



MATERIAL SAFETY DATA SHEET

Revised 11/93

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I. PRODUCT IDENTIFICATION

Chemical/Trade Name (as used on label)

Lead-Acid Battery

Chemical Family/Classification

Electric Storage Battery

Manufacturer's Name/AddressYuasa-Exide, Inc.
645 Penn Street
Reading, PA 19601TelephoneFor information and emergencies, contact Yuasa-Exide.,
Environmental Resources Dept. (215) 371-0400.24-hour Emergency Response Contact:
CHEMTREC (800) 424-9300

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

<u>Components</u>	<u>CAS Number</u>	<u>Approximate % by Wt. or Vol.</u>	<u>Air Exposure Limits (ug/m³)</u>		
			<u>OSHA</u>	<u>ACGIH</u>	<u>NIOSH</u>
Inorganic lead compound:					
Lead	7439-92-1	60	50	150	100
Antimony	7440-36-0	2	500	500	--
Arsenic	7440-38-2	0.2	10	200	--
Calcium	7440-70-2	0.2	--	--	--
Tin	7440-31-5	0.2	2000	2000	--
Electrolyte (sulfuric acid)	7664-93-9	10-30	1000	1000	1000
Case Material:		5-10	N/A	N/A	N/A
Polypropylene	9003-07-0				
Polystyrene	9003-53-6				
Styrene Acrylonitrile	9003-54-7				
Acrylonitrile Butadiene Styrene	9003-56-9				
Styrene Butadiene	9003-55-8				
Polyvinylchloride	9002-86-2				
Polycarbonate	--				
Hard Rubber	--				
Polyethylene	--				
Other					
Silicon dioxide (gel cell batteries only)	60676-86-0	10	N/A	N/A	N/A
Sheet Molding Compound (glass-reinforced polyester)	--	10	N/A	N/A	N/A

NOTE: Inorganic lead and electrolyte (sulfuric acid) are the primary components of every battery manufactured by Yuasa-Exide, Inc. Other ingredients may be present dependent upon battery type. Contact your Yuasa-Exide representative for additional information.

645 Penn Street Reading, PA 19601
P.O. Box 14145 Reading, PA 19612-4145
215/371-0400

III. PHYSICAL DATA

Electrolyte:

<u>Boiling Point:</u>	203°F	<u>Specific Gravity (H₂O = 1):</u>	1.215 to 1.350
<u>Melting Point:</u>	Not Applicable	<u>Vapor Pressure (mm Hg):</u>	10
<u>Solubility in Water:</u>	100%	<u>Vapor Density (AIR = 1):</u>	Greater than 1
<u>Evaporation Rate</u> (Butyl acetate = 1)	Less Than 1	<u>% Volatiles by Weight:</u>	Not Applicable

Appearance and Odor: Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable Flammable Limits: LEL = 4.1% (Hydrogen Gas) UEL = 74.2%

Extinguishing media: CO₂; foam; dry chemical

Special Fire Fighting Procedures: If batteries are on charge, shut off power. Use positive pressure, self-contained breathing apparatus. Water applied to electrolyte generates heat and causes it to spatter. Wear acid-resistant clothing.

Unusual Fire and Explosion hazards: Highly flammable hydrogen gas is generated during charging and operation of batteries. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic materials to simultaneously contact negative and positive terminals of cells and batteries. Follow manufacturer's instructions for installation and service.

V. REACTIVITY DATA

Stability: Stable X
 Unstable

Conditions to Avoid: Prolonged overcharge; sources of ignition.

Incompatibility: (materials to avoid)

Sulfuric acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, 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, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.

Hazardous Decomposition Products:

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

VI. HEALTH HAZARD DATA**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.

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, blindness.

Lead compounds: 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 both 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.

Arsenic: Listed by National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

VI. HEALTH HAZARD DATA (Continued)

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 skin diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

Emergency and First Aid Procedures:

Inhalation:

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

Lead: 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: Consult physician immediately.

Skin:

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

Lead: Wash immediately with soap and water.

Eyes:

Sulfuric acid and lead: Flush immediately with large amounts of water for at least 15 minutes; consult physician.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Spill or Leak Procedures:

Stop flow of material, contain/absorb small spills with dry sand, earth, 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 unneutralized acid to sewer.

Waste Disposal Methods:

Spent batteries: Send to secondary lead smelter for recycling.

Place neutralized slurry into sealed containers and dispose of as hazardous waste, as applicable. Large water-diluted spills, after neutralization and testing, should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.

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.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (Continued)Precautionary Labelling:

POISON - CAUSES SEVERE BURNS

DANGER - CONTAINS SULFURIC ACID

VIII. CONTROL MEASURESEngineering 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 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 or emergency conditions, wear acid-resistant clothing and boots.

Emergency Flushing:

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

IX. OTHER REGULATORY INFORMATIONNFPA Hazard Rating for sulfuric acid:

Flammability (Red)	=	0
Health (Blue)	=	3
Reactivity (Yellow)	=	2

Sulfuric acid is water-reactive if concentrated.

U.S. DOT: Wet (filled with electrolyte) batteries are regulated by U.S. DOT as hazardous material.

Proper Shipping Name: Batteries, wet, filled with acid

Hazard Class/Division: 8

ID Number: UN2794

Packing Group: III

Label Required: Corrosive

OTHER REGULATORY INFORMATION (Continued)**U.S. DOT (Continued)**

Note: Yuasa-Exide batteries which have met the test requirements for "non-spillable wet electric storage batteries", as provided in 49 CFR 173.159(d), are non-regulated by DOT when protected against short circuits and securely packaged. Contact your Yuasa-Exide representative to determine which non-spillable batteries have met these requirements.

If non-spillable wet electric storage batteries have not met these requirements, the following information would apply:

Proper Shipping Name: Batteries, wet, non-spillable
 Hazard Class/Division: 8
 ID Number: UN2800
 Packing Group: III
 Label Required: Corrosive

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 P002 (corrosivity).

CERCLA (Superfund) and EPCRA:

- (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. The quantity of sulfuric acid will vary by battery type. Contact your Yuasa-Exide representative for additional information.
- (d) EPCRA Section 312 Tier 2 reporting is required for 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.
- (e) **Supplier Notification:** This product contains toxic chemicals which may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. If you are a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:

<u>Toxic Chemical</u>	<u>CAS Number</u>	<u>Approximate % by Weight</u>
Lead	7439-92-1	60
Sulfuric Acid	7664-93-9	10-30
• Antimony	7440-36-0	2
• Arsenic	7440-38-2	0.2

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year.

Note: The Section 313 supplier notification requirement does not apply to batteries which are "consumer products".

- Not present in all battery types. Contact your Yuasa-Exide representative for additional information.

IX OTHER REGULATORY INFORMATION (Continued)**TSCA**

Ingredients in Yuasa-Exide's batteries are listed in the BCA Registry as follows:

	<u>CAS No.</u>	<u>BCA Status</u>
<u>Electrolyte</u>		
Sulfuric Acid (H_2SO_4)	7664-93-9	Listed
<u>Inorganic Lead Compound</u>		
Lead (Pb)	7439-92-1	Listed
Lead Oxide (PbO)	1317-36-8	Listed
Lead Sulfate ($PbXO_4$)	7446-14-2	Listed
Antimony (Sb)	7440-36-0	Listed
Arsenic (As)	7440-32-2	Listed
Calcium (Ca)	7440-70-2	Listed
Tin (Sn)	7440-31-5	Listed

CAA

Yuasa-Exide, Inc. supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFC's and other ozone depleting chemicals (ODC's), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, Yuasa-Exide, Inc. established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.