



Safety Data Sheet

Lead-Acid Battery, Wet Electrolyte (Sulfuric Acid)

Section 1 – Identification

Product Identifier: Lead-Acid Battery, Wet Electrolyte (Sulfuric Acid) Product Use: Rechargeable Electrical Storage	Manufacturer: <i>U.S. Battery Manufacturing Company</i> Primary Addresses: 1675 Sampson Ave. Corona, CA 92879 1895 Tobacco Rd. Augusta, GA 30906
General Info: 951-371-8090 (M-F, 9AM-5PM EST) Contact: Health & Safety Department	Emergency: US & Canada: 800-535-5053 (INFOTRAC) International: +1-352-323-3500

Section 2 – Hazards Identification

2.1 - Classification

Physical	Health	Environmental
Explosive: Division 1.3	Acute Toxicity: Category 4 ¹	Aquatic Hazard: Acute 1
	Skin Corrosion: Category 1A	Aquatic Hazard: Chronic 1
	Eye Damage: Category 1	
	Carcinogenicity: Category 1	
	Infertility: Category 1	
	STOT ² : Category 1	

Notes: 1. Hazard Category 4 in **oral, dermal, & inhalation**.
2. Specific Target Organ Toxicity following single exposure.

2.2 – Label Elements



Signal Word: DANGER

Hazard Statements

H203	Explosive; fire, blast, or projection hazard
H302/312/332	Harmful if swallowed, inhaled, or in contact with skin
H314	Causes severe skin burns and eye damage
H350	May cause cancer if ingested or inhaled
H360	May damage fertility or unborn children if ingested or inhaled
H370	Damages organs (blood, central nervous system, kidneys) through prolonged/repeated exposure
H410	Very toxic to aquatic life with long lasting effects
N/A	May form explosive gas (hydrogen) during charging

Precautionary Statements

P210	Keep away from heat, hot surfaces, sparks, open flames & other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P262	Do not get contents in eyes, on skin, or on clothing.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using (handling) this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301/330/331	IF SWALLOWED: Do NOT induce vomiting. Rinse mouth.
P303/361/353	IF ON SKIN (or hair): Immediately take off all contaminated clothing. Rinse skin with water.
P304/340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305/351/338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses (if present & easy to do). Continue rinsing.
P310	Immediately call a POISON CENTER (in US: 800-222-1222) or doctor.
P391	Collect spillage.
P403	Store in a well-ventilated place.
P405	Store locked up.
P502	Refer to supplier for information on recovery or recycling.

Section 3 – Composition / Information on Ingredients

Ingredients	CASRN ¹	% by Weight
Elemental Lead (Pb); and the following inorganic compounds: Lead(IV) oxide (PbO ₂), also known as <i>lead dioxide</i> Lead(II) sulfate (PbSO ₄)	7439-92-1 1309-60-0 7446-14-2	43-70 ²
Sulfuric Acid	7664-93-9	20-44
Antimony	7440-36-0	0.4-1.25

Notes: 1. Chemical Abstracts Service Registry Number (i.e., CAS#)
2. Varies according to state of charge/discharge.

Section 4 – First-Aid Measures

Following inhalation	Sulfuric Acid: Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult physician. Lead: Remove from exposure, gargle, wash nose & lips. Consult physician.
Following skin contact	Sulfuric Acid: Immediately rinse with a large amount of cool water. Rinsing within 1 minute of the burn can reduce risk of complications. Flush area for at least 20 minutes. Do not use a hard spray of water, because it can damage burned area. As you flush the area, take off any clothing or jewelry that has the chemical on it. Consult physician. Lead: Avoid inhalation/ingestion. Wash affected area with soap & water for at least 60 seconds.
Following eye contact	Sulfuric Acid: Flush immediately with large amounts of water for at least 15 minutes while lifting eyelids. Seek immediate medical attention if eyes have been directly exposed to acid.
Following ingestion	Sulfuric Acid: Do NOT induce vomiting. Give large quantities of water. Consult physician. Lead: Consult physician.

Section 5 – *Firefighting Measures*

Suitable extinguishing media	CO ₂ ; foam; dry chemical. Do not use carbon dioxide directly on cells. Use appropriate media for surrounding fire.
Specific hazards	Hydrogen gas is generated during battery charging & operation. If ignited, batteries may explode dispersing casing fragments & acid.
Special protective equipment & precautions	<p>Avoid breathing vapors. Use positive pressure self-contained breathing apparatus (SCBA). Beware of acid splatter during water application; wear acid-resistant clothing, gloves, face & eye protection.</p> <p>Avoid all ignition sources. Do not allow metallic articles to simultaneously contact negative & positive terminals of a battery.</p> <p>If batteries are on charge, shut off power to charging equipment; but note that series-connected batteries may still pose risk of electric shock even when charging equipment is shut down.</p>

Section 6 – *Accidental Release Measures*

Personal precautions & protective equipment	Wear acid-resistant clothing, boots, gloves, & face shield.
Emergency procedure, containment, & cleanup	Stop flow of electrolyte, contain/absorb small spills with dry sand, earth, or vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc.
Environmental precautions	<p>Dispose of as a hazardous waste in accordance with applicable regulations.</p> <p>Do not discharge un-neutralized acid to sewer; acid must be managed in accordance with applicable regulations.</p>

Section 7 – *Handling & Storage*

Precautions for safe handling	<p>Except during recycling operations, do not breach casing or empty contents of battery. Avoid tipping, which may allow acid leakage. Keep containers tightly closed when not in use. If battery case is broken, avoid contact with internal components. Keep vent caps on and cover terminals to prevent short circuits. Place cardboard between layers of stacked batteries to avoid damage & short circuits. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers & water. Use banding or stretch wrap to secure items for shipping.</p> <p>There is risk of electric shock from charging equipment & 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 & release flammable hydrogen gas. Ventilate charging space. Prohibit smoking and avoid creation of flames & sparks nearby. Wear face & eye protection when near charging batteries.</p> <p>Follow recommended maximum charging currents & operating temperature range. Do not overcharge beyond recommended upper charging voltage limit.</p>
Conditions for safe storage	Store batteries under roof in cool, dry, well-ventilated areas away from incompatible materials & activities that may create flames, spark, or heat. Store on smooth, impervious surfaces provided with measures for liquid containment in the event of electrolyte spill. Keep away from metallic objects that could bridge battery terminals creating short-circuits. Never recharge batteries in an unventilated, enclosed space.

Section 8 – Exposure Control / Personal Protection

	Ingredient	CASRN	Limit	Value
Control parameters	Lead (Pb)	7439-92-1	TWA	0.05 mg/m ³
	Lead(IV) oxide (PbO ₂)	1309-60-0	TWA	0.05 mg/m ³
	Lead(II) sulfate (PbSO ₄)	7446-14-2	TWA	0.05 mg/m ³
	Sulfuric Acid (H ₂ SO ₄)	7664-93-9	PEL	1 mg/m ³
Engineering controls	Store, handle, & charge in well-ventilated area. Ensure vent caps are secured. If battery case is damaged, avoid contact with internal components. Do not allow metal to simultaneously contact both positive & negative terminals of batteries. Where sulfuric acid solutions are handled in concentrations > 1%, provide emergency eyewash stations & showers with unlimited water supply. Chemically impervious apron & face shield are recommended when adding water or electrolyte to batteries.			
Individual protection measures	Wear protective clothing, including eye protection, when filling, charging, or handling batteries. If battery case is damaged, use acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing & boots. If necessary to handle damaged product (where exposure to electrolyte is a possibility), chemical splash goggles & face shield are recommended.			

Section 9 – Physical & Chemical Properties

(a) Appearance	Plastic encasement
(b) Odor	Electrolyte is pungent (i.e., has a sharp odor).
(c) Odor threshold	Electrolyte (sulfuric acid): ~ 1 mg/m ³ in air
(d) pH	Electrolyte (sulfuric acid): ~ 1
(e) Melting point (lead plates) Freezing point (electrolyte)	Lead: ~ 620°F Electrolyte (approx.): -90°F (fully charged) 30°F (discharged)
(f) Initial boiling point & boiling range	Electrolyte (approx.): 203°F
(g) Flash point	Not applicable
(h) Evaporation rate	< 1
(i) Flammability (solid, gas)	Flammable gas
(j) Upper/lower flammability/explosive limits	Hydrogen in air: LFL/LEL = 4%; UFL/UEL = 75%
(k) Vapor pressure (mm Hg @ 20°C)	Partial pressure of sulfuric acid: 0.001
(l) Vapor density	3.4
(m) Relative density (i.e., specific gravity)	1.145 - 1.345
(n) Solubility	Electrolyte/Acid (100%); Lead (0%)
(o) Partition coefficient:	Not applicable
(p) Auto-ignition temperature	Not applicable
(q) Decomposition temperature	Not applicable
(r) Viscosity	Not applicable

Section 10 – *Stability & Reactivity*

Reactivity/Stability	Stable under normal conditions at ambient temperature.
Conditions to avoid	Ignition sources; high temperature; overcharging.
Incompatible materials	Electrolyte (sulfuric acid): Contact with combustibles or organic material may cause fire/explosion. May react violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, & water.
Hazardous decomposition products	Electrolyte (sulfuric acid): Contact with metal may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas. Lead compounds: Temperatures above the melting point may produce toxic fumes.

Section 11– *Toxicological Information*

Under normal conditions/use, exposure to toxic material is not expected. The following information is provided for acid or lead exposure that may occur due to container breakage or under extreme conditions such as fire.

<u>Exposure Routes</u>	<u>Information</u>
1. Inhalation	1. Sulfuric Acid: breathing vapors or mists may cause severe respiratory irritation. Lead Compounds: inhalation of dust/fumes may irritate respiratory tract & lungs.
2. Ingestion	2. Sulfuric Acid: severe irritation of mouth, throat, esophagus and stomach. Lead Compounds: acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea & severe cramping. A physician must treat this.
3. Skin	3. Sulfuric Acid: severe irritation, burns, & ulceration. Lead Compounds: not absorbed through skin.
4. Eye	4. Sulfuric Acid: severe irritation, burns, cornea damage, & blindness. Lead Compounds: may cause eye irritation.
Symptoms of overexposure: Acute/Chronic effects	<u>Acute effects</u> 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 <u>Chronic effects</u> Sulfuric Acid: inflammation of nose, throat & bronchial tubes. Lead Compounds: anemia; damage to blood-forming tissues; neuropathy (particularly of motor nerves); kidney damage; reproductive changes (males & females). Heavy exposure may result in central nervous system damage.
Carcinogenicity	Sulfuric Acid: The International Agency for Research on Cancer classified <i>strong inorganic acid mist containing sulfuric acid</i> as a Category I carcinogen. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Acid mist is not generated under normal use; however, misuse, such as overcharging, may result in generation of sulfuric acid mist. Lead Compounds: IARC lists lead as Group 2A - likely in animals at extreme doses. Per OSHA 29 CFR 1910.1200 App F, this is approximately equivalent to GHS Category 1B.
Toxicity	Sulfuric acid: LD ₅₀ = 2140 mg/kg (Rat); LC ₅₀ = 375 mg/m ³ (Rat) Lead: Acute Toxicity Estimate (ATE) = 500 mg/kg Antimony: LD ₅₀ = 100 mg/kg (Rat)

Section 12 – Ecological Information

Ecotoxicity	Sulfuric acid: 24-hr LC ₅₀ (freshwater fish): 82 mg/L Lead: 48-hr LC ₅₀ (aquatic invertebrates): < 1 mg/L
Persistence & Degradability	Lead is very persistent in soil & sediments. No data on environmental degradation.
Bioaccumulative Potential	Bioaccumulation of lead occurs in aquatic & terrestrial animals & plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds rather than elemental lead.
Mobility in Soil	Mobility of elemental lead between ecological compartments is slow.
Other adverse effects	No known effects on atmospheric ozone.

Section 13- Disposal Considerations

Reclamation / Recycle	Spent lead-acid batteries are completely recyclable (99% of all lead-acid batteries are recycled) and should be reclaimed rather than disposed of as waste. Most retailers that sell lead-acid batteries collect used batteries for recycling, as required by state laws. Reclaimed lead-acid batteries are exempt from hazardous waste management requirements in accordance with 40 CFR 266 Subpart G – <i>Spent Lead-Acid Batteries Being Reclaimed</i> . Otherwise, spent lead-acid batteries fall under Universal Waste Regulations of 40 CFR 273 – <i>Standards for Universal Waste Management</i> .
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Section 14 – Transport Information

UN number	UN2794
Proper shipping name	Batteries, wet, filled with acid, electric storage
Transport hazard class	Class 8, Corrosive hazardous materials
Packing group	PGIII
Environmental hazards	No
Special precautions	The following DOT transportation requirements do not apply to <i>installed</i> batteries. 49 CFR 173.59 regulates transport of wet spillable batteries: When transported by highway or rail, electric storage batteries containing electrolyte or corrosive battery fluid are not subject to any other requirements of this subchapter, if all the following requirements are met: (1) No other hazardous materials are transported in the same vehicle; (2) Batteries are loaded/braced so as to prevent damage & short circuits in transit; (3) Any other material loaded in the same vehicle is blocked, braced, or otherwise secured to prevent contact with (or damage to) batteries; and (4) Transport vehicle carries only material shipped by the battery shipper. If any requirements are not met, batteries must be shipped as hazardous materials.

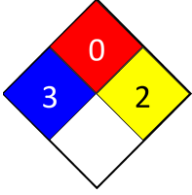
Section 15 - Regulatory Information

US Federal	<p>RCRA: Spent batteries are subject to reduced requirements when managed in compliance with 40 CFR 266.80 or 40 CFR 273. If applicable; EPA hazardous waste numbers are D002 (corrosivity) and D008 (lead).</p> <p>EPA SARA Title III:</p> <p>Section 302 EPCRA <i>Extremely Hazardous Substances</i> (EHS): Sulfuric acid is a listed EHS under EPCRA, with a Threshold Planning Quantity (TPQ) of 1000 lbs. EPCRA Section 302 notification is required if 500 lbs. or more of sulfuric acid is present at one site (40 CFR 370.10). For more information consult 40 CFR Part 355.</p> <p>Section 304 CERCLA Hazardous Substances: Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning & Community Right-to-Know Act) is 1000 lbs. State & local reportable quantities for spills may vary.</p> <p>Section 311/312 Hazard Categorization: EPCRA Section 312 Tier II reporting is required for non-automotive batteries if sulfuric acid is present in quantities of 500 lbs. or more or lead is present in quantities of 10,000 lbs. or more. For more information consult 40 CFR 370.10 and 40 CFR 370.40.</p> <p>Section 313 EPCRA <i>Toxic Substances</i>: 40 CFR Section 372.38(b) states: If toxic chemical is present in an article at a covered facility, a person is not required to consider the quantity of the toxic chemical present in such article when determining whether an applicable threshold has been met under 40 CFR's 372.25, 372.27, or 372.28 or determining the amount of release to be reported under 40 CFR 372.30. This exemption applies whether the person received the article from another person or the person produced the article. However, this exemption applies only to the quantity of the toxic chemical present in the article.</p> <p>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 EPA's <i>Guidance Document for Lead & Lead Compound Reporting under EPCRA Section 313</i> for additional information.</p>
California	<p>Proposition 65 Warning: Battery posts, terminals, & related accessories contain lead & lead compounds, chemicals known to California to cause cancer & reproductive harm. Batteries also contain <i>other</i> chemicals known to California to cause cancer. Wash hands after handling.</p>

Section 16 - Other Information

SDS originally prepared: 10 September 2013.

SDS last revised (entire document): 18 September 2015.

NFPA Rating:	DOT Rating:
 <p>Sulfuric Acid</p>	