cause burns.

**SECTION 3**

# COMPOSITION/INFORMATION ON INGREDIENTS

**ADDITIONAL INFORMATION**

The effective components are reflected as a percentage (by Wt) of the finished product. These percentages vary between specific models, therefore a min and max % is given.

/NA: Not applicable
/ND: Not determined

| INGREDIENTS Chemical/Common Names | CAS NUMBER | % by WEIGHT | EC NUMBER |
|---|---|---|---|
| Lead, inorganic | 7439-92-1 | 44-50% | 231-100-4 |
| Lead dioxide | 1309-60-0 | 25-30% | 215-174-5 |
| Sulfuric Acid | 7664-93-9 | 1.75-3% | 231-639-5 |
| Water | 7732-18-5 | 2.8-4.5% | 231-791-2 |
| Silicone dioxide | 7631-86-9 | 1.4-3% | 231-545-4 |
| Chemical additives | /NA | 0.07-0.165% | /NA |
| ABS Shell | 9003-56-9 | 10-24% | /NA |

# SECTION 4 FIRST AID MEASURES

**EYE CONTACT:**

Flush eyes with large amounts of water for at least 10-15 minutes. Seek immediate medical attention if eyes have been exposed directly to acidic electrolyte.

**SKIN CONTACT:**

Flush affected area(s) with large amounts of water using a deluge emergency shower, if available, shower for at least 10-15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.

**INGESTION:**

If swallowed, give large amounts of water. Do NOT induce vomiting since aspiration into the lungs may occur and can cause permanent injury or death.

**INHALATION:**

If breathing difficulties develop, remove person to fresh air. If symptoms persist, seek medical attention

## SECTION 5 FIRE-FIGHTING MEASURES

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Dry chemical, carbon dioxide, water, foam. Do not use water on live electrical circuits.

**SPECIAL FIREFIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:**

Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells. Avoid breathing vapors. Use full protective equipment (bunker gear) and self-contained breathing apparatus.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Batteries may evolve flammable hydrogen gas during (over)charging and may increase fire risk in poorly ventilated areas-near sparks, excessive heat or open flames.

**ADDITIONAL INFORMATION**

Firefighting water runoff may be toxic and may cause environmental impact.

**SPECIFIC HAZARDS IN CASE OF FIRE:**

Thermal shock may cause battery case to crack open. Containers may explode when heated.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

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**PERSONAL PRECAUTIONS:**

Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.

**ENVIRONMENTAL PRECAUTIONS:**

Prevent spilled material from entering sewers and waterways.

**ADDITIONAL INFORMATION**

**Lead Crystal batteries and their plastic cases are recyclable.** Contact your Betta Batteries or authorized distributors for recycling information

**SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:**

Add neutralizer/absorbent to spill area. Sweep or shovel spilled material and absorbent and place in approved container. Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

## SECTION 7 HANDLING AND STORAGE

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**PRECAUTIONS FOR SAFE HANDLING AND STORAGE:**

- Keep containers tightly closed when not in use.
- If battery case is broken, avoid contact with internal components.
- Do not handle near heat, sparks, or open flames.
- Protect containers from physical damage to avoid leaks and spills.
- Place cardboard between layers of stacked batteries to avoid damage and short circuits.
- Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure or fire.

**OTHER PRECAUTIONS (e.g. Incompatibilities):**

Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION:**

Charge in ventilated area.

**VENTILATION:**

General ventilation is acceptable.

**RESPIRATORY PROTECTION:**

Not required for normal conditions of use. See also special firefighting procedures (Section 5).

**EYE PROTECTION:**

Wear protective glasses with side shields or goggles.

**SKIN PROTECTION:**

Wear chemical resistant gloves as a standard procedure to prevent skin contact.

**PROTECTIVE CLOTHING OR EQUIPMENT:**

None required under normal-use conditions for absorbed electrolyte-type batteries.

WASH HANDS AFTER HANDLING.

**ADDITIONAL INFORMATION**

Batteries are housed in ABS cases which are regulated as total dust or respirable dust only when they are ground up during recycling. The OSHA PEL for dust is 15 mg/m$^3$ as total dust or 5 mg/m$^3$ as respirable dust. May be required to meet Domestic Requirements for a Specific Destination(s).

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE:** Industrial/commercial lead crystal battery, Black ABS plastic shell

**ODOR:** Odorless

**PHYSICAL STATE:** Diluted Sulfuric Acid, Crystallized/ Lead, solid

**pH:** 1-2

**ODOR THRESHOLD:** NA

**MELTING POINT:** 300°C

**FREEZING POINT:** NA

**VAPOUR PRESSURE:** NA

**VAPOUR DENSITY (AIR = 1):** NA

**SPECIFIC GRAVITY (H2O = 1):** 1.27

**EVAPORATION RATE (n-BuAc=1):** NA

**SOLUBILITY IN WATER:** 100% (as diluted sulfuric acid)

**FLASH POINT:** Below room temperature (as hydrogen gas)

**AUTO-IGNITION TEMPERATURE:** NA

**LOWER EXPLOSIVE LIMIT (LEL):** 4% (as hydrogen gas)

**UPPER EXPLOSIVE LIMIT (UEL):** 74% (as hydrogen gas)

**PARTITION COEFFICIENT:** NA

**VISCOSITY (POISE @ 25°C):** NA

**DECOMPOSITION TEMPERATURE:** NA

## **SECTION 10** STABILITY AND REACTIVITY

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**INCOMPATIBILITY (MATERIAL TO AVOID):**

This product is stable under normal conditions at ambient temperature up to 65°C.Strong bases, combustible organic materials, reducing agents, finely divided metals and strong oxidizers.

**HAZARDOUS DECOMPOSITION OR BY PRODUCTS:**

Thermal decomposition will produce sulfur dioxide, sulfur trioxide, carbon monoxide, sulfuric acid mist, and hydrogen.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

**CONDITIONS TO AVOID:**

Continuous overcharging and sources of ignition.

## **SECTION 11** TOXICOLOGICAL INFORMATION

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ACUTE TOXICITY (Test Results Basis and Comments):

**TOXICITY DATA:**

Not available

**IRRITATION DATA:**

The internal battery materials may cause severe irritation to eyes/skin and may cause burns.

**CARCINOGENICITY:**

The international agency on cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a category 1 carcinogen (inhalation), a substance that is carcinogenic to humans. This classification does not apply to the diluted sulfuric acid contained within the lead crystal batteries. Misuse of the product such as constant overcharging may result in the generation of sulfuric acid mist.

## SECTION 12 ECOLOGICAL INFORMATION

**PERSISTENCE & DEGRADABILITY:**

Lead is very persistent in soils and sediments. No data available on biodegradation.

**BIOACCUMULATIVE POTENTIAL (INCLUDING MOBILITY):**

Mobility of metallic lead between ecological compartments is low. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants, but very little bioaccumulation occurs through the food chain. Most studies have included lead compounds, not solid inorganic lead.

**AQUATIC TOXICITY (TEST RESULTS & COMMENTS):**

24-hour LC50, fresh water fish (Brachydanio rerio): 82 mg/l
96-hour LOEC, fresh water fish (Cyprinus carpio): 22 mg/l (lowest observable effect concentration)
Lead (metal) No data available.

**ADDITIONAL INFORMATION**

No known effects on stratospheric ozone depletion.
Volatile organic compounds: 0% (by Volume)
Water Endangering Class (WGK): NA

## SECTION 13 DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:**

Lead crystal batteries are recyclable when sent to a secondary lead smelter. Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

**HAZARDOUS WASTE CLASS/CODE:**

US - Not applicable to finished product as manufactured for distribution into commerce.
CN - Not applicable to finished product as manufactured for distribution into commerce.
EWC - Not applicable to finished product as manufactured for distribution into commerce.

**NOT INCLUDED**

Recycle or dispose as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

## SECTION 14 TRANSPORT INFORMATION

This product has passed the vibration test, pressure differential test and leakage test at 55°C according to Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations SPECIAL PROVISION 238. The product complies with IATA 57th Edition regulations for Dangerous Goods.

**ADDITIONAL INFORMATION**

Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped. Origin/destination/customs points as-shipped. Each battery and the outer packaging must be plainly and durably marked "Non-spillable" or "Non-spillable Battery"

**AIRCRAFT – ICAO-IATA:**
Not regulated as a Hazardous Material, transported as normal goods

**VESSEL – IMO-IMDG:**
Not regulated as a Hazardous Material, transported as normal goods

## SECTION 15 REGULATORY INFORMATION

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**CHEMICAL CAS #:** None NA

**CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)**
Chemicals present in the product which could require reporting under the statute:
Chemical CAS #: Lead 7439-92-1 Sulfuric acid 7664-93-9

**SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**
The finished product contains chemicals subject to the reporting requirements of Section 313 of SARA Title III.

| CHEMICAL | CAS# | % WT |
|---|---|---|
| Lead | 7439-92-1 | 60-75% |
| Diluted Sulfuric Acid | 7664-93-9 | 1.75-3% |

**CERCLA SECTION 311/312 HAZARD CATEGORIES:** Note that the finished product is exempt from these regulations, but lead and sulfuric acid above the thresholds are reportable on Tier II reports.

**ADDITIONAL INFORMATION**
This product may be subject to Restriction of Hazardous Substances (RoHS) regulations, or may be regulated under additional regulations and laws not identified above, such as for uses other than described or as-designed/as intended by the manufacturer, or for distribution into specific domestic destinations.

**FIRE HAZARD** No
**PRESSURE HAZARD** No
**REACTIVITY HAZARD** No
**IMMEDIATE HAZARD** Yes (Internal acid gel is Corrosive)
**DELAYED HAZARD** No
Sulfuric Acid is regulated as an Extremely Hazardous Substance

**European Inventory of Existing Commercial Chemical Substances (EINECS)**
All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

**European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC. R-Phrases S-Phrases 36, 37.**

## SECTION 16 OTHER INFORMATION

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**OTHER INFORMATION:**

Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

**SOURCES OF INFORMATION:**

International Agency for Research on Cancer (1987), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France. Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents. RTECS — Registry of Toxic Effects of Chemical Substances, National institute for Occupational Safety and Health.

## MSDS/SDS PREPARATION INFORMATION

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