



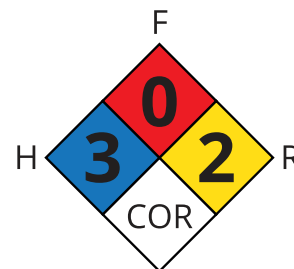
# Safety Data Sheet

## Fullriver Battery

Valve Regulated Lead Acid (VRLA) Battery

3823 Mission Oaks Blvd, Suite A, Camarillo, CA 93012  
800-522-8191 | 805-484-7900 | fullriverbattery.com

## Hazard Rating



### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

|                              |   |
|------------------------------|---|
| Product Name                 | Valve Regulated Sealed Non-Spillable Lead Acid Battery                              |
| Common Name                  | Valve Regulated Sealed Non-Spillable Lead Acid Battery                              |
| Trade Names & Synonyms       | VRB, VRLA, SLAB, Recombinant Lead Acid: DC, FT, FFD Series                          |
| Product Use                  | Electric Storage Battery  |
| UN / DG Class                | UN2800, Non-DG  |
| Manufacturer's Name          | Fullriver Battery Manufacture Co. Ltd.  |
| Address                      | P.O. Box 511475, Taishi Industrial Area, Yuwotou Town, Panyu Zone, Guangzhou, China |
| U.S. Address                 | 3823 Mission Oaks Blvd, Suite A, Camarillo, CA 93012, U.S.A.                        |
| Phone                        | 800-522-8191 (Toll Free)   805-484-7900 (International)                             |
| Emergency Contact            | CHEMTREC 800-424-9300   |
| Person Responsible for Prep. | Aaron Plew, Director of Product Management  |
| Revised Date                 | January 1, 2025   |

Common Name: (Used on label) Valve Regulated Sealed Non-Spillable Lead Acid Battery  
(Trade Names & Synonyms) VRB, VRLA, SLAB, Recombinant Lead Acid: DC, FT, FFD Series

### Section 2 - HAZARD IDENTIFICATION

|  |                            |
|--|----------------------------|
| Acute Toxicity (oral, dermal, inhalation)          | Category 4                 |
| Skin Corrosion / Irritation                        | Category 1A                |
| Serious Eye Damage / Eye Irritation                | Category 1                 |
| Reproductive Toxicity                              | Category 1A                |
| Carcinogenicity (lead & acid mist)                 | Category 1B                |
| Specific Target Organ Toxicity (repeated exposure) | Category 2                 |
| Environmental Hazards to the Aquatic Community     | Acute & Chronic Category 1 |
| Physical Hazards (Flammable Gases)                 | Category 1A                |
| Physical Hazards (Explosives)                      | Division 1.3               |

**Health****Hazard Statements****DANGER!**

## Normal Operating Conditions

- **H350:** May cause cancer if ingested or inhaled
- **H360:** May damage fertility or the unborn child if ingested or inhaled
- **H373:** May cause damage to organs (central nervous system, blood, kidneys) through prolonged or repeated exposure
- **H410:** Very toxic to aquatic life with long-lasting effects

## Abnormal Conditions (broken case or extreme overcharging)

- **H312:** Harmful in contact with skin
- **H302:** Harmful if swallowed
- **H332:** Harmful if inhaled
- **H314:** Causes severe skin burns and eye damage
- **H318:** Causes serious eye damage
- **H220:** Extremely flammable gas (hydrogen)
- **H203:** Explosive; fire, blast or projection hazard

**Environmental****Precautionary Statements**

## Prevention:

- **P201:** Obtain special instructions before use
- **P202:** Do not handle until all safety precautions have been read and understood
- **P280:** Wear protective gloves/protective clothing/eye protection/face protection
- **P210:** Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- **P261:** Avoid breathing dust/fume/gas/mist/vapors/spray
- **P264:** Wash thoroughly after handling
- **P270:** Do not eat, drink or smoke when using this product
- **P271:** Use only outdoors or in a well-ventilated area
- **P273:** Avoid release to the environment

## Response:

- **P301+P312:** IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell
- **P302+P352:** IF ON SKIN: Wash with plenty of water
- **P304+P340:** IF INHALED: Remove person to fresh air and keep comfortable for breathing
- **P305+P351+P338:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- **P310:** Immediately call a POISON CENTER/doctor
- **P321:** Specific treatment (see supplemental first aid information on this label)
- **P363:** Wash contaminated clothing before reuse

## Storage:

- **P405:** Store locked up
- **P403:** Store in a well-ventilated place
- **P410:** Protect from sunlight
- **P235:** Keep cool

## Disposal:

- **P501:** Dispose of contents/container in accordance with local/regional/national/international regulations

## Section 3 - COMPOSITION/INFORMATION ON INGREDIENTS

| C.A.S.    | Principal Hazardous Components<br>(chemical & common name) | Hazard Category                   | % Weight | ACGIH<br>TLV           | OSHA<br>PEL / TWA      |
|-----------|--|-----------------------------------|----------|------------------------|------------------------|
| 7439-92-1 | Lead   | Acute-Chronic                     | 60-70    | 0.05 mg/m <sup>3</sup> | 0.05 mg/m <sup>3</sup> |
| 7440-70-2 | Lead Oxide (Litharge)                                      | Reactive                          | 60-70    | 0.05 mg/m <sup>3</sup> | 0.05 mg/m <sup>3</sup> |
| 7440-31-5 | Lead Sulfate   | Chronic                           | 60-70    | 0.05 mg/m <sup>3</sup> | 0.05 mg/m <sup>3</sup> |
| 7664-93-9 | Sulfuric Acid (battery electrolyte)                        | Reactive-Oxidizer / Acute-Chronic | 10-15    | 1.0                    | 1.0                    |
|           | Calcium  |                                   | < 0.15   | Not Established        | Not Established        |
|           | Tin  |                                   | < 1      | 2                      | 2                      |

NOTE: PEL's for individual states may differ from OSHA's PEL's. Check with local authorities for the applicable state PELs.

OSHA - Occupational Safety and Health Administration  
ACGIH - American Conference of Governmental Industrial Hygienists  
NIOSH - National Institute for Occupational Safety and Health

## Section 4 - FIRST AID MEASURES

### Emergency & First Aid Procedures

| Exposure Route    | Sulfuric Acid  | Lead   |
|-------------------|--|--|
| Inhalation        | Remove from exposure, gargle, wash nose and lips and obtain medical attention.   | Remove to fresh air and provide medical oxygen and CPR if needed. Obtain medical attention.  |
| Ingestion         | DO NOT induce vomiting. If conscious, rinse mouth and drink water if able to swallow. Obtain medical attention immediately. Never give anything by mouth to an unconscious person. | DO NOT induce vomiting. If conscious, drink large amounts of water. Obtain medical attention immediately. Never give anything by mouth to an unconscious person. |
| Contact with Skin | Wash immediately with soap and water for at least 15 minutes. Remove contaminated clothing. Obtain medical attention.  | Flush contacted area with large amounts of water for 15 minutes. Remove contaminated clothing and obtain medical attention if necessary.                         |
| Contact with Eyes | Hold eyelids open and immediately flush with large amounts of water for at least 15 minutes. Obtain medical attention.   | Hold eyelids open and immediately flush with large amounts of water for at least 15 minutes. Obtain medical attention.   |

#### Most Important Symptoms and Effects, Both Acute and Delayed

**Acute:** Severe skin burns, eye damage, respiratory irritation, nausea, vomiting, abdominal pain

**Delayed:** Central nervous system damage, kidney damage, reproductive effects, cancer

#### Indication of Any Immediate Medical Attention and Special Treatment Needed

Treat symptomatically. In case of skin or eye contact with sulfuric acid, immediate medical attention is required. For lead exposure, blood lead level monitoring may be necessary.

## Section 5 - FIREFIGHTING MEASURES

**Flash Point:** Not Applicable

**Flammable Limits in Air % by Volume:** LEL: 4% (Hydrogen), UEL: 75% (Hydrogen)

**Auto-Ignition Temperature:** 675°F (polypropylene); 1085°F (Hydrogen)

#### Extinguishing Media:

- **Suitable:** Class ABC dry chemical, CO<sub>2</sub>, foam, water fog. Do not use carbon dioxide directly on cells.
- **Unsuitable:** Do not use water jet directly on batteries. Avoid breathing vapors.

## Fire Fighting Procedures

Lead/acid batteries do not burn or burn with difficulty. Do not use water on fires where molten metal is present. Extinguish fire with agent suitable for surrounding combustible materials. Cool exterior of battery if exposed to fire to prevent rupture. The acid mist and vapors generated by heat or fire are corrosive. Use NIOSH approved self-contained breathing apparatus (SCBA) and full protective equipment operated in positive-pressure mode.

## Unusual Fire and Explosion Hazards

**During charging and operation:** Small amounts of highly flammable hydrogen gas may be generated during charging and operation of batteries. Hydrogen forms explosive mixtures with air. Avoid open flames, sparks and other sources of ignition near batteries.

**Short circuit hazard:** Do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery, as a short circuit will cause high current flow, create heat and the possibility of fire or explosion. Overcharge conditions: Overcharging can cause excessive hydrogen gas generation and potential battery rupture.

## Hazardous Combustion Products

Sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), sulfur trioxide (SO<sub>3</sub>), hydrogen sulfide (H<sub>2</sub>S), and sulfuric acid mist. Sulfuric acid vapors are generated upon overcharge and polypropylene case failure. Lead oxide fumes may be released.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### Personal Precautions, Protective Equipment and Emergency Procedures

**For non-emergency personnel:** Evacuate area. Ensure adequate ventilation. Avoid contact with spilled material, dust, and vapors. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**For emergency responders:** Use personal protective equipment as required. See Section 8 for additional information.

### Environmental Precautions

Lead (and its compounds) and sulfuric acid can pose a severe threat to the environment. Prevent entry into waterways, sewers, basements or confined areas. The contamination of water, soil and air should be prevented. Notify authorities if product enters waterways or sewers.

### Methods and Materials for Containment and Cleaning Up

**Small spills:** Avoid contact with any spilled material. Contain spill and isolate hazard area. Neutralize acid with sodium bicarbonate, soda ash, lime or other suitable neutralizing agent. Absorb with inert material. Place battery in suitable container for disposal.



**Large spills:** Deny entry to unauthorized personnel. Limit site access to emergency responders. Contain spill. Neutralize with sodium bicarbonate, soda ash, lime or other neutralizing agent. Collect for proper disposal.

**Cleanup:** Dispose of contents/container in accordance with local, regional, national and international regulations. Sodium bicarbonate, soda ash, sand, lime or other neutralizing agent should be kept on-site for spill remediation.

### **Protective Equipment**

Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side/face shields. Acid/vapor respirator if ventilation is inadequate. Acid-resistant gloves (rubber or neoprene).

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## **Section 7 - HANDLING AND STORAGE**

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### **Precautions for Safe Handling**

Store away from reactive materials, open flames and sources of ignition as defined in Section 10 - Stability and Reactivity Data. Avoid damage to containers. Do not allow the positive and negative terminals to contact each other or a short circuit will cause high current flow, creating high heat and the possibility of a fire.

### **Good personal hygiene and work practices are mandatory:**

- Refrain from eating, drinking or smoking in work areas
- Thoroughly wash hands, face, neck and arms before eating, drinking or smoking
- Work clothes and equipment should remain in designated lead contaminated areas, and never taken home or laundered with personal clothing
- Wash soiled clothing, work clothes and equipment before reuse

### **Conditions for Safe Storage**

Store batteries in cool, dry, well-ventilated areas. Batteries should be stored under roof for protection against adverse weather conditions. Keep away from heat, sparks, open flames, and hot surfaces. Store in a well-ventilated place. Keep container tightly closed. Store locked up.

**Storage temperature:** Store in ambient conditions, avoid temperature extremes

**Incompatible materials:** Keep away from strong oxidizers, strong acids, strong bases, and reactive metals

### **Specific End Use(s)**

Electric storage battery for various applications including telecommunications, UPS systems, renewable energy storage, and other stationary applications.

### **Precautions During Charging**

Use proper voltages during charging (see battery documentation). Never use a battery that has less than 80% of rated capacity. Charge at constant potential (voltage) only. For optimum life, battery charge voltage should be adjusted with the battery operating temperature. Ensure adequate ventilation during charging to prevent hydrogen gas accumulation. Never charge in a sealed enclosure without ventilation.

## Section 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

| C.A.S.    | Chemical Name                | ACGIH TLV                    | OSHA PEL                     | NIOSH REL                    |
|-----------|------------------------------|------------------------------|------------------------------|------------------------------|
| 7439-92-1 | Lead and Inorganic Compounds | 0.05 mg/m <sup>3</sup> (TWA) | 0.05 mg/m <sup>3</sup> (TWA) | 0.05 mg/m <sup>3</sup> (TWA) |
| 7664-93-9 | Sulfuric Acid                | 0.2 mg/m <sup>3</sup> (TWA)  | 1 mg/m <sup>3</sup> (TWA)    | 1 mg/m <sup>3</sup> (TWA)    |
| 7440-31-5 | Tin (inorganic compounds)    | 2 mg/m <sup>3</sup> (TWA)    | 2 mg/m <sup>3</sup> (TWA)    | 2 mg/m <sup>3</sup> (TWA)    |

**NOTE:** PEL's for individual states may differ from OSHA's PEL's. Check with local authorities for the applicable state PELs.

OSHA - Occupational Safety and Health Administration  
ACGIH - American Conference of Governmental Industrial Hygienists  
NIOSH - National Institute for Occupational Safety and Health

### Appropriate Engineering Controls

**Ventilation:** Store and handle in dry, ventilated area. If mechanical ventilation is used, components must be acid resistant. Local exhaust ventilation or other engineering controls should be used to keep airborne concentrations below recommended exposure limits. Ensure adequate ventilation during charging operations.

**Other controls:** Provide eyewash stations and safety showers in work areas. Implement lead hygiene program where exposure may occur.

### Individual Protection Measures

**Respiratory Protection:** None required under normal conditions with adequate ventilation. Acid/gas NIOSH approved respirator (such as N95 or P100 for lead dust, or organic vapor/acid gas cartridge respirator) is required when PEL is exceeded or employee experiences respiratory irritation. Use NIOSH-approved respirator for lead exposure when engineering controls are not feasible.

**Eye Protection:** ANSI Z87.1 approved safety glasses with side shields recommended at minimum. Chemical splash goggles and face shield recommended when there is potential for contact with battery acid or during maintenance activities.

#### Skin Protection:

- **Hand protection:** Wear rubber, neoprene, or plastic acid-resistant gloves
- **Body protection:** Under severe exposure or emergency conditions, wear acid-resistant clothing, apron, gloves, and boots

**Other Protection:** Safety shower and eyewash station. Chemical impervious apron and face shield recommended when adding water or electrolyte to batteries (not required for sealed, non-spillable batteries).

### Hygiene Measures

Handle in accordance with good industrial hygiene and safety practices. Remove and wash contaminated clothing before re-use. Wash hands and exposed skin thoroughly after handling. Do not eat, drink, or smoke in work areas.

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## Section 9 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### Information on Basic Physical and Chemical Properties

|  |  |
|--|--|
| <b>Appearance</b>                              | Sealed battery in polypropylene case with metal terminals  |
| <b>Physical State</b>                          | Solid (battery assembly)   |
| <b>Color</b>                                   | <b>Battery case:</b> Black or grey polypropylene. Lead plates: Grey metallic.<br><b>Electrolyte:</b> Absorbed in glass mat |
| <b>Odor</b>                                    | No apparent odor (sealed unit)   |
| <b>Odor Threshold</b>                          | Not applicable   |
| <b>pH</b>                                      | < 2 (electrolyte)  |
| <b>Melting Point / Freezing Point</b>          | 320°F / 160°C (polypropylene case)   |
| <b>Initial Boiling Point and Boiling Range</b> | Not applicable (sealed unit)   |
| <b>Flash Point</b>                             | Not applicable (sealed unit)   |
| <b>Evaporation Rate</b>                        | Not applicable   |
| <b>Flammability (solid, gas)</b>               | Not flammable (sealed battery). Hydrogen gas is extremely flammable  |
| <b>Upper/Lower Flammability Limits</b>         | Hydrogen: LEL 4%, UEL 75% (by volume in air)   |
| <b>Vapor Pressure</b>                          | Not applicable (sealed unit)   |
| <b>Vapor Density</b>                           | Hydrogen: 0.069 (air = 1); Sulfuric acid vapor: 3.4 @ STP (air = 1)  |
| <b>Relative Density (Specific Gravity)</b>     | 1.250 - 1.320 (electrolyte)  |
| <b>Solubility(ies)</b>                         | Electrolyte: 100% soluble in water   |
| <b>Partition Coefficient (n-octanol/water)</b> | Not applicable   |
| <b>Auto-ignition Temperature</b>               | Polypropylene: 675°F / 357°C; Hydrogen: 1085°F / 585°C   |
| <b>Decomposition Temperature</b>               | > 320°F / 160°C (polypropylene)  |
| <b>Viscosity</b>                               | Not applicable   |
| <b>Explosive Properties</b>                    | Hydrogen gas forms explosive mixtures with air (4-75% by volume)   |
| <b>Oxidizing Properties</b>                    | Sulfuric acid is an oxidizer   |

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## Section 10 - STABILITY AND REACTIVITY

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### Reactivity

Sulfuric acid is a strong oxidizer and is reactive with many materials. Lead is relatively stable under normal conditions. During charging, hydrogen gas is generated which is extremely flammable and forms explosive mixtures with air.

### Chemical Stability

**Stable** under normal storage and handling conditions when maintained as a sealed unit.

### Possibility of Hazardous Reactions

Hazardous polymerization will not occur. Sulfuric acid reacts violently with water (exothermic reaction). Contact with metals may generate hydrogen gas. Short circuits can cause thermal runaway and potential rupture or explosion.

**Conditions to Avoid:**

- Avoid overcharging and over-discharging
- Avoid smoking, sparks, open flames, and other ignition sources near battery
- High temperatures (cases decompose at > 320°F)
- Mechanical damage to battery case
- Short circuit conditions
- Mixing with incompatible materials

**Incompatible Materials:**

- Strong oxidizers (may react violently with sulfuric acid)
- Strong bases (react with sulfuric acid)
- Water (reacts exothermically with concentrated sulfuric acid)
- Reactive metals (may generate hydrogen gas)
- Organic materials and combustibles (with sulfuric acid)
- Carbides, chlorates, fulminates, nitrates, picrates, powdered metals

**Hazardous Decomposition Products****Under fire conditions or excessive heat:**

- Sulfur dioxide (SO<sub>2</sub>)
- Sulfur trioxide (SO<sub>3</sub>)
- Carbon monoxide (CO)
- Carbon dioxide (CO<sub>2</sub>)
- Hydrogen sulfide (H<sub>2</sub>S)
- Sulfuric acid mist
- Lead oxide fumes
- Hydrogen gas

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**Section 11 - TOXICOLOGICAL INFORMATION**

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**Information on Toxicological Effects****Lead and Lead Compounds (CAS 7439-92-1)****Acute Toxicity:**

- **Oral LD50:** 1,000-10,000 mg/kg (rat) - Category 4
- **Dermal LD50:** No data available - Category 4 (estimated)
- **Inhalation LC50:** No data available - Category 4 (estimated)

**Acute Effects - Inhalation/Ingestion:** Exposure to lead and its compounds may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, pain in the legs, arms and joints, and kidney damage.

**Chronic Effects - Inhalation/Ingestion:** Prolonged exposure to lead and its compounds may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia and wrist drop. Symptoms of central nervous system damage may include fatigue, headaches,

nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, pain in the legs, arms and joints, and kidney damage.

**Chronic Effects - Inhalation/Ingestion:** Prolonged exposure to lead and its compounds may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia and wrist drop. Symptoms of central nervous system damage may include fatigue, headaches, tremors, hypertension, hallucinations, convulsions and delirium. Kidney dysfunction and possible injury has also been associated with chronic lead poisoning.

**Reproductive Toxicity:** Lead compounds (not pure lead) are classified as toxic to reproduction (Category 1A), possibly causing harm to the unborn child. Chronic over-exposure to lead has been implicated as a causative agent for the impairment of male and female reproductive capacity. Pregnant women should be protected from excessive exposure. Lead can cross the placental barrier and the unborn may suffer neurological damage or developmental problems.

**Carcinogenicity:**

- **IARC:** Group 2B (possibly carcinogenic to humans)
- **NTP:** Reasonably anticipated to be a human carcinogen
- **OSHA:** Not listed as a carcinogen
- **GHS Classification:** Category 1B carcinogen

Lead is likely carcinogenic to animals at extreme dose levels.

**Primary Routes of Exposure:** Ingestion and inhalation of dust and fumes.

**Target Organs:** Central nervous system, blood-forming system (hematopoietic system), kidneys, reproductive system.

**Sulfuric Acid (CAS 7664-93-9)**

**Acute Toxicity:**

- **Oral LD50:** 2,140 mg/kg (rat)
- **Dermal LD50:** No reliable data
- **Inhalation LC50:** 347 mg/m<sup>3</sup>/4hr (rat, aerosol)

**Skin Corrosion/Irritation:** Category 1A - Causes severe skin burns

**Eye Damage:** Category 1 - Causes serious eye damage

**Acute Effects:** Harmful exposure to sulfuric acid can occur by all routes of entry. Causes severe irritation, burns and ulceration. Can cause blindness.

**Chronic Effects:** Repeated or prolonged exposure to sulfuric acid mist may cause erosion of tooth enamel and inflammation of the upper respiratory tract.

**Carcinogenicity:**

- IARC: Group 1 - "Strong inorganic acid mists containing sulfuric acid" are carcinogenic to humans (occupational exposure to strong inorganic acid mists)
- Note: Inorganic sulfuric acid mist is not generated during normal use of sealed batteries
- GHS Classification: Category 1B carcinogen (for acid mist)

**Respiratory Sensitization:** Not classified

**Target Organs:** Respiratory system, eyes, skin, teeth

**Summary of Health Hazards**

**Under normal operating conditions (sealed battery):** Minimal risk of exposure. Primary hazards are related to improper handling, damage to case, or charging operations.

**Under abnormal conditions (damaged case, overcharging):**

- **Immediate effects:** Severe burns from acid contact, eye damage, respiratory irritation
- **Delayed effects:** Systemic lead toxicity, reproductive harm, cancer from chronic exposure
- **Chronic effects:** Central nervous system damage, kidney damage, blood disorders, reproductive effects

**Specific Target Organ Toxicity (Repeated Exposure):** Category 2 - May cause damage to organs (central nervous system, blood, kidneys) through prolonged or repeated exposure.

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## Section 12 - ECOLOGICAL INFORMATION

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**Ecotoxicity****Aquatic Toxicity Data****Lead (CAS 7439-92-1):**

- Fish (Rainbow trout) 96-hour LC50: 0.4-8.4 mg/L (soluble lead salts)
- Aquatic invertebrates (Daphnia magna) 48-hour EC50: 0.6 mg/L
- Algae (Green algae) 72-hour EC50: 0.16-2.8 mg/L
- **GHS Classification:** Very toxic to aquatic life (Acute Category 1), Very toxic to aquatic life with long-lasting effects (Chronic Category 1)

**Sulfuric Acid (CAS 7664-93-9):**

- Fish (Brachydanio rerio) 24-hour LC50: 82 mg/L
- Fish (Cyprinus carpio) 96-hour LOEC: 22 mg/L
- GHS Classification: Not classified for aquatic toxicity (rapid neutralization in water)

**Persistence and Degradability**

**Lead:** Not biodegradable. Lead is persistent in soil and sediment. In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates and phosphates and then precipitates out of the water. Mobility of metallic lead between ecological compartments is slow.

**Sulfuric Acid:** Not applicable. Rapidly neutralized in the environment.

### **Bioaccumulative Potential**

**Lead:** Lead (dissolved phase) is bioaccumulated by plants and animals, both aquatic and terrestrial.

Bioconcentration factor (BCF) in fish: 10-200 (low to moderate bioaccumulation potential).

**Sulfuric Acid:** Does not bioaccumulate.

### **Mobility in Soil**

**Lead:** Most lead is strongly retained in soil, resulting in little mobility. Lead may be immobilized by ion exchange with hydrous oxides, clays or by chelation with humic or fulvic acids in the soil. Generally low mobility in soil ( $K_{oc} > 1000$ ).

**Sulfuric Acid:** High mobility when neutralized to sulfate.

### **Other Adverse Effects**

Lead and its compounds can pose a severe threat to wildlife and ecosystems. Contamination of water, soil and air should be prevented. Lead exposure can cause toxic effects in birds, mammals, and aquatic organisms even at low concentrations.

### **Additional Information**

**Volatile Organic Compounds (VOC):** 0% (by volume)

**PBT/vPvB Assessment:** Lead meets criteria for persistence and bioaccumulation.

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## **Section 13 - DISPOSAL CONSIDERATIONS**

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### **Waste Treatment Methods**

**Product Disposal:** Fullriver batteries are 100% recyclable by any licensed battery reclamation operation. Because these batteries contain lead, sulfuric acid and other hazardous materials, they must NEVER be:

- Discarded in trash
- Disposed of in landfills
- Incinerated
- Crushed or punctured before proper recycling

### **Recommended Disposal:**

- Return to manufacturer or authorized battery recycler
- Contact licensed battery recycling facility
- Small quantities can be taken to local Household Hazardous Waste Management facilities
- Commercial quantities should be managed through licensed hazardous waste haulers

### **Disposal Considerations**

This product contains hazardous materials and is subject to regulations under:

- RCRA (Resource Conservation and Recovery Act) - May be regulated as hazardous waste (D008 for lead)
- State and local regulations may be more stringent than federal requirements
- Batteries must be managed as Universal Waste or fully regulated hazardous waste depending on state requirements



**EPA Waste Number:** D008 (Characteristic: Toxicity - Lead)

### **Special Precautions for Disposal**

Handle with care to avoid case damage and acid leakage. Store used batteries in leak-proof containers. Keep away from incompatible materials. Protect from physical damage during storage and transport to recycling facility.

### **Contaminated Packaging**

Empty containers may contain residual product. Follow disposal recommendations for product. Rinse and recycle if possible, or dispose of in accordance with local, state, and federal regulations.

### **Recycling Information**

For assistance with battery recycling, please contact:

- **Fullriver Battery:** (800) 522-8191
- **Find a recycling center:** [https://www.ehso.com/find\\_a\\_recycling\\_center.php](https://www.ehso.com/find_a_recycling_center.php)
- **Battery recycling information:** <https://www.ehso.com/batteries.php>
- **Call2Recycle:** 1-877-723-1297 or visit [call2recycle.org/](http://call2recycle.org/)

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## **Section 14 - TRANSPORT INFORMATION**

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### **Regulatory Information**

All Fullriver AGM batteries are valve regulated lead acid (VRLA) batteries. Fullriver's VRLA batteries have passed vibration, pressure differential and free flowing acid tests under 49 CFR 173.159a, the vibration and pressure differential test under IATA Packing Instruction 872, meet IATA Special Provisions A48, A67 and A183, and IMDG Special Provisions 238.1 and 238.2. The batteries are securely packaged, protected from short circuits and labelled "Non-Spillable".

### **Fullriver's VRLA batteries are EXEMPT from:**

- DOT Hazardous Material Regulations
- IATA Dangerous Goods Regulations
- IMDG Code

### **US DOT (Department of Transportation) - 49 CFR 172.101**

**UN Number:** UN2800

**Proper Shipping Name:** Batteries, wet, non-spillable / Battery, wet, non-spillable, electric storage

**Hazard Class:** Not Regulated (when meeting exemption criteria)

**Packing Group:** Not Applicable

**Special Provisions:** 238 (non-spillable batteries)

**Exemption:** Batteries meeting the requirements of 49 CFR 173.159a are not subject to the requirements of 49 CFR Parts 171-180 when:

- Batteries have passed vibration and pressure differential performance tests
- Batteries have passed the ruptured case test for non-spillable designation
- Outer packaging is marked "NON-SPILLABLE" or "NON-SPILLABLE BATTERY"
- Terminals are protected from short circuit

**Marine Pollutant:** No

**IATA (International Air Transport Association)**

**UN Number:** UN2800

**Proper Shipping Name:** Batteries, wet, non-spillable

**Hazard Class:** Not Restricted (when meeting exemption criteria)

**Packing Instruction:** 872

**Special Provisions:** A48, A67, A183

**Exemption Requirements:**

- Batteries have passed vibration and pressure differential performance tests
- Batteries have passed the ruptured case test for non-spillable designation
- When packaged for transport, the terminals are protected from short circuit
- The words "NOT RESTRICTED" and the Special Provision numbers (A67 or A183) must be included in the description on the Air Waybill as required by 8.2.6 when Air Waybill is issued

**Passenger Aircraft:** Allowed (when properly marked)

**Cargo Aircraft:** Allowed (when properly marked)

**IMO/IMDG (International Maritime Dangerous Goods Code)**

**UN Number:** UN2800

**Proper Shipping Name:** BATTERIES, WET, NON-SPILLABLE or BATTERY, WET, NON-SPILLABLE, electric storage

**Hazard Class:** Not Regulated (when meeting exemption criteria)

**Special Provisions:** 238

**Exemption Requirements:**

- Batteries have passed vibration and pressure differential performance tests
- Batteries have passed the ruptured case test for non-spillable designation
- When packaged for transport, the terminals are protected from short circuit
- Batteries must be securely packaged and marked "NON-SPILLABLE"

**Marine Pollutant:** Yes (Lead content) - but exempted when meeting non-spillable criteria

**Transport in Bulk According to Annex II of MARPOL 73/78 and IBC Code**

Not applicable. Product is not transported in bulk.

**Special Precautions for User**

- Protect batteries from short circuits during transport
- Protect terminals with non-conductive caps or covers
- Secure batteries to prevent movement and damage during transport
- Stack batteries according to manufacturer specifications
- Do not transport damaged or leaking batteries as non-spillable
- Ensure adequate ventilation during transport to prevent hydrogen accumulation
- Keep away from heat sources and ignition sources

**Additional Information**

When batteries do not meet the exemption criteria (damaged, leaking, or not meeting test requirements), they must be transported as:

- **UN2794** - Batteries, wet, filled with acid, electric storage
- **Hazard Class:** 8 (Corrosive)
- **Packing Group:** III
- Subject to full hazardous materials regulations

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**Section 15 - REGULATORY INFORMATION**

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**Safety, Health and Environmental Regulations****United States (U.S.) Federal Regulations****OSHA Hazard Communication Standard (29 CFR 1910.1200):**

- Classified as Hazardous: YES
- Lead: YES
- Sulfuric Acid: YES

**TSCA (Toxic Substances Control Act) Inventory Status:**

- All components are listed on the TSCA Inventory: YES

**CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) - 40 CFR 302:**

**Hazardous Substances (Section 304):**

- Lead (CAS 7439-92-1): RQ = N/A\* (Reportable Quantity not applicable for solid metal pieces  $\geq 100 \mu\text{m}$  diameter)

- Lead Compounds: RQ = 10 pounds

- Sulfuric Acid (CAS 7664-93-9): RQ = 1,000 pounds

\*Note: Reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100  $\mu\text{m}$  (micrometers).

**SARA Title III (Superfund Amendments and Reauthorization Act):****Section 302 - Extremely Hazardous Substances:**

- Sulfuric Acid: YES (TPQ = 1,000 pounds)

- Lead and Lead Compounds: Not listed as EHS

**Section 311/312 - Hazard Categories (40 CFR 370):**

- Acute Health Hazard: YES

- Chronic Health Hazard: YES

- Fire Hazard: YES

- Sudden Release of Pressure Hazard: YES

- Reactive Hazard: NO

**Section 313 - Toxic Release Inventory (TRI) (40 CFR 372):**

- Lead (CAS 7439-92-1): YES (threshold = 100 pounds)

- Lead Compounds: YES (threshold = 100 pounds)

- Sulfuric Acid (CAS 7664-93-9): YES (threshold = 10,000 pounds for aerosol forms only)

**RCRA (Resource Conservation and Recovery Act) - 40 CFR 261:**

- Lead and lead compounds: Characteristic Hazardous Waste - D008 (Toxicity - Lead)

- Sulfuric Acid: Characteristic Hazardous Waste - D002 (Corrosivity) if  $\text{pH} \leq 2$  or  $\geq 12.5$

- Batteries may be managed as Universal Waste under 40 CFR Part 273

**Clean Air Act (CAA) - 40 CFR 68:**

- Sulfuric Acid: Not listed as a regulated substance under CAA Section 112(r)

**Clean Water Act (CWA):**

- Lead: Priority Pollutant (40 CFR 423 Appendix A)

- Sulfuric Acid: Not specifically regulated

**OSHA Process Safety Management (PSM) - 29 CFR 1910.119:**

- Not applicable

**OSHA Lead Standard - 29 CFR 1910.1025:**

- Applies to occupational exposure to lead

- Action Level:  $30 \mu\text{g}/\text{m}^3$  (8-hour TWA)

- PEL:  $50 \mu\text{g}/\text{m}^3$  (8-hour TWA)

## State Regulations

### California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

**WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- **Lead (CAS 7439-92-1):**

- o Listed as causing cancer (October 1, 1992)
- o Listed as causing reproductive toxicity (developmental endpoint) (February 27, 1987)
- o Listed as causing reproductive toxicity (male and female) (October 1, 1992)

- **Lead Compounds:**

- o Listed as causing reproductive toxicity

- **Sulfuric Acid (strong inorganic acid mists):**

- o Listed as causing cancer (as strong inorganic acid mists containing sulfuric acid)

### Maximum Allowable Dose Levels (MADL) and No Significant Risk Levels (NSRL):

- Lead and lead compounds: MADL = 0.5 µg/day (reproductive toxicity)
- Lead: NSRL = 15 µg/day (cancer)

### Massachusetts Right to Know (105 CMR 670):

- Lead: Listed
- Sulfuric Acid: Listed

### New Jersey Right to Know (N.J.A.C. 8:59):

- Lead: Listed (RTK Number 1111)
- Sulfuric Acid: Listed (RTK Number 1741)

### Pennsylvania Right to Know (34 Pa. Code, Chapter 323):

- Lead: Listed
- Sulfuric Acid: Listed

### Rhode Island Right to Know:

- Lead: Listed
- Sulfuric Acid: Listed

**Other State Regulations:** Individual state regulations may be more stringent than federal requirements. Consult state and local authorities for specific requirements.

## International Regulations

### Canadian Regulations:

#### WHMIS Classification (Workplace Hazardous Materials Information System):

- Class D1A - Very Toxic Material Causing Immediate and Serious Toxic Effects
- Class D2A - Very Toxic Material Causing Other Toxic Effects
- Class E - Corrosive Material

**Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL):**

- All components are listed on the DSL: YES

**Canadian Controlled Product Regulations (CPR):**

- Distribution into Quebec must follow Canadian Controlled Product Regulations 24(1) and 24(2)

**European Union Regulations:****REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) - Regulation (EC) No 1907/2006:**

- Lead: Substance of Very High Concern (SVHC) - Included in Candidate List
- Lead compounds may be subject to authorization requirements

**CLP (Classification, Labelling and Packaging) - Regulation (EC) No 1272/2008:**

- Product is classified according to CLP criteria

**RoHS (Restriction of Hazardous Substances) - Directive 2011/65/EU:**

- Lead in batteries is exempted from RoHS restrictions (Annex III, exemption 7c(I))

**Battery Directive - Directive 2006/66/EC:**

- Batteries containing more than 0.004% lead by weight must be marked with the chemical symbol Pb
- Subject to collection, recycling, and disposal requirements

**WEEE Directive (Waste Electrical and Electronic Equipment) - Directive 2012/19/EU:**

- Industrial batteries are excluded but must be collected separately

**Distribution into EU:**

- Must follow applicable EU Directives for Use, Import/Export of the product as sold

**Other International Inventories**

**Australia AICS (Australian Inventory of Chemical Substances):** All components listed

**China IECSC (Inventory of Existing Chemical Substances in China):** All components listed

**Japan ENCS (Existing and New Chemical Substances):** All components listed

**Korea ECL (Existing Chemicals List):** All components listed

**Philippines PICCS (Philippine Inventory of Chemicals and Chemical Substances):** All components listed

**Taiwan TCSI (Taiwan Chemical Substance Inventory):** All components listed

**New Zealand IOC (Inventory of Chemicals):** All components listed

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## Section 16 - OTHER INFORMATION

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### Revision Information

**Revision Date:** January 1, 2025

**Version:** 2.0

**Revision Summary:** Updated to include complete GHS hazard classifications, hazard statements, pictograms, and precautionary statements based on regulatory guidance. Added CHEMTREC emergency contact. Enhanced sections 4-15 with additional safety and regulatory information.

### Sections Revised:

- **Section 1:** Added CHEMTREC emergency contact
- **Section 2:** Complete GHS classification with all hazard statements and pictograms
- **Section 4:** Enhanced first aid measures
- **Section 5:** Added detailed fire and explosion information
- **Section 6:** Expanded spill response procedures
- **Section 7:** Enhanced handling and storage precautions
- **Section 8:** Complete exposure control information
- **Section 9:** Comprehensive physical and chemical properties
- **Section 10:** Detailed stability and reactivity information
- **Section 11:** Complete toxicological information
- **Section 12:** Comprehensive ecological information
- **Section 13:** Enhanced disposal considerations
- **Section 14:** Complete transport information for all modes
- **Section 15:** Comprehensive regulatory information
- **Section 16:** Updated revision information

### Abbreviations and Acronyms:

- **ACGIH:** American Conference of Governmental Industrial Hygienists
- **AGM:** Absorbed Glass Mat
- **ANSI:** American National Standards Institute
- **CAS:** Chemical Abstracts Service
- **CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act
- **CFR:** Code of Federal Regulations
- **CLP:** Classification, Labelling and Packaging (EU)
- **CPR:** Canadian Controlled Product Regulations
- **DSL:** Domestic Substances List (Canada)
- **EC:** European Commission
- **EPA:** Environmental Protection Agency
- **EPCRA:** Emergency Planning and Community Right-to-Know Act
- **GHS:** Globally Harmonized System of Classification and Labelling of Chemicals
- **IARC:** International Agency for Research on Cancer
- **IATA:** International Air Transport Association
- **IMDG:** International Maritime Dangerous Goods



- **IMO:** International Maritime Organization
- **LC50:** Lethal Concentration 50%
- **LD50:** Lethal Dose 50%
- **LEL:** Lower Explosive Limit
- **LOEC:** Lowest Observed Effect Concentration
- **MADL:** Maximum Allowable Dose Level
- **NIOSH:** National Institute for Occupational Safety and Health
- **NSRL:** No Significant Risk Level
- **NTP:** National Toxicology Program
- **OSHA:** Occupational Safety and Health Administration
- **PEL:** Permissible Exposure Limit
- **PPE:** Personal Protective Equipment
- **PSM:** Process Safety Management
- **RCRA:** Resource Conservation and Recovery Act
- **REACH:** Registration, Evaluation, Authorization and Restriction of Chemicals
- **REL:** Recommended Exposure Limit
- **RoHS:** Restriction of Hazardous Substances
- **RQ:** Reportable Quantity
- **SARA:** Superfund Amendments and Reauthorization Act
- **SCBA:** Self-Contained Breathing Apparatus
- **SDS:** Safety Data Sheet
- **STEL:** Short-Term Exposure Limit
- **SVHC:** Substance of Very High Concern
- **TLV:** Threshold Limit Value
- **TPQ:** Threshold Planning Quantity
- **TRI:** Toxic Release Inventory
- **TSCA:** Toxic Substances Control Act
- **TWA:** Time-Weighted Average
- **UEL:** Upper Explosive Limit
- **UN:** United Nations
- **VOC:** Volatile Organic Compound
- **VRLA:** Valve Regulated Lead Acid
- **WEEE:** Waste Electrical and Electronic Equipment
- **WHMIS:** Workplace Hazardous Materials Information System

### Key Literature References and Sources

- 29 CFR 1910.1200 - OSHA Hazard Communication Standard
- 29 CFR 1910.1025 - OSHA Lead Standard
- 40 CFR Parts 260-273 - EPA Hazardous Waste Regulations
- 49 CFR Parts 171-180 - DOT Hazardous Materials Regulations
- IATA Dangerous Goods Regulations
- IMDG Code
- GHS Revision 7 (UN 2017)
- ACGIH TLVs and BEIs

- NIOSH Pocket Guide to Chemical Hazards
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans
- California Office of Environmental Health Hazard Assessment (OEHHA)
- Battery Council International (BCI) Guidelines

#### Training Requirements

Persons handling this product should be trained in:

- Proper battery handling and storage procedures
- Recognition of lead exposure hazards
- Use of personal protective equipment
- Emergency response procedures
- OSHA Hazard Communication Standard (29 CFR 1910.1200)
- OSHA Lead Standard (29 CFR 1910.1025) where applicable
- DOT Hazardous Materials Transportation (if transporting)

#### Disclaimer and Legal Notice

The information above is believed to be accurate and represents the best information currently available to us. However, **Fullriver Battery makes no warranty of merchantability or any other warranty, expressed or implied**, with respect to such information, and we assume no liability resulting from its use.

Users should make their own investigation to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation.

This Safety Data Sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export-controlled information.

#### This SDS meets the requirements of:

- OSHA Hazard Communication Standard (29 CFR 1910.1200)
- United Nations GHS Revision 7
- ANSI Z400.1-2010 Standard for Hazard Communication

## **Contact Information for SDS Questions**

For questions regarding this Safety Data Sheet, contact:

### **Fullriver Battery**

Aaron Plew, Director of Product Management  
3823 Mission Oaks Blvd, Suite A  
Camarillo, CA 93012

Phone: 800-522-8191 (Toll Free)

Phone: 805-484-7900 (International)

Website: [fullriverbattery.com](http://fullriverbattery.com)

### **For Chemical Emergencies (24 hours):**

CHEMTREC: 800-424-9300 (North America)

CHEMTREC: +1-703-527-3887 (International)