



SAFETY DATA SHEET – AGM BATTERY

I. IDENTIFICATION

Product Identifier:

Absorbed Electrolyte Battery (AGM), Sealed Lead Acid Battery, Valve Regulated Lead Acid Battery, Non-Spillable Lead Acid Battery, HGL, DC, HGH

Product Use:

Electric Storage Battery / Lead Acid Storage Battery

Manufacturer:

Surrette Battery Company Limited

Prepared By:

Surrette Battery Company Limited

Preparation Date:

January 21, 2010

Revision Date:

August 5, 2016

Supplier Name & Address:

Surrette Battery Company Limited
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2. HAZARD IDENTIFICATION

HEALTH		ENVIRONMENTAL	PHYSICAL
Acute Toxicity (Oral/Dermal/Inhalation)	Category 4	Aquatic Chronic I	Explosive Chemical, Division 1.3
Skin Corrosion / Irritation	Category 1A	Aquatic Acute I	
Eye Damage	Category 1		
Reproductive	Category 1A		
Carcinogenicity (lead compounds)	Category 1B		
Carcinogenicity (arsenic)	Category 1A		
Carcinogenicity (acid mist)	Category 1B		
Specific Target Organ Toxicity (repeated exposure)	Category 2		

***NOTE:**

The AGM batteries are not hazardous when used according to the instructions of the manufacturer under normal conditions*

HAZARD STATEMENTS

DANGER!

Normal Operating Conditions

- May damage fertility or 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 eye damage
- Causes serious eye damage
- May form explosive air/gas mixture during charging
- Extremely flammable gas (hydrogen)
- Explosive, fire, blast or projection hazard

PRECAUTIONARY STATEMENTS

- Wash thoroughly after handling
- Do not eat, drink or smoke when using this product
- Wear protective gloves/protective clothing, eye protection/face protection
- Avoid breathing dust/fume/gas/mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Causes skin irritation, serious eye damage
- Contact with internal components may cause irritation or severe burns
- Avoid contact with internal acid
- Irritating to eyes, respiratory system and skin
- Store locked up, in a well ventilated area, in accordance with local and national regulation
- Dispose of contents/container in accordance with local and national regulation
- Keep out of reach of children

SIGNAL WORD: DANGER!

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3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS (CHEMICAL / COMMON NAME)	CAS #	% BY WEIGHT
Lead and Lead Oxide	7439-92-1	60-70
Sulfuric Acid (Electrolyte)	7664-93-9	10-15
Calcium	7440-70-2	<0.15
Tin	7440-31-5	<1
Arsenic (inorganic)	7440-38-2	<1

4. FIRST-AID MEASURES

The AGM batteries are not hazards for eye and skin contact under normal circumstances. In the case of exposure to internal parts of the battery, the following measures should be taken.

Inhalation:

Electrolyte (Sulfuric Acid) – Remove to fresh air immediately. If not breathing give artificial respiration. If breathing is difficult, give oxygen. If breathing difficulty does not improve rapidly, transport to doctor. Consult a doctor.

Lead – remove from exposure, gargle, wash nose and lips; consult a doctor.

Ingestion:

Electrolyte (Sulfuric Acid) – Give large quantities of water, do NOT induce vomiting. Get immediate medical attention.

Lead – Consult doctor immediately.

Skin:

Electrolyte (Sulfuric Acid) – Flush with large amounts of water for at least 15 minutes. Remove contaminated clothing, including shoes. Wash contaminated clothing before reuse, discard contaminated shoes. Seek medical attention if symptoms/irritation persists.

Lead – Wash immediately with soap and water.

Eyes:

Electrolyte (Sulfuric Acid) – Flush immediately with large amounts of water for at least 20 minutes while lifting lids. Seek immediate medical attention.

Lead – Flush immediately with large amounts of water for at least 20 minutes while lifting lids. Seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Flash point – Not Applicable

Flammable Limits in Air % by Volume – Not Applicable

Extinguishing Media – Class ABC, CO₂, Halon; do not use CO₂ directly on cells, avoid breathing vapors

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5. FIRE-FIGHTING MEASURES CONT'D.

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.

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/other sources of ignition near battery.

Unusual Fire and Explosion Hazards

Sulfuric acid vapors are generated upon overcharge and polypropylene case failure. Use adequate ventilation. Avoid open flames/sparks/other sources of ignition near battery. 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 high heat and the possibility of fire. Use adequate ventilation.

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/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 shields/face shield recommended.

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

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 a 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, 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 label). Never use a battery that has less than 80% of rated capacity and never "jump start" an aircraft that has a "dead" or discharged battery. Always remove a "dead"

battery from the aircraft and perform a capacity test to verify airworthiness. Charge at constant potential (constant 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 and 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.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (mg/m³)

CHEMICAL	OSHA PEL/TWA	ACGIH TLV
Lead/Lead Oxide/Lead Sulfate	0.05	0.05
Calcium	Not Established	Not Established
Tin	2	2
Arsenic	0.01	0.01
Arsenic	1.0	1.0

Engineering Controls (Ventilation):

Store and handle in a well-ventilated area. If mechanical ventilation is used, components must be acid-resistant. Charge batteries in areas with adequate ventilation. General dilution ventilation is acceptable.

Respiratory Protection:

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA approved respiratory protection; or when employee experiences respiratory irritation.

Skin Protection:

Wear rubber or plastic acid resistant gloves. Under severe exposure or emergency conditions, wear acid-resistant clothing, gloves and boots.

Eye Protection:

Safety glasses with side shields/face shield recommended.

Other Protection:

Safety shower and eyewash. Chemically impervious apron and face shield recommended when adding water or electrolyte to batteries (not required for sealed, non-spillable batteries)

9. PHYSICAL AND CHEMICAL PROPERTIES

The following information is relevant to ingredients only and is only valid when contents are exposed.

ELECTROLYTE (SULFURIC ACID)		ELECTROLYTE (SULFURIC ACID)	
Vapor Density (Air = 1)	Hydrogen: 0.069 Electrolyte: 3.4 @ STP	Specific Gravity (H ₂ O = 1)	1.250 to 1.320
Solubility in water	100% (electrolyte)	Melting Point	> 320°F (polypropylene)
Boiling point	Not Applicable	Reactivity in Water	Electrolyte – water reactive (1)
pH	< 2	Percent Volatile by Volume	Not Applicable
Evaporation rate (Butyl Acetate = 1)	Not Applicable	Vapor Pressure	Not Applicable
Appearance and Odor: Battery – co-polymer polypropylene, solid; 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 in glass mat material No apparent odor			

10. STABILITY AND REACTIVITY

Stability:
 stable unstable

This product is stable under normal conditions at ambient temperature.

Conditions to avoid:

Avoid overcharging and smoking or sparks near battery surface; high temperatures – cases decompose at >320°F

Incompatibilities: (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.

11. TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling and use.

Acute Toxicity:

	INHALATION	ORAL
Electrolyte (Sulfuric Acid)	LC ₅₀ rat: 375 mg/m ³	LD ₅₀ rat: 2140 mg/kg

Routes of entry:

Inhalation, ingestion, skin or eye contact; harmful by all routes of entry.

Inhalation – breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.

Ingestion – may cause severe irritation of the mouth, throat, esophagus and stomach.

Skin Contact – severe irritation, burns, and ulceration.

Eye Contact – severe irritation, burns, cornea damage and blindness.

Effects of Overexposure (Acute) – severe skin irritation, damage to cornea, upper respiratory irritation.

Effects of Overexposure (Chronic) – possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.

Carcinogenicity – the International Agency for research on Cancer (IARC) has classified “strong inorganic mist containing sulfuric acid” as a Group 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.

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.

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II. TOXICOLOGICAL INFORMATION CONT'D.

Acute Toxicity:

	INHALATION	ORAL
Lead (Elemental)	Acute Toxicity Point Estimate = 4500 ppmV (based on lead bullion)	Acute Toxicity Estimate (ATE) = 500 mg/kg body weight (based on lead bullion)

Routes of entry:

Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume. The presence of nascent hydrogen may generate highly toxic arsine gas.

Inhalation – inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs

Ingestion – 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 – not absorbed through the skin

Eye Contact – may cause eye irritation

Effects of Overexposure (Acute) – symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability

Effects of Overexposure (Chronic) – Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50µg/100mL or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Carcinogenicity – listed by International Agency for Research on Cancer (IARC) as Group 2A, likely in animals at extreme doses. This is approximately equivalent to GHS Category 1B. Proof of carcinogenicity in humans is currently lacking.

Overexposure to lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

All heavy metals, including the hazardous ingredients in this product, are taken into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by adequate precautions such as ventilation and respiratory protection covered in Section 8.

Follow good personal hygiene to avoid inhalation and ingestions: wash hands, face, neck and arms thoroughly before eating, drinking, smoking or leaving the work site. Keep contaminated clothing out of non-contaminated areas, or wear cover clothing when in such areas. Restrict the use and presence of food, tobacco and cosmetics to non-contaminated areas.

Work clothes and work equipment used in contaminated areas must remain in designated areas and never taken home or laundered with personal non-contaminated clothing. This product is intended for industrial use only and should be isolated from children and their environment.

The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction. Risk phrase 61: May cause harm to the unborn child, applies to lead compounds, especially soluble forms.

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12. ECOLOGICAL INFORMATION

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 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 or 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 h LC50, freshwater fish (Brachydanio rerio)	82 mg/L
Sulfuric Acid	96 hr LOEC, freshwater fish (Cyprinus carpio)	22 mg/L
Lead	48 hr LC50 (modeled for aquatic invertebrates)	<1 mg/L (based on lead bullion)

13. DISPOSAL CONSIDERATIONS

Consult national/federal, provincial/state and local regulations for allowed means of disposal.

Waste Management facilities which are licensed to handle them.

Spent batteries:

AGM 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

Following local, provincial/state and national/federal regulations applicable to end of life characteristics will be the responsibility of the end user

14. TRANSPORT INFORMATION

AGM batteries are valve regulated lead acid (VRLA) batteries – HGL, DC, HGHL and FFD series. 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, A164 & A183, and IMDG Special Provisions 238.1 & 238.2. The batteries are securely packaged, protected from short circuits and labeled “Non-Spillable”. VRLA batteries are exempt from DOT Hazardous Material Regulations, IATA Dangerous Goods Regulations and IMDG Code.

DOT:

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

IMO:

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

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14. TRANSPORT INFORMATION CONT'D.**IATA:**

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

And 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 an Air Waybill is issued.

IMDG: Special Provision 238.1 and 238.2

The batteries are exempted from regulation as they have been tested in accordance with the vibration and pressure differential tests and ‘rupture test’ found in Special Provision 238.1 and 238.2

- batteries and their outer packaging must be plainly and durably marked NON-SPILLABLE BATTERY or NON-SPILLABLE
- batteries must be protected against short circuits and securely packaged in accordance with Special Provision 238.1 and 238.2

IF the regulation listed above are not met then ‘batteries, non-spillable’ (UN2800) are regulated as Class 8 Corrosive hazardous materials/dangerous goods by DOT, IATA and IMDG.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products regulations (CPR) and the SDS contains all information required by Controlled Products Regulations.

Distribution within Canada to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

Lead-acid batteries do NOT meet the OSHA definition of an ‘article’ (US EPA, Oct 1998). The lead and acid that compose these batteries must be included when determining the various thresholds for these EPCRA (Emergency Planning & Community Right-to-Know Act) section regulations. The acid in lead-acid batteries is sulfuric acid, which is an Extremely Hazardous Substance (EHS). The following table outlines the applicable EPCRA sections and their respective thresholds for sulfuric acid:

EPCRA SECTIONS	THRESHOLDS
302 – Emergency Planning Notification	TPQ ≥ 1000 lbs
304 – Emergency Release Notification	RQ ≥ 1000 lbs
311 – MSDS Reporting	*TPQ ≥ 500 lbs
312 – Chemical Inventory Reporting (i.e. Tier II)	*TPQ ≥ 500 lbs

*The reporting threshold for sulfuric acid is ≥ the designated TPQ (Threshold Planning Quantity) or 500 lbs, whichever is less.

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15. REGULATORY INFORMATION CONT'D.

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:

EPCRA SECTIONS	THRESHOLDS
311 – MSDS Reporting	≥ 10,000 lbs
312 – Chemical Inventory Reporting (i.e. Tier II)	≥ 10,000 lbs

EPCRA Section 313:

The reporting of lead and sulfuric acid (and their releases) in lead-acid batteries used in cars, trucks, most cranes, forklifts, locomotive engines and aircraft for the purposes of EPCRA Section 313 is not required. Lead-acid batteries used for these purposes are exempt for section 313 reporting per the “Motor Vehicle Exemption”. See page B-22 of the US EPA Guidance Document for Lead and Lead Compound Reporting under EPCRA Section 313 for additional information of this exemption.

Supplier Notification:

This product contains toxic chemicals that may be reportable under EPCRA Section 313 Toxic Chemical release Inventory (Form R) requirements. For a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:

TOXIC CHEMICAL	CAS NUMBER	APPROXIMATE % BY WEIGHT
Lead	7439-92-1	65-75
Electrolyte (Sulfuric Acid)	7664-93-9	16-21

California 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.

Distribution into the EU to follow applicable Directives to the Use, Import / Export of the product as-sold.

16. OTHER INFORMATION

NFPA Hazard rating for sulfuric acid:

Flammability (Red) = 0

Health (Blue) = 3

Reactivity (Yellow) = 2

Disclaimer:

This Safety Data Sheet is based upon information and sources available at the time of preparation or revision. The information was obtained from sources believed to be reliable, however, not under our supervision or control.

Surrette Battery Company Limited makes no Warranty of Merchantability or any other warranty, expressed or implied, with respect to such information and we assume no responsibility resulting from its use. The data contained in this SDS is offered for your information, consideration and investigation. The guidelines for the safe handling and use of this product provided do not and cannot advise on every possible situation and use of this product should be assessed to determine if additional precautions are required. It is the responsibility of each user of this product to determine the suitability of this product and adhere to the requirements of all applicable laws regarding use, transport and disposal of this product.