

MATERIAL SAFETY DATA SHEET – Battery Acid (U.S.)

MSDS No. B20
Date Issued Dec. 1, 1984
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I. Product Identification

Chemical/Trade Name (Identity used on label) Battery Acid	Chemical Family Classification Mineral Acid, Oxidizing	HMIS Rating 3 0 2 X
Synonyms/Common Name Battery Electrolyte (Acid)	DOT, IATA and IMO Description Battery Electrolyte (Acid), UN2796, Class 8	
Company Name Johnson Controls, Inc.	Address P.O. Box 591	
Division or Department Automotive Systems Group	Milwaukee, WI 53201	
CONTACT		TELEPHONE NUMBER
Questions Concerning MSDS Industrial Hygiene, Safety & Security - Automotive Systems, Battery	Day: (800) 333-2222 ext. 3138	
Transportation Emergencies CHEMTREC	24 Hours: (800) 424-9300	

II. Hazardous Ingredients

Material	% by Wt.	CAS Number	Exposure Limits		
			OSHA PEL	ACGIH TLV	Other
Specific Chemical Identity Sulfuric Acid (Dilute)	~ 35	7664-93-9	1 mg/m ³	1 mg/m ³	NIOSH REL 1 mg/m ³
Common Name Battery Electrolyte (Acid)				STEL 3 mg/m ³ (15 min. max./8 hr. shift)	

NOTE: This product is a toxic chemical that is subject to the reporting requirements of Section 302 and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 355 and 372).

III. Physical Data

Material is (at normal temperatures) <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas <input type="checkbox"/> Other	Appearance and Odor Clear to cloudy liquid with slight acidic odor.
Boiling Point (at 760 mm Hg) 230°F/110°C	Melting Point - 79.6°F/ - 62°C
Specific Gravity (H ₂ O = 1) 1.265	Vapor Pressure <input checked="" type="checkbox"/> (mm Hg at 20°C) <input type="checkbox"/> (PSIG) 11.7
Vapor Density (AIR = 1) 3.4	Solubility in H ₂ O 100%
% Volatiles By Weight 0	Evaporation Rate (Butyl Acetate = 1) Not Determined

IV. Health Hazard Information

ROUTES AND METHODS OF ENTRY

Inhalation

Battery electrolyte acid mist generated during battery formation may cause respiratory irritation.

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

Ingestion is not expected to be a significant route of entry.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Acute Effects

Exposure to high concentrations of battery electrolyte (acid) mist causes severe irritation of eyes, respiratory tract and skin. It may also cause tooth erosion, mouth soreness, or breathing difficulties. Contact with battery electrolyte (acid) may irritate the skin and mucous membranes and may cause irreparable corneal damage and blindness as well as facial scarring which can include the eyelids.

Chronic Effects

Repeated or prolonged exposure to battery electrolyte (acid) may cause skin irritation. Repeated or prolonged exposure to mist may erode the teeth, cause dermatitis, chronic irritation of eyes, mouth and stomach, and chronic inflammation of the nose, throat and bronchial tubes.

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.

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, immediately remove them and discard. If acid is splashed in shoes, remove them immediately and discard. Acid cannot be removed from leather.

Eyes

Hold eyelids open and immediately rinse with cool, running water for at least 15 minutes. Seek medical attention after rinsing.

Ingestion

Do not induce vomiting. See a physician immediately. Do not give anything by mouth to an unconscious person.

MEDICAL CONDITIONS WHICH CAN BE AGGRAVATED BY EXPOSURE

Contact of battery electrolyte (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.

V. Fire and Explosion Data

Flash Point (test method)	Autoignition Temperature	Flammable Limits in Air, % by Vol.	
None	None	Lower None	Upper 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 and Explosion Hazard 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.			

VI. Reactivity Data

Stability <input type="checkbox"/> Unstable <input type="checkbox"/> Stable	Conditions to avoid Prevent smoking, fires, and any other source of ignition around lead acid batteries.
Incompatibility (material 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 <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 Use general dilution ventilation to maintain concentrations of sulfuric acid mist below the OSHA PEL of 1 mg/m³ when forming or charging batteries.
Work Practices Handle lead acid batteries and containers of acid carefully to avoid spilling the acid.
PERSONAL PROTECTIVE EQUIPMENT
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.
Eyes and Face Chemical splash goggles in combination with a chemical faceshield offer the best protection. Also acceptable are "visor-gogs" or a chemical faceshield worn over safety glasses with solid side shields.
Hands, Arms, Body Wear a long sleeved shirt and trousers made of synthetic materials. Also use an impermeable, acid resistant apron and gauntlet type gloves.
Other Special Clothing and Equipment Use safety shoes 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

Remove splashes of acid immediately from the skin with large amounts of cool, running water followed by washing with soap and water.

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

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.

Wear acid resistant boots, faceshield, chemical splash goggles, and acid resistant gloves.

DO NOT RELEASE UNNEUTRALIZED ACID!

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.

OTHER HANDLING AND STORAGE PRECAUTIONS

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.

Do not stack acid containers more than four (4) high.

Store containers in a cool, dry place, and protect them from damage.

An eyewash fountain and safety shower should be located in or near the storage area(s) 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.