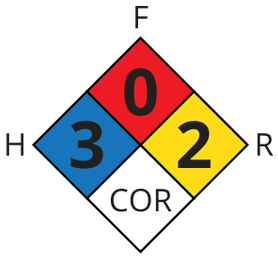
Fullriver Battery
Valve Regulated Lead Acid (VRLA) Battery

Safety Data Sheet

Hazard Rating



Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Valve Regulated Sealed Non-Spillable Lead Acid Battery**	Product Use: **Electric Storage Battery**
Manufacturer's Name: **Fullriver Battery Manufacture Co. Ltd.**	Phone: 800-522-8191 (Toll Free) 805-484-7900 (International)
Address: P.O. Box 511475, Taishi Industrial Area, Yuwotou Town, Panyu Zone, Guangzhou, China 3823 Mission Oaks Blvd, Suite A, Camarillo, CA 93012, U.S.A.	Revised Date: **October 23, 2023**
Person Responsible for Preparation: **Aaron Plew, Director of Product Management**	UN / DG Class: **UN2800, Non-DG**

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

GHS Classification:

Health	
Acute toxicity (oral, dermal, inhalation)	Category 4
Skin corrosion/irritation	Category 1A
Eye damage	Category 1
Reproductive	Category 1A
Carcinogenicity (lead)	Category 1B
Carcinogenicity (acid mist)	Category 1B
Specific target organ toxicity (repeated exposure)	Category 2

Environmental	
Aquatic	Chronic 1
Aquatic	Acute 1

Physical State
Chemical

GHS Label:

Health

Hazard statements
DANGER!
Normal Operating Conditions
- May damage fertility of the unborn child if ingested or inhaled.
- May cause cancer if ingested or inhaled.
- Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure.

Abnormal Conditions (broken case or extreme overcharging)
- Causes severe skin burns and serious eye damage.
- May form explosive air/gas mixture during charging.
- Extremely flammable gas (hydrogen)
- Explosive, fire, blast, or projection hazard.

Environmental **Physical**

Precautionary statements
- Wash thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Wear protective gloves/clothing and eye/face protection.
- Avoid breathing dust, fume, gas, mist, vapor and spray.
- Use only outdoors or in well-ventilated areas.
- Causes skin irritation and serious eye damage.
- Contact with internal components may cause irritation or severe burns
- Avoid contact with internal acid.
- Irritation to eyes, respiratory system and skin.

Section 3 - COMPOSITION/INFORMATION ON INGREDIENTS

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

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

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

Section 5 - FIREFIGHTING MEASURES

Flash Point: ***Not Applicable***	Flammable Limits in air % by volume: *Not Applicable*	Extinguishing media - Class ABC, CO_2, Halon. Do not use carbon dioxide directly on cells. Avoid breathing vapors.	Auto-ignition 675° (polypropylene) temperature
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 -pressure mode.		
Hazardous Combustion Products	During normal operations, small amounts of highly flammable hydrogen gas may be generated during charging and operation of batteries. Avoid open flames, sparks and other sources of ignition near batteries.		
Unusual Fire and Explosion Hazards	Sulfuric acid vapors are generated upon overcharge and polypropylene case failure. Use adequate ventilation. Avoid open flames, sparks and other sources of ignition near batteries. Carefully follow manufacturer's instructions for installation and service. 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.		

Section 6 - ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Avoid contact with any spilled material. Contain spill, isolate hazard area, and deny entry. Limit site access to emergency responders. Neutralize with sodium bicarbonate, soda ash, lime or other neutralizing agent. Place battery in suitable container for disposal. 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.

Personal Precautions: Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side/face shields recommended.

Environmental Precautions: Lead (and its compounds) and sulfuric acid can pose a severe threat and the contamination of water, soil and air should be prevented.

Section 7 - HANDLING AND STORAGE

Precautions to be Taken in Handling and Storage	Store away from reactive materials, open flames and sources of ignition as defined in Section 10 - Stability and Reactivity Data. Store batteries in cool, dry, well-ventilated areas. Batteries should be stored under roof for protection against adverse weather conditions. 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.
Precautions During Charging	Use proper voltages during charging (see battery documentation). **Never use a battery that has less than 80% of rated capacity and never "jump start" an aircraft that has a "dead" (discharged) battery. Always remove a "dead" battery from the aircraft and perform a capacity test to verify airworthiness.** Charge at constant potential (voltage) only. For optimum life, battery charge voltage should be adjusted with the battery operating temperature.
Other Precautions	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.

Section 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection	None required under normal conditions. Acid/gas NIOSH approved respirator is required when PEL is exceeded or employee experiences respiratory irritation.
Ventilation	Store and handle in dry, ventilated area.If mechanical ventilation is used, components must be acid resistant.
Skin Protection	Wear rubber or plastic acid-resistant gloves. Under sever exposure or emergency conditions, wear acid-resistant clothing, gloves, and boots.
Eye Protection	ANSI approved safety glasses with side/face shield recommended.
Other Protection	Safety shower and eyewash. Chemical impervious apron and face shield recommended when adding water or electrolyte to batteries (not required for sealed, non-spillable batteries).

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	Not applicable
Vapor Pressure:	Not applicable
Specific Gravity:	1.250 - 1.320
pH:	< 2
Melting Point:	320° F (polypropylene)
Percent Volatile by Volume:	Not applicable
Vapor Density (Hydrogen):	0.069 (air =1)
Vapor Density (Electrolyte):	3.4 @ STP (air = 1)
Evaporation Rate:	Not applicable
Solubility in Water:	100% soluble (electrolyte)
Reactivity in Water:	Electrolyte - water reactive (1)
Appearance and Odor:	**Battery:** Co-polymer polypropylene; may be contained within an outer casing of aluminum or steel. Case has metal terminals. **Lead:** Grey, metallic, solid, brown/grey oxide **Electrolyte:** Odorless, liquid absorbed glass mat material No apparent odor

Section 10 - STABILITY AND REACTIVITY

Stability	Stable
Conditions to Avoid	Avoid overcharging and smoking, sparks near battery surface. High temperature cases decompose at > 320° F
Incompatibility (Materials to Avoid)	Sparks, open flames, keep battery away from strong oxidizers
Hazardous Decomposition Products	Combustion can produce sulfur dioxide, carbon monoxide, sulfur trioxide, hydrogen sulfide and sulfuric acid mist
Hazardous Polymerization	Hazardous polymerization has not been reported

Section 11 - TOXICOLOGICAL INFORMATION

Lead	Sulfuric Acid
Lead is listed as a 2B carcinogen, likely carcinogenic to animals, other than humans at extreme dose levels. Lead compounds (not pure lead) are classified as possibly toxic to reproduction, possibly causing harm to the unborn child. The primary routes of exposure to lead are ingestion and inhalation of dust and fumes. **ACUTE 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 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. 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 unborn may suffer neurological damage or developmental problems.	The Internal Agency for Research on Cancer (IARC) has classified "strong inorganic mist containing sulfuric acid" as a Category 1 carcinogen: a substance that is carcinogenic to humans. Inorganic sulfuric acid mist is not generated during normal use. Harmful exposure to sulfuric acid can occur by all routes of entry. **ACUTE:** Severe irritation, burns and ulceration. Can also cause blindness.

Section 12 - ECOLOGICAL INFORMATION

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

Aquatic Toxicity:
Sulfuric Acid: 24-hour LC50, freshwater fish (Brachydanio rerio): 82 mg/L, 96-hour LOEC, freshwater fish (Cyprinus carpio): 22 mg/L
Lead: 48-hour LC50 (modeled for aquatic invertebrates): < 1 mg/L, based on lead bullion

Additional Information: Volatile Organic Compounds (VOC): 0% (by volume)

Section 13 - DISPOSAL CONSIDERATIONS

Fullriver batteries are 100% recyclable by any licensed reclamation operation. Because these batteries contain lead, sulfuric acid and other hazardous materials, they must never be discarded in the trash or in a landfill. Small quantities can be taken to local Household Hazardous Waste Management facilities, which are licensed to handle them. For assistance, please call Fullriver Battery at (800) 522-8191 or use either of the following links:

http://www.ehso.com/find_a_recycling_center.php
http://www.ehso.com/ehshome/batteries.php

Section 14 - TRANSPORT 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 CFR173.159.a, 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 and IMDG Code.

US DOT:
Exempted from the requirements because batteries have passed the vibration and pressure differential performance test, and ruptured case test for non-spillable designation.

IMO:
Exempted from the requirements because batteries have passed the vibration and pressure differential performance test, and ruptured case test for non-spillable designation. When packaged for transport, the terminals are protected from short circuit.

IATA:
Exempted from the requirements because batteries have passed the vibration and pressure differential performance test, and 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 must be included in the description of the substance on the Air Waybill as required by 8.2.6. when Air Waybill is issued.

Section 15 - REGULATORY INFORMATION

US Hazardous Under Hazard Communication Standard:	Lead - YES Sulfuric Acid - YES		
Ingredients Listed on TSCA Inventory:	YES		
CERCLA Section 304 Hazardous Substances:	Lead - YES Sulfuric Acid - YES	RQ: N/A* RQ: 1,000 pounds	**RQ: Reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100 µm (micrometers).*
EPCRA Section 302 Extremely Hazardous Substance:	Sulfuric Acid - YES		
EPCRA Section 313 Toxic Release Inventory:	Lead - CAS NO. 7439-92-1 Sulfuric Acid - CAS NO. 7664-93-9		

State Regulations (US):
California Proposition 65: This product contains lead, lead compounds and other chemicals known to the state to cause cancer and reproductive harm: Lead (CAS# 7439-92-1)

Internal Regulations:
Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).
Distribution into EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

Section 16 - OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, Fullriver Batterymakes 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.