| SEBANG 세방전지(주) | Material Safety Data sheet (MSDS) | Control No. | |
|---|---|---|---|
| | | Date First | May 16, 2008 |
| | | Date Final | January 1, 2026 |

MSDS Number : AA02158-0000000002

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

A. PRODUCT NAME : Lead-acid Battery

B. RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE

: Lead-acid Batteries for Marine

C. MANUFACTURER/SUPPLIER/DISTRIBUTOR INFORMATION

MANUFACTURER : Sebang Global Battery CO.,Ltd.

Sonjae-ro 287beon-gil, Gwangsan-Gu, Gwangju, KOREA

TEL: +82-62-601-6128 FAX: +82-62-951-4126

## 2. HAZARDS IDENTIFICATION

A. HAZARD CLASSIFICATION

PHYSICAL HAZARDS

: Not Classified.

HEALTH HAZARDS

| | | |
|---|---|---|
| : | Acute toxicity | Category 2 (inhalation) |
| : | Skin corrosion/irritation | Category 1 |
| : | Serious eye damage/eye irritation | Category 1 |
| : | Carcinogenicity | Category 1B |
| : | Germ cell mutagenicity | Category 2 |
| : | Specific target organ toxicity – single exposure | Category 1 |
| : | Specific target organ toxicity – repeated exposure | Category 1 |
| : | Hazardous to the aquatic environment_Acute hazard | Category 1 |
| : | Hazardous to the aquatic environment_Chronic hazard | Category 1 |

ENVIRONMENTAL HAZARDS

: Not Classified.

B. GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

PICTOGRAMS :



SIGNAL WORD : DANGER.

HAZARD STATEMENTS

| | |
|---|---|
| H332 | Harmful if inhaled. |
| H314 | Causes severe skin burns and eye damage. |
| H318 | Causes serious eye damage. |
| H350 | May cause cancer (inhalation). |
| H341 | Suspected of causing genetic defects. |

| | |
|---|---|
| H370 | Specific target organ toxicity – single exposure; Respiratory tract irritation |
| H372 | Causes damage to organs (Hematopoietic system, kidney, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory). |
| H400 | Very toxic to aquatic life |
| H410 | Very toxic to aquatic life with long lasting effects |

PRECAUTIONARY STATEMENTS :

[Prevention]

| | |
|---|---|
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray. |
| P271 | Use only outdoors or in a wellventilated area. |
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P264 | Wash hands thoroughly after handling. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P201 | Obtain special instructions before use. |
| P202 | Do not handle until all safety precautions have been read and understood. |
| P281 | Use personal protective equipment as required. |
| P270 | Do not eat, drink or smoke when using this product. |

[Response]

| | |
|---|---|
| P304 + P340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P312 | Call a POISON CENTER or doctor/physician if you feel unwell. |
| P301+P330+P331 | IF SWALLOWED: rinse mouth. Do NOT induce vomiting. |
| P303 + P361 + P353 | IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. |
| P363 | Wash contaminated clothing before reuse. |
| P310 | Immediately call a POISON CENTER or doctor/physician. |
| P321 | Specific treatment (see ... on this label). |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P308 + P313 | IF exposed or concerned: Get medical advice/attention. |
| P307+P311 | IF exposed: Call a POISON CENTER or doctor/physician. |
| P314 | Get medical advice/attention if you feel unwell. |

[Storage]

| | |
|---|---|
| P405 | Store locked up. |

[Disposal]

| | |
|---|---|
| P501 | Dispose of contents/container in accordance with local/regional/national regulations. |

C. OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION (e.g. Dust explosion hazards)

NFPA/HMIS Rating

: Health=3, Flammability=0, Instability=1
(0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme)

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| Chemical name / Synonym | CAS No. or ID | Content (%) |
|---|---|---|
| Lead | 7439-92-1 | 52 - 59 |
| Antimony | 7440-36-0 | 0.5 - 0.7 |
| Sulfuric acid / Oil of vitriol | 7664-93-9 | 30 - 38 |
| Polypropylene / PP Resin | 9003-07-0 | 6 - 9 |
| Separator | Not available | 1 - 2 |

* European Inventory of Existing Commercial Chemical Substances (EINECS).

## 4. FIRST AID MEASURES

A. EYE CONTACT : If a battery ruptures, do not rub or scratch exposed eye. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. GET MEDICAL ATTENTION IMMEDIATELY.

B. SKIN CONTACT : If a battery ruptures, do not rub or scratch exposed skin. If liquid get on the skin, immediately flush the contaminated skin with water for at least 15 minutes. If liquid penetrate through the clothing, immediately remove the clothing and shoes under a safety shower and continue to wash the skin for at least 15 minutes. GET MEDICAL ATTENTION IMMEDIATELY.

C. INHALATION : If a battery ruptures, move to fresh air in case of accidental inhalation of mist. If breathing has stopped, perform artificial respiration. If breathing is difficult, give oxygen. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

D. INGESTION : If solutions of a battery chemicals have been swallowed and the person is conscious, give one glass of water. Vomiting may occur spontaneously, but Do NOT induce vomiting. Never give anything by mouth to an unconscious person. GET MEDICAL ATTENTION IMMEDIATELY.

E. MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE OR DELAYED

EYES : Not a likely route of exposure. If a battery ruptures, direct contact with the liquid or exposure to vapors or mists may cause tearing, redness, swelling, corneal damage and irreversible eye damage. Splashes in the eyes will cause severe burns.

SKIN : Not a likely route of exposure. Direct contact with internal components of a battery can be severely irritating to the skin and may result in redness, swelling, burns and severe skin damage. Skin contact may aggravate an existing dermatitis condition.

INHALATION : Not a likely route of exposure. If a battery ruptures, may be harmful or fatal if inhaled in a confined area. May cause severe irritation and burns of the nose, throat and respiratory tract.

INGESTION : Not a likely route of exposure. Causes serious burns of the mouth or perforation of the esophagus or stomach. May be fatal if swallowed.

* Lead may causes toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to lead can produce target organs damage.

F. INDICATION OF IMMEDIATE MEDICAL ATTENTION AND NOTES FOR PHYSICIAN

: Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

## 5. FIRE FIGHTING MEASURES

A. SUITABLE (AND UNSUITABLE) EXTINGUISHING MEDIA

: Use extinguishing media appropriate for surrounding fire.
If a battery ruptures, use dry chemical, soda ash, lime, sand or carbon dioxide.

B. SPECIFIC HAZARDS ARISING FROM THE CHEMICAL

: Lead, lead compounds and sulfuric acid fume may be released during a fire involving the product.

C. SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS

: Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing.

D. FIRE AND EXPLOSION HAZARD

: Not flammable.
Battery may rupture due to pressure buildup when exposed to excessive heat and may be result in the release of corrosive materials.

## 6. ACCIDENTAL RELEASE MEASURES

A. NECESSARY MEASURES AND PROTECTIVE GEAR TO PROTECT HUMANS

: If a battery ruptures, avoid contact with skin, eyes and clothing. Do not touch spilled material. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

B. NECESSARY MEASURES TO PROTECT ENVIRONMENT

: Notify authorities and appropriate federal, state, and local agencies. Prevent the product from spreading into the environment. Avoid direct discharge into drains.

C. METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

: SMALL SPILLS: Collect all released material in a plastic lined metal container. If necessary neutralize the residue with a dilute solution of sodium carbonate. Wash affected area.
LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by building a dike. Absorb with dry earth, sand or other non-combustible material. Neutralize the residue with a dilute solution of sodium carbonate. Dispose of all contaminated materials in accordance with current local regulations.

## 7. HANDLING AND STORAGE

A. PRECAUTIONS FOR SAFE HANDLING

: Protect from physical damage.

B. CONDITIONS FOR SAFE STORAGE (INCLUDING ANY INCOMPATIBILITIES)

: Avoid contact with eyes. Store in a cool, dry, ventilated area away from sources of heat, moisture, incompatibilities, and direct sunlight. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. OCCUPATIONAL EXPOSURE LIMIT(S), BIOLOGICAL EXPOSURE STANDARD

| | |
|---|---|
| OSHA-PEL | 0.05 mg/m3 (Lead), 1 mg/m3 (Sulfuric acid), 0.5 mg/m3 (Antimony) |
| ACGIH-TLV | TWA 0.05 mg/m3 (Lead), TWA 0.2 mg/m3 (Sulfuric acid)<br>TWA 0.5 mg/m3(Antimony) |

B. APPROPRIATE ENGINEERING CONTROLS

: Use local exhaust ventilation if necessary to control airborne mist and vapor.

C. INDIVIDUAL PROTECTION MEASURES

| | | |
|---|---|---|
| Respiratory protection | : | If significant mists or aerosols are generated an approved respirator is recommended. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. |
| Eye protection | : | Wear safety glasses with side shields (or goggles). |
| Hand protection | : | Wear chemical resistant gloves. Gloves should be replaced immediately if signs of degradation are observed. |
| Body protection | : | Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| A. APPEARANCE (PHYSICAL STATE, COLOUR etc.) | : | Off-white cloudy liquid with solid object. |
| B. Odour | : | Characteristics. |
| C. ODOR THRESHOLD | : | Not available. |
| D. pH | : | pH < 1 (Sulfuric acid) |
| E. MELTING POINT/FREEZING POINT | : | Not available. |
| F. INITIAL BOILING POINT AND BOILING RANGE | : | Not available. |
| G. FLASH POINT | : | Non-flammable. |
| H. EVAPORATION RATE | : | Not available. |
| I. FLAMMABILITY (SOLID, GAS) | : | Not applicable. |

J. UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS

: Non-flammable.

K. VAPOR PRESSURE : Not available.

L. SOLUBILITY : Soluble in water.
M. VAPOR DENSITY : Not available.
N. SPECIFIC GRAVITY : Not available.
O. PARTITION COEFFICIENT OF n-OCTANOL/WATE : Not available.
P. AUTO-IGNITION TEMPERATURE : Not applicable.
Q. DECOMPOSITION TEMPERATURE : Not available.
R. VISCOSITY : Not available.
S. MOLECULAR WEIGHT : Mixture.

**Note: These physical properties are typical values for this product.**

A. APPEARANCE (PHYSICAL STATE, COLOUR etc.) : Bluish white, silvery gray.
B. Odour : None.
C. ODOR THRESHOLD : Not available.
D. pH : Not applicable.
E. MELTING POINT/FREEZING POINT : 327.5℃
F. INITIAL BOILING POINT AND BOILING RANGE : 1740℃ (1013 hPa)
G. FLASH POINT : Non-flammable.
H. EVAPORATION RATE : Not applicable.
I. FLAMMABILITY (SOLID, GAS) : Not applicable.
J. UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS : Non-flammable.
K. VAPOR PRESSURE : 1.33 hPa (973℃)
L. SOLUBILITY : Insoluble in water.
M. VAPOR DENSITY : Not applicable.
N. SPECIFIC GRAVITY : 11.34 g/cm3
O. PARTITION COEFFICIENT OF n-OCTANOL/WATE : Not applicable.
P. AUTO-IGNITION TEMPERATURE : Not applicable.
Q. DECOMPOSITION TEMPERATURE : Not applicable.
R. VISCOSITY : Not applicable.
S. MOLECULAR WEIGHT : 207.2

**Note: These physical properties are typical values for Lead(Pb).**

## 10. STABILITY AND REACTIVITY

A. CHEMICAL STABILIT : Stable at normal temperatures and storage conditions.
B. POSSIBILITY OF HAZARDOUS REACTIONS : Hazardous polymerization will not occur.
C. CONDITIONS TO AVOID (STATIC DISCHARGE, SHOCK, VIBRATION etc.): : Overcharging. Sources of ignition. Mechanical impact. Contact with incompatible chemicals.
D. SUBSTANCES TO AVOID

: If a battery ruptures, avoid contact with organic materials and alkaline materials.

E. HAZARDOUS DECOMPOSITION PRODUCTS

: Lead, Lead compounds and sulfuric acid fumes may be released during a fire involving the product.

## 11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

Inhalation : Corrosive. severe irritation and burns.

Ingestion : Serious burns.

Eye/Skin

Eye : Tearing, redness, swelling, corneal damage, irreversible eye damage and severe burns.

Skin : Redness, swelling, burns and severe skin damage.

B. Delayed and immediate effects and also chronic effects from short and long term exposure

Acute toxicity (possible route of exposure) :

Oral (LD50) : Rat 2140 mg/kg (Sulfuric acid), 7000 mg/kg (Antimony)

Skin (LD50) : Not available.

Inhalation (LC50) : Rat 0.347 mg/L(4hr) (dust//mist)

Skin corrosion/irritation : cat 1

Serious eye damage/irritation : cat 1

Respiratory sensitization : Not available.

Skin sensitization : Not available.

Carcinogenicity : cat 1B

ACGIH Group A2, IARC Group 1 (Mist containing sulfuric acid)
* Note: Sulfuric acid mist is not expected under normal use of the product.
ACGIH Group A3, IARC Group 2B (Lead), IARC Group 3 (Polypropylene)

Germ cell mutagenicity : cat 2

Reproductive toxicity : Not available.

STOST-single exposure : cat 1

: Respiratory.

STOST-repeated exposure : cat 1

: Hematopoietic system, kidney, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory.

Aspiration hazard : Not available.

C. Numeric measure of toxicity (such as acute toxicity estimates) - ATEmix

Oral (LD50) : Rat > 5,000 mg/kg

Skin (LD50) : Not available.

Inhalation (LC50) : Rat 2.51 mg/L(4hr) (dust//mist)

## 12. ECOLOGICAL INFORMATION

A. Aquatic/terrestrial ecology toxicity

Fish (LC50)

| | | |
|---|---|---|
| Lead | : | LC50 2.2 ㎎/ℓ 96 hr |
| Sulfuric acid | : | LC50 16 ㎎/ℓ 96 hr |
| Antimony | : | LC50 5.2 ㎎/ℓ 96 hr |

Daphnia (EC50)

| | | |
|---|---|---|
| Lead | : | Not available. |
| Sulfuric acid | : | EC50 200 ㎎/ℓ 48 hr |
| Antimony | : | Not available. |

Algae (EC50) : Not available.

B. Persistence and degradability

Persistence

| | | |
|---|---|---|
| Lead | : | log kow 2.98 |
| Sulfuric acid | : | log kow -1.43 |
| Antimony | : | log kow 0.73 |

Degradability : Not available.

C. Bioaccumulative potential

| | | |
|---|---|---|
| Lead | : | Not available. |
| Sulfuric acid | : | BCF 250 |
| Antimony | : | Not available. |

D. Mobility in soil : Not available.

E. Other hazardous effects : Not available.

## 13. DISPOSAL CONSIDERATIONS

A. DISPOSAL METHODS

: Dispose of in accordance with local, state, and federal regulations. Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

B. PRECAUTIONS (INCLUDING DISPOSAL OF CONTAMINATED CONTAINER OR PACKAGE)

: Since emptied containers retain product residue, follow label warnings even after container is emptied.

## 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (BL). Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation.

A. UN NUMBER : UN 2794

B. UN PROPER SHIPPING NAME

BATTERIES, WET, FILLED WITH ACID, electric storage.

C. TRANSPORT HAZARD CLASS(ES) : 8

D. PACKING GROUP (IF APPLICABLE) : None.

E. MARINE POLLUTANT SUBSTANCES (APPLICABLE/NOT APPLICABLE)

: Not Applicable.

F. SPECIAL PRECAUTIONS FOR USER : Not available.

## 15. REGULATORY INFORMATION

₪ INVENTORIES

EINECS/EU : Listed (EINECS No. 231-100-4(Lead), 231-639-5(Sulfuric acid))

TSCA/US : Listed.

ENCS/JAPAN : Listed (ENCS No. 1-527(Lead), 1-430(Sulfuric acid))

AICS/AUSTRALIA : Listed.

DSL/CANADA : Listed.

IECSC/CHINA : Listed.

PICCS/PHILIPPINES : Listed.

KECI/S.KOREA : Listed (KE-21887(Lead), KE-32570(Sulfuric acid))

₪ International Environmental Agreement

PIC : Not listed.

POPs : Not listed.

Ozone depletion : Not listed.

EU. Directive 67/548/EEC on the classification, packaging, and labelling of dangerous substances, Annex I

Classification : C; R35

Risk Phrases : R35

Safety Phrases : S1/2, S26, S30, S45

₪ U.S. Federal, Heanth and Environment) and U.S. Federal, Right-To-Know

CERCLA Section 103 (40 CFR 302.4)

: 10lb (4.535 kg) (Lead), 1000 lb (453.599 kg) (Sulfuric acid)

EPCRA (SARA Title III) Section 302 (EHS -TPQ)

: 1000 lb (453.599 kg) (Sulfuric acid)

EPCRA (SARA Title III) Section 304 (EHS - Reporting Quantities)

: 1000 lb (453.599 kg) (Sulfuric acid)

EPCRA (SARA Title III) Section 313 - Toxic chemical release reporting

: Sulfuric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)

OSHA Specifically Regulated Substances (29 CFR 1910.1001-.1052)

: Not applicable.

₪ CANADA REGULATORY INFORMATION

WHMIS Ingredient Disclosure List : Regulated.

NOTE: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

## 16. OTHER INFORMATION

A. SOURCE OF DATA :

Guideline for Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

EC-ECB, International Uniform Chemical Information Database (IUCLID)

Hazardous Substances Data Bank (HSDB)

Registry of Toxic Effects of Chemical Substances (RTECS)

National Institute of Technology and Evaluatio -NITE (Japan).

NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response.

International Chemical Safety Cards(ICSC)(http://www.nihs.go.jp/ICSC)

3E Company/Ariel WebInsight DB.

B. THE DATE OF PREPARATION OF THE MSDS : May 16, 2008

C. THE DATE OF PREPARATION OF THE LATEST REVISION

: January 1, 2026

D. OTHER INFORMATIC :

The above information is believed to be correct but does not propose to be all inclusive and shall be used only as a guide. Sebang Global Battery CO.,Ltd. shall not be held liable for any damage resulting from handling or from contact with the above product. Each individual should make a determination as to the suitability of the information for their particular purpose(s). Various government agencies may have specific regulations regarding the transportation, handling, storage, use, or disposal of this product which may not be covered by this MSDS. The user is responsible for full compliance.

Support on preparation of the GHS-MSDS: RGB Chemicals Co.,Ltd. +82-2-597-0645