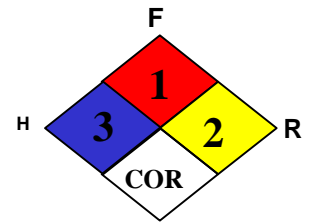




HAZARD RATING



Storage Battery Systems
VALVE REGULATED LEAD ACID BATTERY

MATERIAL SAFETY DATA SHEET

SECTION 1-- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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| MANUFACTURER'S NAME: Storage Battery Systems, Inc. | EMERGENCY TELEPHONE NO.: CHEMTREC 800-424-9300 |
| ADDRESS: N56 W16665 Ridgewood Dr. Menomonee Falls, WI 53051 | OTHER INFORMATION CALLS: 262-703-5800 800-554-2243 |
| PERSON RESPONSIBLE FOR PREPARATION: Scott Rubenzer -- President | Revision Date: October 16, 2002 |

SECTION 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

| C.A.S. | PRINCIPAL HAZARDOUS COMPONENT(S) (chemical & common name(s)) | Hazard Category | % Weight | ACGIH TLV - mg/m ³ | OSHA PEL/TWA - mg/m ³ |
|----------------|---|-------------------------------------|----------|-------------------------------|----------------------------------|
| 7439-92-1 | Lead/Lead Oxide (Litharge)/Lead Sulfate | Acute-Chronic | 60-90 | 0.05 mg/m ³ | 0.05 mg/m ³ |
| 7440-70-2 | Calcium (lead calcium alloy) | Reactive | <0.1 | Not Established | Not Established |
| 7440-31-5 | Tin | Chronic | <0.5 | 2 | Not Established |
| 7440-38-2 | Arsenic (inorganic) | Acute-Chronic | <0.1 | 0.01 | 0.01 |
| 7664-93-9 | Sulfuric Acid (Battery Electrolyte) | Reactive-Oxidizer Acute -Chronic | 10-30 | 1.0 | 1.0 |
| Not applicable | Inert Ingredients | Not applicable | <6 | Not Applicable | Not Applicable |

Note: PEL's for Individual states may differ from OSHA's PEL's. Check with local authorities for the applicable state PEL's.
 OSHA – Occupational Safety and Health Administration; ACGIH – American Conference of Governmental Industrial Hygienists; NIOSH – National Institute for Occupational Safety and Health.

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| COMMON NAME: (Used on label) (Trade Name & Synonyms) Battery, Valve Regulated Non-Spillable (VRLA) | Chemical Family: Toxic and Corrosive Material Mixture |
| Chemical Name: Battery, Storage, Lead Acid, Valve Regulated | Formula: Lead/Acid |

SECTION 3 -- HAZARD IDENTIFICATION

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| Signs and Symptoms of Exposure | 1. Acute Hazards | Do not open battery. Avoid contact with internal components. Internal components include lead and gelatinous electrolyte. Electrolyte - Electrolyte is corrosive and contact may cause skin irritation and chemical burns. Electrolyte causes severe irritation and burns of eyes, nose and throat. Ingestion can cause severe burns and vomiting. Lead - Direct skin or eye contact may cause local irritation. Inhalation or ingestion of lead dust or fumes may result in headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia and leg, arm and joint pain. |
| | 2. Subchronic and Chronic Health Effects | Electrolyte - Repeated contact with electrolyte causes irritation and skin burns. Repeated exposure to mist may cause erosion of teeth, chronic eye irritation and/or chronic inflammation of the nose, throat and lungs. Lead – Prolonged exposure may cause central nervous system damage, gastrointestinal disturbances, anemia, wrist-drop and kidney dysfunction. Pregnant women should be protected from excessive exposure to prevent lead from crossing the placental barrier and causing infant neurological disorders. 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. |
| Medical Conditions Generally Aggravated by Exposure | Contact with internal components if battery is broken or opened, then persons with the following medical conditions must take precautions: pulmonary edema, bronchitis, emphysema, dental erosion and tracheobronchitis. | |
| Routes of Entry | Inhalation - YES Ingestion – YES | Eye Contact- YES |

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|--|----------------------|-----------------------------------|---------------------------|---------------|------------------|------------------|
| Chemical(s) Listed as Carcinogen or potential Carcinogen | Proposition 65 - YES | National Toxicology Program - YES | I.A.R.C. Monographs - YES | O.S.H.A. - NO | E.P.A. CAG - YES | N.I.O.S.H. - YES |
|--|----------------------|-----------------------------------|---------------------------|---------------|------------------|------------------|

SECTION 4 -- FIRST AID MEASURES

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| Emergency and First Aid Procedures | Contact with internal components if battery is opened/broken. |
| 1. Inhalation | Remove to fresh air and provide medical oxygen/CPR if needed. Obtain medical attention. |
| 2. Eyes | Immediately flush with water for at least 15 minutes, hold eyelids open. Obtain medical attention. |
| 3. Skin | Flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary. |
| 4. Ingestion | Do not induce vomiting. If conscious drink large amounts of water/milk. Obtain medical attention. Never give anything by mouth to an unconscious person. |

SECTION 5 -- FIREFIGHTING MEASURES

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| Flash Point – Not Applicable | Flammable Limits in Air % by Volume: Not Applicable | Extinguishing Media – Class ABC, CO ₂ , Halon | Auto-Ignition 675°F (polypropylene) Temperature |
| Special 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. | | |
| 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. | | |

SECTION 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 contaminated material in accordance with applicable local, state and federal 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.

SECTION 7 -- HANDLING AND STORAGE

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| 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 cool, dry, well-ventilated areas. Batteries should be stored under roof for protection against adverse weather conditions. Avoid damage to containers. |
| 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. |

SECTION 8 -- EXPOSURE CONTROLS AND PERSONAL PROTECTION

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| Respiratory Protection (Specify Type) | None required under normal conditions. Acid/gas NIOSH approved respirator is required when the PEL is exceeded or employee experiences respiratory irritation. | | | | |
| Ventilation | Store and handle in dry ventilated area. | Local Exhaust | When PEL is exceeded. | Mechanical (General) | Not Applicable |
| Protective Gloves | Wear rubber or plastic acid resistant gloves. | | Eye Protection | ANSI approved safety glasses with side shields/face shield recommended | |
| Other Protective Clothing or Equipment | Safety shower and eyewash. | | | | |

SECTION 9 -- PHYSICAL AND CHEMICAL PROPERTIES

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| Boiling Point: Not Applicable | Vapor Pressure: Not Applicable | Specific Gravity: 1.250-1.320 | pH <2 | Melting Point: <320°F (polypropylene) |
| Percent Volatile By Volume: Not Applicable | Vapor Density | Hydrogen: 0.069 (Air = 1) | Electrolyte: 3.4 @ STP (Air = 1) | Evaporation Rate: Not applicable |
| Solubility In water: 100% soluble (electrolyte) | Reactivity in Water: Electrolyte – Water Reactive (1) | | | |
| Appearance and Odor: | Battery: Polypropylene or hard rubber case, solid. Lead: Gray, metallic, solid. Electrolyte: Odorless, white gelatinous semi-solid (absorbed). No apparent odor. | | | |

SECTION 10 -- STABILITY AND REACTIVITY

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| Stability: Stable | Conditions to Avoid: Avoid overcharging and smoking, or sparks near battery surface. High temperatures-cases decompose at <320°F. |
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| Incompatibility (Materials to Avoid) | Sparks, open flames, keep battery away from strong oxidizers. |
| Hazardous Decomposition Products | Combustion can produce carbon dioxide and carbon monoxide. |
| Hazardous Polymerization | Hazardous Polymerization has not been reported. |

SECTION 11 -- TOXICOLOGICAL INFORMATION

GENERAL: The primary routes of exposure to lead are ingestion or inhalation of dust and fumes.

ACUTE:

INHALATION/INGESTION: Exposure to lead and its compounds may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, and pain in the legs, arms and joints. Kidney damage, as well as anemia, can occur from acute exposure.

CHRONIC:

INHALATION/INGESTION: Prolonged exposure to lead and its compounds may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia, and wrist drop. Symptoms of central nervous system damage include fatigue, headaches, tremors, hypertension, hallucination, convulsions and delirium. Kidney dysfunction and possible injury has also been associated with chronic lead poisoning. Chronic over-exposure to lead has been implicated as a causative agent for the impairment of male and female reproductive capacity, but there is at present, no substantiation of the implication. Pregnant women should be protected from excessive exposure. Lead can cross the placental barrier and unborn children may suffer neurological damage or developmental problems due to excessive lead exposure in pregnant women.

SECTION 12 -- ECOLOGICAL INFORMATION

In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates, and phosphates, and precipitates out of the water column. Lead may occur as sorbed ions or surface coatings on sediment mineral particles or may be carried in colloidal particles in surface water. 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.

SECTION 13 -- DISPOSAL CONSIDERATIONS

Lead-acid batteries are completely recyclable. Return whole scrap batteries to distributor, manufacturer or lead smelter for recycling. For information on returning batteries to Trojan battery Company for recycling call 800-423-6569. For neutralized spills, place residue in acid-resistant containers with sorbent material, sand or earth and dispose of in accordance with local, state and federal regulations for acid and lead compounds. Contact local and/or state environmental officials regarding disposal information.

SECTION 14 -- TRANSPORT INFORMATION

U.S. DOT PROPER SHIPPING NAME: Batteries, wet, non-spillable

U.S. DOT HAZARD CLASS: 8

U.S. DOT ID NUMBER: UN2800

U.S. DOT PACKING GROUP: III

U.S. DOT LABEL: CORROSIVE

OR Excepted from the requirements because batteries have passed the Vibration and Pressure Differential performance tests for Nonspillable designation.

IMO PROPER SHIPPING NAME: Batteries, wet, non-spillable

IMO REGULATION PAGE NUMBER: 8120

IMO U.N. CLASS: 8

IMO U.N. NUMBER: UN 2800

IMO PACKING GROUP: III

IMO LABEL: None required

IMO VESSEL STOWAGE: A

IATA PROPER SHIPPING NAME: Batteries, wet, non-spillable

IATA U.N. CLASS: 8

IATA U.N. NUMBER: UN 2800

IATA PACKING GROUP: III

IATA LABEL: CORROSIVE

SECTION 15 -- REGULATORY INFORMATION

U.S. HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD:

LEAD – YES
ANTIMONY – YES
ARSENIC – YES
SULFURIC ACID – YES

INGREDIENTS LISTED ON TSCA INVENTORY:

YES

CERCLA SECTION 304 HAZARDOUS SUBSTANCES:

LEAD – YES
ANTIMONY – YES
ARSENIC – YES
SULFURIC ACID – YES

RQ: N/A*
RQ: 5000 POUNDS
RQ: 1 POUND
RQ: 1000 POUNDS

* RQ: REPORTING NOT REQUIRED WHEN DIAMETER OF THE PIECES OF SOLID METAL RELEASED IS EQUAL TO OR EXCEEDS 100 μ m (micrometers).

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE:

SULFURIC ACID – YES

EPCRA SECTION 313 TOXIC RELEASE INVENTORY:

LEAD – CAS NO: 7439-92-1
ANTIMONY – CAS NO: 7440-36-0
ARSENIC – CAS NO: 7440-38-2
SULFURIC ACID – CAS NO: 7664-93-9

SECTION 16 -- OTHER INFORMATION

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, TROJAN BATTERY COMPANY MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES. ALTHOUGH REASONABLE PRECAUTIONS HAVE BEEN TAKEN IN THE PREPARATION OF THE DATA CONTAINED HEREIN, IT IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THIS MATERIAL SAFETY DATA SHEET PROVIDES GUIDELINES FOR THE SAFE HANDLING AND USE OF THIS PRODUCT; IT DOES NOT AND CANNOT ADVISE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.

FORM MSDS REV. 1/1/02