FULLRIVER BATTERY MANUFACTURE CO., LTD

MATERIAL SAFETY DATA SHEET

All Fullriver Batteries

Valve Regulated (VRLA) Batteries
Absorbed Electrolyte (AGM)

SECTION 1: PRODUCT IDENTIFICATION AND COMPANY INDENTIFICATION

Chemical/trade Name(as used on label):	**Chemical Family/Classification**
Absorbed Electrolyte Battery ； Sealed Valve Regulated Lead-Acid Battery	Electric Storage Battery
Manufacturer's Name:	**Date revised:** Nov. 27, 2008
FULLRIVER BATTERY MANUFACTURE CO.,LTD	
Address:	**Telephone:**
P.O.BOX 511475 Taishi industrial Area, Yuwotou Town, Panyu Zone, Guangzhou, China	86-20-84916671 **Web:** http://www.fullriver.com

SECTION 2: HAZARDOUS INGREDIENTS/IDENTIFY INFORMATION

COMPONENTS	Approximate % BY WEIGHT	CAS#	OSHA PEL	ACGIH TLV	NIOSH
Inorganic Lead/Lead Compounds	65%~75%	7439-92-1	50 μg/m^3	150 μg/m^3	100 μg/m^3
Tin	<0.5%	7440-31-5	2000 μg/m^3	2000μg/m^3	N/A
Calcium	<0.2%	7440-70-2	N/A	N/A	N/A
Sulfuric Acid/Battery Electrolyte 1.300sg 40wt%	16%~21%	7664-93-9	1mg/m^3	1mg/m^3	1 mg/m^3
Fiberglass Separator	5%	–	N/A	N/A	N/A
Case Material: Acrylonitrile Butadiene Styrene(ABS)	5%-10%	9003-56-9	N/A	N/A	N/A

NOTE: Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by FULLRIVER Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type.

SECTION 3: HEALTH HAZARD INFORMATION

Routes of Entry:

Sulfuric Acid: Harmful by all routes of entry.

Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume.

Inhalation:

Sulfuric Acid: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation

Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Fiberglass Separator: Fiberglass is an irritant to the upper respiratory tract, skin and eyes. For exposure up to 10F°/ use MSA Comfoll with type H filter. Above 10F use Ultra Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

Ingestion:

Sulfuric Acid: May cause severe irritation of mouth, throat, esophagus and stomach.

Lead Compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to systemic toxicity and must be treated by a physician.

Skin Contact:

Sulfuric Acid: Severe irritation, burns and ulceration.

Lead Compounds: Not absorbed through the skin.

Eye Contact:

Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.

Lead Components: May cause eye irritation.

Effects of Overexposure - Acute:

Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.

Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic:

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.

Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females.

Carcinogenicity:

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.

Lead Compounds: Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Medical Conditions Generally Aggravated by Exposure:

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neuralgic diseases.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation:

Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen.

Lead Compounds: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion:

Sulfuric Acid: Give large quantities of water; do not induce vomiting; consult physician.

Lead Compounds: Consult physician immediately.

Skin:

Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.

Lead Compounds: Wash immediately with soap and water.

Eyes:

Sulfuric Acid and Lead: Flush immediately with large amounts of water for a least 15 minutes; consult physician.

SECTION 4: FIRE AND EXPLOSION HAZARD DATA

FIRE AND EXPLOSIVE PROPERTIES:

Hydrogen Flash point: N/A **Hydrogen Auto ignition point**: 580°C

Hydrogen Flammable Limits in Air (% by Volume): LEL: 4.1 UEL: 74.2

Lower Explosion Limit (LEL), Upper Explosion Limit (UEL)

Extinguishing Media: Dry chemical, foam, CO_2

Special Fire Fighting Procedures:

Use Positive Pressure, self-contained breathing apparatus.

Unusual Fire and Explosion Hazards:

In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery..

SECTION 5: PRECAUTIONS FOR SAFE HANDING AND USE

Handling and Storage:

Store batteries in cool, dry, well-ventilated areas with impervious surfaces and adequate containment in the event of spills. Batteries should also be stored under roof for protection against adverse weather conditions. Separate from incompatible materials. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat.

Precautionary Labeling:

POISON - CAUSES SEVERE BURNS DANGER - CONTAINS SULFURIC ACID

Charging:

There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

SECTION 5: PRECAUTIONS FOR SAFE HANDING AND USE(CONTINUED)

Spill or Leak Procedures:

Stop flow of material; contain/absorb small spills with dry sand, earth, and vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of un-neutralized acid to sewer.

Waste Disposal Method:

Spent batteries: Send to secondary lead smelter for recycling.

SECTION 6: CONTROL MEASURES

Engineering Controls:

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.

Work Practices:

Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing when filling or handling batteries.

Respiratory Protection:

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection.

Protective Gloves:

Rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection:

Chemical goggles or face shield.

Other Protection:

Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots.

Emergency Flushing:

In areas where sulfuric acid is handled in concentrations greater then 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

SECTION 7: PHYSICAL DATA

Electrolyte:			
Boiling Point:	203-240℉	**Specific Gravity(H2O=1):**	1.300-1.330
Melting Point:	N/A	**Vapor Pressure(mm Hg):**	10
Solubility in Water:	100%	**Vapor Density (AIR = 1):**	3.4
Evaporation Rate: (Butyl Acetate = 1)	Less than 1	**% Volatile by Weight:**	N/A
Appearance and Odor:	Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.		

SECTION 8: REACTIVITY DATA

Stability: Stable

CONDITIONS TO AVOID: High temperature, Sparks and other sources of ignition.

Incompatibility (materials to avoid):

Electrolyte (Water and Sulfuric Acid Solution): Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas，

SECTION 8: REACTIVITY DATA(CONTINUED)

strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.

Lead compounds: Avoid contact with strong acids, bases, halides, halogenated, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.

Hazardous Byproducts:

Sulfuric Acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen.

Lead Compounds: High temperatures likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

SECTION 9: ECOLOGICAL INFORMATION

Lead and its compounds can pose a threat if released into the environment.

SECTION 10: TRANSPORT INFORMATION

All FULLRIVER AGM batteries, when transported by air, surface or by vessel are identified as **"Battery, Electric Storage, Wet, Nonspillable, Not Regulated".**

The battery(s) must be identified as above on the Bill of Lading and properly packaged with their terminals protected from short circuit. NA or UN numbers do not apply.

FULLRIVER AGM battery(s) warning label identifies each battery as NONSPILLABLE.

FULLRIVER AGM battery(s) preprinted cartons identify each battery as NONSPILLABLE.

FULLRIVER AGM battery(s) shipped without FULLRIVER cartons (bulk packed) need to be Identified as NONSPILLABLE or NONSPILLABLE BATTERY on the outer packaging.

Air: FULLRIVER AGM batteries meet the conditions in IATA/ICAO Special Provision A67.

Surface: FULLRIVER AGM batteries meet the conditions for DOT Haz Mat Regulations CFR-Tittle 49 parts 171-189.

Vessel: FULLRIVER Batteries meet the conditions of IMDG.

SECTION 11 -- REGULATORY INFORMATION

See 29 CFR 1910.268(b)(2)

SECTION 12 -- OTHER INFORMATION

The information herein is given is good faith, but no warranty, expressed or implied, is made.