

MATERIAL DATA SAFETY SHEET

MSDS No. L 8
Date Issued Nov. 15, 1985
Date Revised June 11, 2002

Chemical/Trade Name (identity used on label) Lead Acid Battery		Chemical Family/Classification Electric Storage Battery	HMIS Rating for Sulfuric Acid 3 0 2 X
Synonyms/Common Name SLI Battery		DOT, IATA and IMO Description Battery, Wet, Filled with Acid, UN 2794, Class 8	
Company Name Johnson Controls, Inc.		Address P.O. Box 591 Milwaukee, WI 53201	
Division or Department Automotive Systems Group		TELEPHONE NUMBER	
CONTACT			
Questions Concerning MSDS Industrial Hygiene, Safety & Security - Automotive Systems, Battery		Day: SLI: (800) 333-2222 ext. 3138	
Transportation Emergencies CHEMTREC		24 Hours: (800) 424-9300	

II. Hazardous Ingredients

Material	% by Wt.	CAS Number	Eight Hour Exposure Limits		
			OSHA PEL	ACGIH TLV	Other
Specific Chemical Identity Lead	34	7439-92-1	50 µg/m ³	150 µg/m ³	NIOSH REL
Common Name Grid					100 µg/m ³
Specific Chemical Identity Lead Dioxide	31	1309-60-0	50 µg/m ³	150 µg/m ³	NIOSH REL
Common Name Lead Oxide					100 µg/m ³
Specific Chemical Identity Lead Sulfate	<1	7446-14-2	50 µg/m ³	150 µg/m ³	NIOSH REL
Common Name Anglesite					100 µg/m ³
Specific Chemical Identity Sulfuric Acid (35%)	34	7664-93-9	1mg/m ³	1 mg/m ³ STEL	NIOSH REL
Common Name Battery Electrolyte (Acid)				3 mg/m ³ (15 min. max./8 hr. shift)	1 mg/m ³

NOTE: The contents of this product are toxic chemicals that are subject to the reporting requirements of section 302 and 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40CFR 355 and 372).

III. Physical Data

Material is (at normal temperatures) <input checked="" type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid		Appearance and Odor Battery Electrolyte (acid) is a clear to cloudy liquid with slight acidic odor. Acid saturated lead oxide is a dark reddish-brown to gray solid with slight acidic odor.
Boiling Point (at 760 mm Hg) Lead 1755°C Batt. Electrolyte (Acid) 110-112°C	Melting Point Lead 327.4°C	
Specific Gravity (H ₂ O =1) Battery Electrolyte (Acid) 1.210 - 1.300	Vapor Pressure <input checked="" type="checkbox"/> (mm Hg at 20°C) •(PSIG) Battery Electrolyte (Acid) 11.7	
Vapor Density (Air =1) Battery Electrolyte (Acid) 3.4	Solubility is H ₂ O Lead and Lead Dioxide are not soluble. Battery Electrolyte (acid) is 100% soluble in water.	
% Volatile By Weight Not Determined	Evaporation rate (Butyl Acetate = 1) Not Determined	

IV. Health Hazard Information

NOTE: Under normal conditions of battery use, internal components will not present a health hazard. The following information is provided for battery electrolyte (acid) and lead for exposure that may occur during battery production or container breakage or under extreme heat conditions such as fire

ROUTES AND METHODS OF ENTRY

Inhalation

Acid mist generated during battery formation may cause respiratory irritation. Spillage of acid from batteries in confined areas may also lead to exposure to sulfuric acid mist.

Skin Contact

Battery electrolyte (acid) may cause irritative contact dermatitis.

Skin Absorption

Skin absorption is not a significant route of entry.

Eye Contact

Battery electrolyte (acid) will irritate the eyes upon contact.

Ingestion

Hands contaminated by contact with internal components of a battery can cause ingestion of lead/lead compounds. Hands should be washed prior to eating, drinking, or smoking.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Acute Effects

Acute effects of overexposure to lead compounds are GI (gastrointestinal) upset, loss of appetite, diarrhea, constipation with cramping, difficulty in sleeping, and fatigue. Exposure and/or contact with battery electrolyte (acid) may lead to acute irritation of the skin, corneal damage of the eyes, and irritation of the mucous membranes of the eyes and upper respiratory system, including lungs.

Chronic Effects

Lead and its compounds may cause chronic anemia, damage to the kidneys and nervous system. Lead may also cause reproductive system damage and can affect developing fetuses in pregnant women. Battery electrolyte (acid) may lead to scarring of the cornea, chronic bronchitis, as well as erosion of tooth enamel in mouth breathers in repeated exposures.

POTENTIAL TO CAUSE CANCER

The National Toxicological Program (NTP) and The International Agency for Research on Cancer (IARC) have classified "strong inorganic acid mist containing sulfuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. The ACGIH has classified "strong inorganic acid mist containing sulfuric acid" as an A2 carcinogen (suspected human carcinogen). These classifications do 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.

The NTP and the IARC have classified lead as an A3 carcinogen (animal carcinogen). While the agent is carcinogenic in experimental animals at relatively high doses, the agent is unlikely to cause cancer in humans except under uncommonly high levels of exposure. For further information, see the ACGIH's pamphlet, *1996 Threshold Limit Values and Biological Exposure Indices*.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation

Remove from exposure and consult a physician if any of the acute effects listed above develop.

Skin

Wash thoroughly with soap and water. If acid is splashed on clothing, remove and discard. If acid is splashed in shoes, remove them immediately and discard. Acid cannot be removed from leather.

Eyes

Immediately rinse with cool running water for at least 15 minutes. Seek medical attention after rinsing.

Ingestion

Lead/Lead compounds: Consult a physician.

Battery Electrolyte (Acid): Do not induce vomiting. Refer to a physician immediately.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inorganic lead and its compounds can aggravate chronic forms of kidney, liver, and neurologic diseases. Contact of battery electrolyte (acid) with the skin may aggravate skin diseases such as eczema and contact dermatitis.

V. Fire and Explosion Data

Flash Point (test method) Hydrogen - 259°C	Autoignition Temperature Hydrogen 580°C	Flammable Limits in Air, % by Vol. Hydrogen LEL - 4.1 UEL - 74.2
Extinguishing Media Dry chemical, foam, or CO₂		
Special Fire Fighting Procedures Use positive pressure, self-contained breathing apparatus.		
Unusual Fire and Explosion Hazard Hydrogen and oxygen gases are produced in the cells during normal battery operations, hydrogen is flammable and oxygen supports combustion. These gases enter the air through the vent caps. To avoid the chance of a fire or explosion, keep sparks and other sources of ignition away from the battery.		

VI. Reactivity Data

Stability <input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Stable	Conditions to Avoid Sparks and other sources of ignition may ignite hydrogen gas.
Incompatibility (materials to avoid) Lead/lead compounds: Potassium, carbides, sulfides, peroxides, phosphorus, sulfur. Battery electrolyte (acid): Combustible materials, strong reducing agents, most metals, carbides, organic materials, chlorates, nitrates, picrates, and fulminates.	
Hazardous Decomposition Products Lead/Lead compounds: Oxides of lead and sulfur Battery electrolyte (acid): Hydrogen, sulfur dioxide, sulfur trioxide	
Hazardous Polymerization <input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur	Conditions to Avoid High temperature. Battery electrolyte (acid) will react with water to produce heat. Can react with oxidizing or reducing agents.

VII. Control Measures

Engineering Controls Store lead acid batteries with adequate ventilation. Room ventilation is required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.
Work Practices Make certain vent caps are on tightly. Place a minimum of two layers of corrugated cardboard between layers of batteries. When stacking in trailer, stack no more than three layers high. Use a battery carrier to lift a battery or place hands at opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of the batteries.
PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection None required under normal handling conditions. During battery formation (high-rate charge condition), acid mist can be generated, which may cause respiratory irritation. If irritation occurs, wear a respirator suitable for protection against acid mist.
Eyes and Face Chemical splash goggles are preferred. Also acceptable are "Visor-Gogs" or a chemical face shield worn over safety glasses with solid side shields.
Hands, Arms, and Body Vinyl-coated, PVC, gauntlet-type gloves with rough finish.
Other Special Clothing and Equipment Safety shoes worn with rubber or neoprene boots or steel-toed rubber or neoprene boots worn over socks. Place pants legs over boots to keep acid out of boots. All footwear must meet requirements of ANSI Z41.1 - Rev. 1972.

VIII. Safe Handling Precautions

Hygiene Practices

Wash hands thoroughly before eating, drinking, or smoking after handling batteries.

Protective Measures to be Taken During Non-Routine Tasks, Including Equipment Maintenance

Wear recommended eye protection. If clothing becomes saturated with acid, remove and wash affected area with water for 15 minutes. Discard saturated clothing.

SPILL OR LEAK PROCEDURES

Protective Measures to be Taken if Material is Released or Spilled

Remove combustible materials and all sources of ignition. Contain spill by diking with soda ash (sodium carbonate) or quicklime (calcium oxide). Cover spill with either chemical. Mix well. Make certain the mixture is neutral, then collect residue and place in a drum or other suitable container. Dispose of as a hazardous waste.

Wear acid-resistant boots, chemical face shield, chemical splash goggles, and acid-resistant gloves.

DO NOT RELEASE UNNEUTRALIZED ACID!

Waste Disposal Method

Battery Electrolyte (Acid): Neutralize as above for a spill, collect residue, and place in a drum or suitable container. Dispose of as a hazardous waste.

DO NOT FLUSH LEAD-CONTAMINATED ACID INTO SEWER.

Batteries: Send to lead smelter for reclamation following applicable Federal, state, and local regulations.



OTHER HANDLING AND STORAGE PRECAUTIONS

An eyewash fountain and safety shower should be located in or near the production or storage area(s) for lead/lead acid batteries. Such storage areas should be equipped with a containment facility which captures acid spills so that they may be neutralized, collected, and disposed of properly.

Material Safety Data Sheet

[\[Home\]](#) [\[Manufacturer\]](#) [\[Part Number\]](#) [\[NSN\]](#) [\[Help\]](#)

SECTION I - Material Identity

Item Name..... BATTERY ELECTROLYTE (ACID)
Part Number/Trade Name..... BATTERY ELECTROLYTE (ACID)
National Stock Number..... 6140PBATTERACID
CAGE Code..... 25244
Part Number Indicator..... A
MSDS Number..... 187646
HAZ Code..... B

SECTION II - Manufacturer's Information

Manufacturer Name..... JOHNSON CONTROLS, INC - BATTERY
P.O. Box..... 591
City..... MILWAUKEE
State..... WI
Country..... US
Zip Code..... 53201
Emergency Phone..... 800-424-9300 CHEMTREC
Information Phone..... 800-365-7777

MSDS Preparer's Information

Date MSDS Prepared/Revised..... 10JUL97
Active Indicator..... N

Alternate Vendors

SECTION III - Physical/Chemical Characteristics

Appearance/Odor..... CLEAR TO CLOUDY LIQUID WITH SLIGHT ACIDIC ODOR
Boiling Point..... 230F 110C
Melting Point..... NR
Vapor Pressure..... 11.7
Vapor Density..... 3.4
Specific Gravity..... 1.265
Evaporation Rate..... NOT DETERMINED
Solubility in Water..... 100 %
Container Type..... R
Container Pressure Code..... 1
Temperature Code..... 4
Product State Code..... L

SECTION IV - Fire and Explosion Hazard Data

Flash Point Method..... NA
 Lower Explosion Limit..... NONE
 Upper Explosion Limit..... NONE
 Extinguishing Media..... USE DRY CHEMICAL, FOAM, OR CARBON DIOXIDE (CO2)
 Special Fire Fighting Procedures..... AVOID USE OF WATER WHERE THERE IS DANGER OF ACID SPREADING. USE PRESSURE DEMAND, SELF-CONTAINED BREATHING APPARATUS WHERE ACID VAPOR OR MIST MAY BE PRESENT.
 Unusual Fire/Explosion Hazards..... CHARGING AND FORMING BATTERIES MAY GENERATE HYDROGEN GAS WHICH IS FLAMMABLE AND EXPLOSIVE. THEY ALSO GENERATE OXYGEN WHICH SUPPORTS COMBUSTION. THEREFORE, KEEP SPARKS AND OTHER SOURCES OF IGNITION AWAY. HYDROGEN MAY ALSO BE GENERATED BY THE ACTION OF ACID ON ORGANIC MATERIALS, NITRATES, CARBIDES AND MOST METALS

SECTION V - Reactivity Data

Stability..... YES
 Stability Conditions to Avoid..... PREVENT SMOKING, FIRES, AND ANY OTHER SOURCE OF IGNITION AROUND LEAD ACID BATTERIES.
 Materials to Avoid..... COMBUSTIBLE MATERIALS (ESPECIALLY FINELY DIVIDED), STRONG REDUCING AGENTS, MOST METALS, CARBIDES, ORGANIC MATERIALS, CHLORATES, NITRATE PICRATES, AND FULMINATES.
 Hazardous Decomposition Products..... HYDROGEN, SULFUR DIOXIDE, SULFUR TRIOXIDE.
 Hazardous Polymerization..... NO
 Polymerization Conditions to Avoid..... WILL NOT OCCUR. AVOID HIGH TEMPERATURE. BATTERY ELECTROLYTE (ACID) WILL REACT WITH WATER TO PRODUCE HEAT.

SECTION VI - Health Hazard Data

Route of Entry: Skin..... YES
 Route of Entry: Ingestion..... YES
 Route of Entry: Inhalation..... YES
 Health Hazards - Acute and Chronic..... [ACUTE] MIST CAUSES SEVERE IRRITATION OF EYES, RESPIRATORY TRACT AND SKIN. IT MAY ALSO CAUSE TOOTH EROSION, MOUTH SORENESS, OR BREATHING DIFFICULTIES. CONTACT WITH MAY IRRITATE SKIN AND MUCOUS MEMBRANES AND MAY CAUSE IRREPARABLE CORNEAL DAMAGE AND BLINDNESS AS WELL AS FACIAL SCARRING WHICH CAN INCLUDE THE EYELIDS. [CHRONIC] SKIN IRRITATION. MAY ERODE TEETH, CAUSE DERMATITIS, CHRONIC IRRITATION OF THE EYES, MOUTH, AND STOMACH AND CHRONIC INFLAMMATION OF THE NOSE, THROAT AND BRONCHIAL TUBES.
 Carcinogenicity: NTP..... NR
 Carcinogenicity: IARC..... YES
 Carcinogenicity: OSHA..... NR
 Explanation of Carcinogenicity..... SULFURIC ACID CONSIDERED POTENTIAL CARCINOGEN

Symptoms of Overexposure..... SAME AS ABOVE

Medical Cond. Aggravated by Exposure.... CONTACT OF BATTERY ACID WITH THE SKIN AND EYES MAY AGGRAVATE CHRONIC SKIN AND EYE DISEASES. INHALATION OF MIST MAY AGGRAVATE CHRONIC DISEASES OF THE RESPIRATORY TRACT AND STOMACH.

Emergency/First Aid Procedures..... [INHAL] REMOVE FROM EXPOSURE AND CONSULT A PHYSICIAN IF ANY OF THE ACUTE EFFECTS LISTED ABOVE DEVELOP.
[SKIN] WASH THOROUGHLY WITH SOAP AND WATER. IF SPLASHED ON CLOTHING REMOVE AND DISCARD. ACID CANNOT BE REMOVED FROM LEATHER. [EYE] HOLD EYELIDS OPEN AND IMMEDIATELY RINSE WITH COOL, RUNNING WATER FOR AT LEAST 15 MIN. SEEK MEDICAL ATTENTION AFTER RINSING.
[INGEST] DO NOT INDUCE VOMITING. SEE PHYSICIAN IMMEDIATELY. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SECTION VII - Precautions for Safe Handling and Use

Steps if Material Released/Spilled..... VENTILATE AREA. REMOVE COMBUSTIBLE MATERIALS AND ALL SOURCES OF IGNITION. CONTAIN SPILL BY DIKING WITH SODA ASH (SODIUM CARBONATE) OR LIME (CALCIUM OXIDE). COVER SPILL WITH EITHER CHEMICAL. MIX WELL. MAKE CERTAIN MIXTURE IS NEUTRAL (CHECK WITH PH PAPER). COLLECT RESIDUE AND PLACE IN A DRUM OR OTHER SUITABLE CONTAINER. DISPOSE OF AS HAZARDOUS WASTE.

Neutralizing Agent..... SODA ASH (SODIUM CARBONATE) OR LIME (CALCIUM OXIDE)

Waste Disposal Method..... NEUTRALIZE AS ABOVE FOR A SPILL, COLLECT RESIDUE, AND PLACE IN A DRUM OR SUITABLE CONTAINER. DISPOSE OF AS HAZARDOUS WASTE. DO NOT FLUSH LEAD CONTAMINATED ACID TO A SEWER.

Handling and Storage Precautions..... STORE IN COOL, DRY PLACE, AND PROTECT THEM FROM DAMAGE. DO NOT STACK ACID CONTAINER MORE THAN FOUR HIGH. TO DILUTE CONCENTRATED ACID, ADD ACID TO WATER (NOT WATER TO ACID). WATER CAN BE ADDED TO DILUTE BATTERY ACID IN SMALL QUANTITIES WITHOUT DANGER OF VIOLENT REACTION.

Other Precautions..... AN EYEWASH FOUNTAIN AND SAFETY SHOWER SHOULD BE LOCATED IN OR NEAR THE STORAGE AREAS USED FOR LEAD ACID BATTERIES AND OR ACID CONTAINERS. SUCH STORAGE AREAS SHOULD BE EQUIPPED WITH A DRAIN WHICH CAPTURES SPILLS OF ACID SO THAT THEY MAY BE NEUTRALIZED, COLLECTED, AND DISPOSED OF PROPERLY.

SECTION VIII - Control Measures

Respiratory Protection..... NONE REQUIRED UNDER NORMAL HANDLING CONDITIONS. IF ACID SPILLAGE OCCURS IN A CONFINED SPACE, A RESPIRATOR SUITABLE FOR PROTECTION AGAINST ACID MIST MAY BE REQUIRED.

Ventilation..... GENERAL DILUTION VENTILATION TO MAINTAIN CONCENTRATIONS OF SULFURIC ACID MIST BELOW OSHA PEL OF 1 MG/M3.

Protective Gloves..... GAUNTLET TYPE GLOVES.

Eye Protection..... CHEMICAL SPLASH GOGGLES , CHEMICAL FACE SHIELD.

Other Protective Equipment..... WEAR LONG SLEEVED SHIRT / TROUSERS MADE OF SYNTHETIC

Hygienic Practices..... WASH THOROUGHLY AFTER HANDLING
 Supplemental Health/Safety Data..... AN EYEWASH FOUNTAIN AND SAFETY SHOWER SHOULD BE
 LOCATED IN OR NEAR THE STORAGE AREAS USED FOR LEAD
 ACID BATTERIES AND OR ACID CONTAINERS. SUCH STORAGE
 AREAS SHOULD BE EQUIPPED WITH A DRAIN WHICH CAPTURES
 SPILLS OF ACID SO THAT THEY MAY BE NEUTRALIZED,
 COLLECTED, AND DISPOSED OF PROPERLY.

SECTION IX - Label Data

Protect Eye..... YES
 Protect Skin..... YES
 Protect Respiratory..... YES
 Chronic Indicator..... YES
 Contact Code..... MODERATE
 Fire Code..... UNKNOWN
 Health Code..... UNKNOWN
 React Code..... UNKNOWN
 Specific Hazard and Precaution..... TARGET ORGANS: SKIN, TEETH, EYES, MUSOUS MEMBRANES,
 RESPIRATORY SYSTEM

SECTION X - Transportation Data

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)..... 0
 Volatile Organic Compounds (G/L)..... 0

SECTION XII - Ingredients/Identity Information

Ingredient #..... 01
 Ingredient Name..... SULFURIC ACID (DILUTE)
 CAS Number..... 7664939
 Proprietary..... NO
 Percent..... 35
 OSHA PEL..... 1 MG/M3
 ACGIH TLV..... 1 MG/M3

NOTICE: For additional information, contact BIOENVIRONMENTAL/7-4551

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