

I. PRODUCT IDENTIFICATION

Chemical Trade Name (as used on label): Lead-Acid Battery, Wet	Chemical Family/Classification: Electric Storage Battery
Synonyms: Industrial Battery, Traction Battery, Stationary Battery, Deep Cycle Battery	Telephone: For information and emergencies, contact Hawker's Environmental, Health & Safety Dept. at 423-238-5700
Manufacturer's Name/Address: Hawker Powersource P.O. Box 808 9404 Ooltewah Industrial Drive Ooltewah, TN 37363	24-Hour Emergency Response Contact: CHEMTREC DOMESTIC: 800-424-9300 CHEMTREC INT'L: 703-527-3877

II. GHS HAZARDS IDENTIFICATION

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

GHS LABEL:

HEALTH	ENVIRONMENTAL	PHYSICAL
		

<p>Hazard Statements</p> <p>DANGER!</p> <p>Causes severe skin burns and serious eye damage.</p> <p>May damage fertility or the unborn child if ingested or inhaled.</p> <p>May cause cancer if ingested or inhaled.</p> <p>Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure.</p> <p>May form explosive air/gas mixture during charging.</p> <p>Extremely flammable gas (hydrogen).</p> <p>Explosive, fire, blast, or projection hazard.</p> <p>May cause harm to breast-fed children</p> <p>Harmful if swallowed, inhaled, or contact with skin</p> <p>Causes skin irritation, serious eye damage.</p>	<p>Precautionary Statements</p> <p>Wash thoroughly after handling.</p> <p>Do not eat, drink or smoke when using this product.</p> <p>Wear protective gloves/protective clothing, eye protection/face protection.</p> <p>Avoid breathing dust/fume/gas/mist/vapors/spray.</p> <p>Use only outdoors or in a well-ventilated area.</p> <p>Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid.</p> <p>Irritating to eyes, respiratory system, and skin.</p> <p>Obtain special instructions before use.</p> <p>Do not handle until all safety precautions have been read and understood</p> <p>Avoid contact during pregnancy/while nursing</p> <p>Keep away from heat./sparks/open flames/hot surfaces. No smoking</p>
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III. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Approximate % by Wt.
Inorganic Lead Compound:		
Lead	7439-92-1	60-70
* Antimony	7440-36-0	2
* Arsenic	7440-38-2	0.2
* Calcium	7440-70-2	0.04
* Tin	7440-31-5	0.2
Electrolyte (Sulfuric Acid (H2SO4/H2O))	7664-93-9	10-30
Case Material:		5-10
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	9002-88-4	



SAFETY DATA SHEET

Form #: SDS 853020H
Revised: AC 01/04/19
Supersedes: AB
ECO #: 1002070

Other: Silicon Dioxide (Gel batteries only) Sheet Molding Compound (Glass reinforced polyester)	7631-86-9 --	1-5	
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Inorganic lead and electrolyte (sulfuric acid) are the primary components of every battery manufactured by Hawker. Other ingredients may be present dependent upon battery type. Contact your Hawker representative for additional information.

IV. FIRST AID MEASURES

Inhalation:
Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen. Consult a physician
Lead: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion:
Sulfuric Acid: Give large quantities of water; do not induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death; consult a 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. If symptoms persist, seek medical attention. Wash contaminated clothing before reuse. Discard contaminated shoes
Lead: Wash immediately with soap and water.

Eyes:
Sulfuric Acid and Lead: Flush immediately with large amounts of water for a least 15 minutes while lifting lids
Seek immediate medical attention if eyes have been exposed directly to acid.

V. FIRE FIGHTING MEASURES

Flash Point: N/A **Flammable Limits:** LEL = 4.1% (Hydrogen Gas) UEL = 74.2%

Extinguishing Media: CO2; foam; dry chemical. Do not use carbon dioxide directly on cells. Avoid breathing vapors. Use appropriate media for surrounding fire.

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, gloves, face and eye protection. But note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

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.

VI. ACCIDENTAL RELEASE MEASURES

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 unneutralized acid to sewer. Acid must be managed in accordance with local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

VII. HANDLING AND STORAGE

Handling:
Unless involved in recycling operations, do not breach the casing or empty the contents of the battery. Handle carefully and avoid tipping, which may allow electrolyte leakage. There may be increasing risk of electric shock from strings of connected batteries. 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 automotive batteries to avoid damage and short circuits. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water. Use banding or stretch wrap to secure items for shipping.

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. Keep away from metallic objects could bridge the terminals on a battery and create a dangerous short-circuit.

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.

VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits (mg/m3) Note: N.E.= Not Established

INGREDIENTS (Chemical/Common Names)	OSHA PEL	ACGIH	US NIOSH	Quebec PEV	Ontario OEL	EU OEL
Lead and Lead Compounds (inorganic)	0.05	0.05	0.05	0.05	0.05	0.15 (b)
Antimony	0.5	0.5	0.5	0.5	0.5	0.5 (b,e)
Arsenic	0.01	0.01	0.002	0.2	0.01	N.E
Calcium	N.E	N.E	N.E	N.E	N.E	N.E
Tin	2	2	2	2	2	N.E
Electrolyte (Sulfuric Acid)	1	0.2	1	1	0.2	0.05 (c)
Polypropylene	N.E	N.E	N.E	N.E	N.E	N.E
Polystyrene	N.E	N.E	N.E	N.E	N.E	N.E
Styrene Acrylonitrile	N.E	N.E	N.E	N.E	N.E	N.E
Acrylonitrile Butadiene						
Styrene	N.E	N.E	N.E	N.E	N.E	N.E
Styrene Butadiene	N.E	N.E	N.E	N.E	N.E	N.E
Polyvinylchloride	N.E	N.E	N.E	N.E	1	N.E
Polycarbonate, Hard Rubber, Polyethylene	N.E	N.E	N.E	N.E	N.E	N.E
Silicon Dioxide (Gel Batteries Only)	N.E	N.E	N.E	N.E	N.E	N.E
Sheet Molding Compound (Glass reinforced polyester)	N.E	N.E	N.E	N.E	N.E	N.E

NOTES:

- (b) As inhalable aerosol
- (c) Thoracic fraction
- (e) Based on OEL;s Of Austria, Belgium, Denmark, France, Netherlands, Switzerland, & U.K.

Engineering Controls (Ventilation):

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant. Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing, eye and face protection when filling, charging or handling batteries. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Charge the batteries in areas with adequate ventilation. General dilution ventilation is acceptable.

Respiratory Protection (NIOSH/MSHA approved):

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection.

Skin Protection:

If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing and boots.

Eye Protection:

If battery case is damaged, use chemical goggles or face shield.

Other Protection:

In areas where sulfuric acid is handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply. Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots. Face shield recommended when adding water or electrolyte to batteries, wash hands after handling.

IX. PHYSICAL AND CHEMICAL PROPERTIES

Properties Listed Below are for Electrolyte:

Boiling Point:	203 - 240° F	Specific Gravity (H2O = 1):	1.215 to 1.350
Melting Point:	N/A	Vapor Pressure (mm Hg):	10
Solubility in Water:	100%	Vapor Density (AIR = 1):	Greater than 1
Evaporation Rate: (Butyl Acetate = 1)	Less than 1	% Volatile by Weight:	N/A
pH:	~1 to 2	Flash Point:	Below room temperature (as hydrogen gas)
LEL (Lower Explosive Limit)	4.1% (Hydrogen)	UEL (Upper Explosive Limit)	74.2% (Hydrogen)
Appearance and Odor:	Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.		

X. STABILITY AND REACTIVITYStability: Stable X Unstable **This product is stable under normal conditions at ambient temperature****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.

Arsenic compounds: strong oxidizers; bromine azide. NOTE: hydrogen gas can react with inorganic arsenic to form the highly toxic gas-arsine.

Hazardous Decomposition Products:

Sulfuric Acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen sulfide.

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.

Hazardous Polymerization:

Will not occur

XI. TOXICOLOGICAL INFORMATION**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. The presence of nascent hydrogen may generate highly toxic arsine gas.

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.

Arsenic Compounds: Contact may cause dermatitis and skin hyper pigmentation.

Eye Contact:

Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.

Lead Components: 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 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 50mcg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Carcinogenicity:

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Group 1 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 Group 2A carcinogen, likely in animals at extreme doses. Per the guidance found in OSHA 29 CFR 1910.1200 Appendix F, this is approximately equivalent to GHS Category 1B. Proof of carcinogenicity in humans is lacking at present.

Arsenic: Arsenic is listed by IARC as a Group 1 - carcinogenic to humans. Per the guidance found in OSHA 29 CFR 1910.1200 Appendix F, this is approximately equivalent to GHS Category 1A.

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

Acute Toxicity:

Inhalation LD50:

Electrolyte: LC50 rat: 375 mg/m³; LC50: guinea pig: 510 mg/m³Elemental Lead: Acute Toxicity Point Estimate = 4500 ppmV (based on lead bullion)Elemental Arsenic: No data**Oral LD50:**Electrolyte: rat: 2140 mg/kgElemental Lead: Acute Toxicity Estimate (ATE) = 500 mg/kg body weight (based on lead bullion)Elemental Arsenic: LD50 mouse: 145 mg/kgElemental Antimony: LD50 rat: 100 mg/kg**Additional Health Data:**

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 ingestion: wash hands, face, neck and arms thoroughly before eating, smoking or leaving the worksite. 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.

XII. ECOLOGICAL INFORMATION**Environmental Fate:**

Lead is very persistent in soil and sediments. No data on environmental degradation. Mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds and not elemental lead.

Environmental Toxicity: Aquatic Toxicity:

Sulfuric acid: 24-hr LC50, freshwater fish (Brachydanio rerio): 82 mg/L
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

Arsenic: 24 hr LC50, freshwater fish (Carrassius auratus) >5000 g/L.

Additional Information:

- No known effects on stratospheric ozone depletion.
- Volatile organic compounds: 0% (by Volume)
- Water Endangering Class (WGK): NA

XIII. DISPOSAL CONSIDERATIONS (UNITED STATES)

Spent batteries: Send to secondary lead smelter for recycling. Spent lead-acid batteries are not regulated as hazardous waste when the requirements of 40 CFR Section 266.80 are met. This should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.

Electrolyte:

Place neutralized slurry into sealed containers and handle as applicable with state and federal regulations. 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.

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

XIV. TRANSPORT INFORMATION**U.S. DOT:**

The transportation of wet and moist charged (moist active) batteries within the continental United States is regulated by the U.S. DOT through the Code of Federal Regulations, Title 49 (49CFR). These regulations classify these types of batteries as a hazardous material. Refer to CFR 49, 173.159 for more details pertaining to the transportation of wet and moist batteries.

The shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid

Packing Group: N/A

Hazardous Class: 8

Label/Placard Required: Corrosive

UN Identification: UN2794

Contact your Hawker representative for additional information regarding the classification of batteries.

49 CFR 173.159(e) specifies that 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 of the following are met:

- (1) No other hazardous materials may be transported in the same vehicle;
- (2) The batteries must be loaded or braced so as to prevent damage and short circuits in transit;
- (3) Any other material loaded in the same vehicle must be blocked, braced, or otherwise secured to prevent contact with or damage to the batteries; and
- (4) The transport vehicle may not carry material shipped by any person other than the shipper of the batteries.

If any of the above-referenced requirements are not met, the batteries must be shipped as fully-regulated Class 8 Corrosive hazardous materials.

TSCA:

TSCA Section 8b – Inventory Status: All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

TSCA Section 12b (40 CFR Part 707.60(b)) No notice of export will be required for articles, except PCB articles, unless the Agency so requires in the context of individual section 5, 6, or 7 actions.

TSCA Section 13 (40 CFR Part 707.20): No import certification required (EPA 305-B-99-001, June 1999, Introduction to the Chemical Import Requirements of the Toxic Substances Control Act, Section IV.A).

RCRA:

Spent Lead Acid Batteries are subject to streamlined handling requirements when managed in compliance with 40 CFR section 266.80 or 40 CFR part 273. Waste sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).

CAA:

Hawker 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, Hawker established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.

STATE REGULATIONS (US):**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. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.

INTERNATIONAL REGULATIONS:

Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

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

Article 33 (1) of the REACH regulation (Reg. EC 1907/2006), which entered into force on 1st of June 2007 in the European Union, requires that manufacturers communicate the presence of Substances of Very High Concern (SVHC) in articles (lead batteries) in concentration greater than 0.1% by weight.

Effective the 27th of June 2018, the European Chemical Agency (ECHA) updated the Candidate List with the inclusion of Lead Metal (CAS No.: 7439-92-1). This inclusion of Lead as an SVHC applies to all of EnerSys Lead based battery products regardless of the design (Flooded, Gel, AGM, etc...).

XVI. OTHER INFORMATION

Revised: AC 01/04/19

NFPA Hazard Rating for Sulfuric Acid:

Flammability (Red) = 0

Reactivity (Yellow) = 2

Health (Blue) = 3

Sulfuric acid is water-reactive if concentrated.

DISCLAIMER

This Safety Data Sheet is created by the manufacturer to comply with the requirements of 29 CFR 1910.1200. To the extent allowed by law, the manufacturer hereby expressly disclaims any liability to any third party, including users of this product, including, but not limited to, consequential or other damages, arising out of the use of, or reliance on, this Safety Data Sheet.