

MATERIAL SAFETY DATA SHEET

VRLA AGM BATTERIES

Safety Data Sheet (SDS)

Data Sheet No: VRLA AGM Issue 1

Date Issued: March 30th 2017

1 Identification of the substance

Product name: Valve Regulated Lead Acid Battery
Chemical family/Classification Electric storage Battery

Trade name: As used on the label.

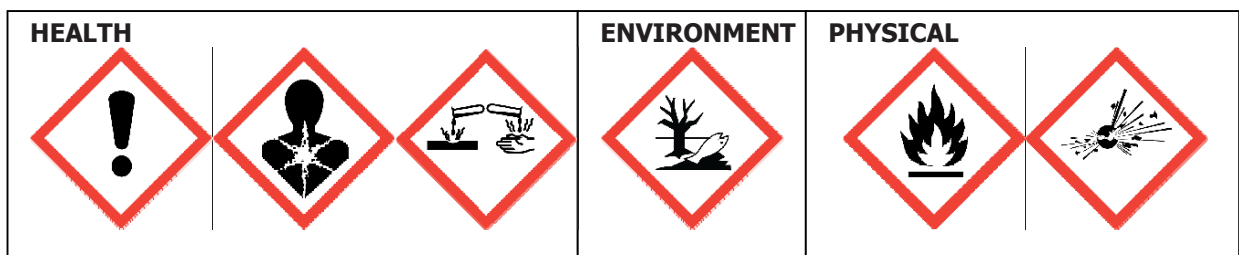
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2 Hazard Identification

Health	GHS Codes	Description
Acute Toxicity Category 4 Skin Corrosion/Irritation Category 1A Eye Damage Category 1 Reproductive Category 1A Carcinogenicity (lead compounds) Category 1B Carcinogenicity (Acid mist) Category 1A Specific Target Organ Category 2	H302	Harmful if swallowed
	H314	Causes severe skin burns and eye damage
	H332	Harmful if inhaled
	H360	May damage fertility or the unborn child
	H373	May cause damage to organs through prolonged or repeated exposure
	H220	Extremely flammable gas (Hydrogen)
	P260	Do not breathe dust/fume/gas/mist/vapours/spray
	P301/330/331	If SWALLOWED: rinse mouth. Do not induce vomiting
	P303/361/353	If ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P304/340	If INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P305/351/338	If IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
P310	Immediately call a poison center or doctor/physician.	
Handling	GHS Codes	Description
	P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking
	P260	Do not breathe dust/fume/gas/mist/vapours/spray
	P264	Wash thoroughly after handling
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P403	Store in well ventilated area
	P405	Store locked up
	P391	Collect spillage
	P273	Avoid release to the environment
	P501	Dispose of contents/container in accordance with local/regional/national/international regulation.
Environment	H410	Very toxic to aquatic life with long lasting effects.



SIGNAL WORD: DANGER

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3 Composition / Ingredient Information

Components Chemical Identity	CAS Number	OSHA PEL	ACGIH TLV	Percent By Weight	EC Number	Average
Lead	7439-92-1	50 µg/m ³	50 µg/m ³	45-55%	231-100-4	50%
Sulfuric Acid	7664-93-9	100 µg/m ³	1.00 mg/m ³	19-25%	231-639-5	22%
Lead Oxide	1309-60-0	50 µg/m ³	500 µg/m ³	19-23%	215-174-5	21%
Tin	7440-31-5			1-2%		
Copper	7440-50-8			<1%		
Acrylonitrile Butadiene Styrene (ABS)	97048-04- 9			7-9%		

4 First Aid Measures

Inhalation: Electrolyte: Remove patient to fresh air immediately. If patient has difficulty breathing, give oxygen. **Seek immediate medical attention.**
Lead Compounds: Remove from exposure, gargle with water, wash nose and lips, consult a physician as soon as possible.

Contact with skin: Electrolyte: Flush with large amounts of water for at least 15 minutes, remove shoes and contaminated clothing completely. All contaminated items should be thoroughly cleaned before reuse. **Seek immediate medical attention.**

Contact with eyes: Electrolyte and Lead compounds: Flush immediately. If substance has got into eyes, immediately wash out with plenty of water for at least 15 minutes. **Seek immediate medical attention.**

Ingestion: Electrolyte: Drink large amounts of water. Do not induce vomiting. **Seek immediate medical attention.**
Lead compounds: **Seek immediate medical attention.**

Most Important symptoms/effects, acute or delayed

Eyes: In the event of a battery rupturing or exploding, exposure to vapours or mists, or direct contact with liquid may cause redness, tearing, swelling, corneal damage and irreversible eye damage. Severe burns could result if splashed in the eyes with sulfuric acid.

Skin: Direct contact with the acid from inside a battery, can be severely irritating to the skin and can cause swelling, redness, burns (chemical), and severe skin damage. Any existing conditions may be aggravated.

Inhalation: In the event of a battery rupturing or exploding, the acid or gases may be harmful or fatal if inhaled, especially for an extended period. May cause severe irritation and burns to the respiratory system.

Ingestion: Ingestion may cause burns in the mouth or perforation of the esophagus or stomach. May be fatal if swallowed. Lead from a battery could also be ingested if care is not taken to wash hands thoroughly after handling batteries.
Lead may be toxic to blood, kidneys and the central nervous system. Repeated or prolonged ingestion of lead can produce permanent organ damage and be fatal.

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5 Fire-Fighting Measures

Auto-ignition point (Hydrogen) 580° C at 760 mm Hg
Flash point Hydrogen 259° C
Flammable limits: LEL – 4.1% (hydrogen gas in air) UEL 74.2%
Extinguishing media: CO2: Foam, dry chemical.

Batteries may rupture due to pressure build up when exposed to heat and may result in the release of corrosive materials.

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

Fire fighting procedures: If the batteries are electrically connected, shut off the power to the charging equipment. Note disconnected strings of batteries in series may still pose a risk of electric shock. Wear positive-pressure breathing apparatus, beware of acid splatter when dousing with water and wear acid resistant clothing, gloves face and eye protection.

Hazardous Combustion Products: During normal usage batteries release flammable hydrogen and oxygen gases.

6 Accidental Release Measures

Immediate Actions:	Shut off all ignition sources Avoid contact with skin eyes and clothing, do NOT touch spilled material Use personal protective material as per section 8 Remove combustible material Stop flow of spillage and contain using soda ash etc.
Environmental Protection	Notify authorities as required by local and regional laws. Avoid any discharge entering the drainage system
Clean Up Actions:	Small spill: Neutralise with soda ash Place in appropriate container Ventilate area Wash affected area with water Do not empty into drains Large spill: Contain liquid using absorbent material, by digging trenches or a dike. Absorb with dry earth, sand or other non-combustible material. Neutralize with a dilute solution of sodium carbonate. Dispose of all contaminated materials in accordance with current local regulations.

7 Handling and Storage

Under normal conditions of battery use, internal components will not present a health hazard

Handling:	Keep away from heat and sources of ignition Protect from physical damage Wash hands thoroughly after use Avoid sparks Avoid contact with metal jewelry and watches etc. Do Not Remove Vent Caps Do not double stack industrial batteries, it may cause damage.
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Storage: Keep in cool and dry & Protect from heat.
Store lead acid batteries with adequate ventilation.
Room ventilation is required for batteries utilised for standby power generation.
Never re-charge batteries in an unventilated, enclosed space.

8 Exposure Controls / Personal Protection

a) Occupational Exposure Limits

OSHA-PEL – Lead 0.05 mg/m³, Sulfuric Acid 0.5 mg/m³
ACGIH-TLV TWA Lead 0.05 mg/m³, TWA Sulfuric Acid 0.2 mg/m³

b) Personal protection: Wear safety shoes with toe protector.
Where internal components are liberated use rubber or neoprene boots.
Wear goggles/safety glasses giving complete eye protection.
Respiratory protection may be required under exceptional circumstances when Excessive air contamination exists.
Wear PVC mitts, gloves or gauntlets.

c) Use ventilation to exhaust airborne vapours and mists.

9 Physical and Chemical Properties

Odour: Not applicable.
Appearance: Sealed Valve Regulated lead Acid Battery
State under normal temp: Solid
Flash point (Hydrogen): 259° C

Internal components

pH - (Sulfuric acid): 1.3 Electrolyte appearance - Off white cloudy liquid
Boiling point: Battery Electrolyte 110° C, Lead 1755° C
(at 760 mm/Hg)
Melting point: Lead 327.4° C
Vapour pressure: 11.7
Vapour density: Battery Electrolyte 3.4, (air =1)
Specific gravity: Battery Electrolyte 1.3 g/cm³. (water =1)
Auto-ignition point: 580° deg C at 760 mm/Hg.
Water solubility: Battery Electrolyte is 100% soluble in water
LEL (lower exposure limit) 4.1% Hydrogen
UEL (upper exposure limit) 74.2% Hydrogen
Hydrogen Flash point below room temperature

10 Stability and Reactivity

Chemical stability - VRLA Batteries are considered stable at normal temperatures and conditions.
Conditions to avoid – Overcharging, sources of ignition, mechanical impact, Contact with incompatible chemicals

Keep away from heat and sources of ignition.

Incompatible with reducing agents. Incompatible with organic agents.

Decomposition products may include hydrogen.

Decomposition products may include sulphur oxides.

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11 Toxicological Information

Danger of cumulative effects. (R33)
May cause severe irritation.
May cause gastro-intestinal disturbances.
Can cause damage to the mucous membranes.

Routes of Entry:

Electrolyte: Harmful by all routes of entry.
Lead compounds: Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Inhalation:

Electrolyte: 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.

Ingestion:

Electrolyte: 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.

Skin Contact:

Electrolyte: Severe irritation, burns, and ulceration.
Lead compounds: Not absorbed through the skin.

Eye Contact:

Electrolyte: Severe irritation, burns, cornea damage, blindness.
Lead compounds: May cause eye irritation.

Effects of Overexposure - Acute:

Electrolyte: Severe skin irritation, damage to cornea may cause blindness, 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:

Electrolyte: 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 both males and females.

Carcinogenicity:

Electrolyte: The National Toxicology Program (NTP) and the International Agency for Research on Cancer (IARC) have classified "strong inorganic acid mist containing sulfuric acid" as a Category IB carcinogen, a substance that is carcinogenic to humans. This classification does not apply to sulfuric acid solutions in static liquid state or to electrolyte in batteries. Batteries subjected to abusive charging at excessively high currents for prolonged periods of time without vent caps in place may create a surrounding atmosphere of the offensive strong inorganic acid mist containing sulfuric acid.
Lead compounds: 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 electrolyte (water and sulfuric acid solution) with skin may aggravate skin diseases such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurological diseases.

Emergency and First Aid Procedures:

Inhalation:

Electrolyte: Remove to fresh air immediately. If breathing is difficult, give oxygen.
Lead compounds: Remove from exposure, gargle, wash nose and lips; consult physician.

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Ingestion:

Electrolyte: Give large quantities of water; **do not** induce vomiting; consult physician.
Lead compounds: Consult physician immediately.

Skin:

Electrolyte: 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:

Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes; consult physician immediately.

12 Ecological Information

Ecotoxicology - no information available. This product is not expected to present an environmental hazard if disposed of in line with the regulations.

Aquatic Toxicity

Sulfuric acid	24 hr LC50, freshwater fish 82 mg/l 96 hr LOEC, freshwater fish 22 mg/l
Lead	48 hr LC50, 1mg/l based on lead bullion

13 Disposal Considerations

Classification: This material and/or its container must be disposed of as hazardous waste.

Disposal considerations: Do not discharge into drains or the environment, dispose to an authorised waste collection point.

Dispose of in accordance with local, state, and federal regulations as applicable.

14 Transport Information

US Hazardous Materials Regulations 49CFR 173.159 (d,f) and 49 CFR 173.159a

We hereby certify that the range of Maintenance Free Rechargeable Sealed Lead Acid batteries conform to the UN2800 classification as "Batteries, Non- Spillable, and electric storage" as a result of passing the Vibration and Pressure Differential Test described in DOT [49 CFR 173.159(d,f) and IATA/ICAO [Special Provision A67].

IATA Dangerous Goods Regulations: Packing instruction 872 and Special Provision A67

Batteries have been tested in accordance with the vibration and pressure differential tests found in Packing instruction 872 and "rupture test" found in Special Provision A67 of the International Air Transport Association (IATA) Dangerous Goods Regulations.

When offered for transport, the batteries must be protected against short circuits and be securely packaged in accordance with Special Provision A67.

The words "Not Restricted" and "Special Provision A67" must be included in the description of the item in the airway bill.

Tested as per **IMDG Amendment. 36-12**, special provision 238 "a" and "b", Comply

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Having met the related conditions are EXEMPT from hazardous goods regulations for the purpose of transportation by US DOT, IATA, EU-ADR and IMDG and therefore are unrestricted for transportation by any means.

15 Regulatory information

EU Directive 67/548/EEC on the classification, packaging and labeling of dangerous substances. Annex 1

Classification: C; R35

Risk Phrases: R35

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

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity).

CERCLA (Superfund) and EPCRA:

Sulfuric Acid

(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is **1,000 lbs.** State and local reportable quantities for spilled sulfuric acid may vary.

(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of **1,000 lbs.**

(c) EPCRA Section 302 notification is required if **1,000 lbs** or more of sulfuric acid is present at one site. An average automotive/commercial battery contains approximately 5 lbs. of sulfuric acid. Contact your representative for additional information.

(d) EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of **500 lbs** or more and/or if lead is present in quantities of **10,000 lbs** or more.

Lead

The lead used in lead acid batteries does not qualify for any OSHA or EPCRA exemptions. Lead is not an EHS, and the following table outlines the applicable EPCRA sections and their respective thresholds for lead.

311- MSDS reporting greater than or equal to 10,000 lbs

312- Chemical inventory reporting (i.e. tier II) greater than or equal to 10,000 lbs

This product contains toxic chemicals as detailed in section 3, use this information for any report requirements.

State Regulations (US)

Proposition 65 warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling.

16 Other Information

Under normal conditions of battery use, internal components will not present a health hazard. The information contained in this Safety Data Sheet is provided for battery electrolyte (acid) and lead, for exposure that may occur during battery production or container breakage or under extreme heat conditions such as fire.

This Safety Data Sheet and the information therein does not constitute the user's own assessment of work place risk as required by other Health & Safety legislation.