



MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION		
MANUFACTURER Exide Technologies 13000 Deerfield Parkway, Bldg. 200 Alpharetta, GA 30004	CHEMICAL/TRADE NAME (as used on label)	Lead-Acid Battery
FOR INFORMATION (610) 921-4052 Fred Ganster, Environmental, Safety & Health	CHEMICAL FAMILY/ CLASSIFICATION	Electric Storage Battery
FOR EMERGENCY CHEMTREC (800) 424-9300 24-hour Emergency Response Contact Ask for Environmental Coordinator	DATE ISSUED:	October 1, 2001 Page 1 of 5
CHEMTREC INTERNATIONAL (703) 527-3887 – Collect		

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION					
		Approximate Air Exposure Limits (µg/m ³)			
Components	CAS Number	% by Wt.	OSHA	ACGIH	NIOSH
Inorganic compounds of:					
Lead	7439-92-1	54-62	50	150	100
Antimony	7440-36-0	0.4	500	500	-
Tin	7440-31-5	0.16	2000	2000	-
Calcium	7440-70-2	0.02	-	-	-
Arsenic	7440-38-2	0.01	10	200	-
Electrolyte (sulfuric acid/water/solution)	7664-93-9	26-40	1000	1000	1000
Case Material:					
Polypropylene	9003-07-0	5-12	N/A	N/A	N/A
Hard Rubber	--				
Plate separator material:					
Polyethylene	9002-88-4	1-2	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 Exide Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type. Polypropylene is the principal case material of automotive and commercial batteries.

III. PHYSICAL DATA - ELECTROLYTE			
Boiling Point	203° F-240° F (for S.G. range)	Specific Gravity (H ₂ O=1)	1.230 to 1.350
Melting Point	Not Applicable	Vapor Pressure (mm Hg) 77° F	17 to 11 (for S.G. range)
Solubility in Water	100%	Vapor Density (AIR=1)	Greater than 1
Evaporation Rate (Butyl acetate=1)	Less Than 1	% Volatiles by Weight	Not Applicable
Appearance and Odor	A clear liquid with a sharp, penetrating, pungent odor. A battery is a manufactured article; no apparent odor.		

IV. FIRE AND EXPLOSION HAZARD DATA	
Flash Point:	Not Applicable
Flammable Limits:	LEL = 4.1% (Hydrogen Gas in air) ; UEL = 74.2%
Extinguishing media:	CO ₂ ; foam; dry chemical

Special Fire Fighting Procedures: Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

IV. FIRE AND EXPLOSION HAZARD DATA (CONTINUED)

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.

V. REACTIVITY DATA

Stability: Stable X
Unstable

Conditions to Avoid: Prolonged overcharge at high current; sources of ignition.

Incompatibility: (materials to avoid)

Electrolyte: 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:

Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.

Lead compounds: Temperatures above the melting point are 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:

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.

VI. HEALTH HAZARD DATA (CONTINUED)

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 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.

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

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 neurologic 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.

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.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storage:

Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities that may create flames, spark, or heat. Store on smooth, impervious surfaces that are provided with measures for liquid containment in the event of electrolyte spills. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit. Handle carefully and avoid tipping, which may allow electrolyte leakage. Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units.

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.

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.** Neutralized acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

Waste Disposal Methods:

Spent batteries: Send to secondary lead smelter for recycling.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (CONTINUED)

Electrolyte: Place neutralized slurry into sealed acid resistant 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.

Precautionary Labeling:

POISON - CAUSES SEVERE BURNS
DANGER - EXPLOSIVE GASES

CORROSIVE - CONTAINS SULFURIC ACID
KEEP AWAY FROM CHILDREN

VIII. CONTROL MEASURES

Engineering Controls and Work Practices:

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant. Handle batteries cautiously, do not tip to avoid spills. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when filling, charging, 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, gloves, and boots.

Emergency Flushing:

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

IX. OTHER REGULATORY INFORMATION

NFPA Hazard Rating for sulfuric acid:

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

Sulfuric acid is water-reactive if concentrated.

TRANSPORTATION: Wet (filled with electrolyte) batteries are regulated by U.S. DOT as a hazardous material, as provided in 49 CFR 173.159

Proper Shipping Name:	Battery, wet, filled with acid
Hazard Class/Division:	8
ID Number:	UN2794
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 D002 (corrosivity).

CERCLA (Superfund) and EPCRA:

- 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.
- Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of **1,000 lbs**.
- 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 Exide representative for additional information.
- 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.