



MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION -- Lead Acid Battery October 2016

Chemical/Trade Name	Lead Acid Battery
Chemical family/ Classification	Electric Storage Battery
Company Name	CDN Energy and Power International Corp.
Address	#107, 10550 42 nd Street SE Calgary, AB, Canada, T2C 5C7 403-236-0333

Telephone

In the event of an emergency involving dangerous goods, call CANUTEC's 24-hour emergency phone line at 1-888-CAN-UTEC (226-8832), 613-996-6666 or *666 on a cellular phone.

2. HAZARDOUS INGREDIENTS

Material	% by Weight	Exposure Limits		
		CAS Number	OSHA	ACGIH
Lead	27 - 34%	7439-92-1	50µg /m ³	150µg /m ³
Lead oxide	39 - 48%	1309-60-0	50µg /m ³	150µg /m ³
Electrolyte (sulfuric acid and water)	11 - 23%	7664-93-9	1.0 mg/m ³	1.0 mg/m ³
Case material:				
Polypropylene	6 - 10%	9003-07-0	N/A	N/A
Hard rubber	6 - 10%	9003-55-8	N/A	N/A
Plate separator material:				
Polyethylene	1 - 2%	9002-86-2	N/A	N/A

3. PHYSICAL DATA

Materials (at normal temperature)	Electrolyte (sulfuric acid and water)
Boiling point (at 760 MM Hg)	229 – 248 °F
Melting point	Not applicable
Specific gravity (H ₂ O = 1)	1.230 - 1.350
Vapor density (AIR = 1)	Greater than 1
% Volatiles by weight	Not applicable
Appearance and odor	Electrolyte (sulfuric acid and water) is a clear liquid with a sharp, penetrating, pungent odor.
Vapor pressure (mm Hg @ 20...C)	10
Solubility in water (% by Wt.)	100%
Evaporation rate (Butyl acetate = 1)	Less than 1



4. HEALTH HAZARD INFORMATION

ROUTES AND METHOD OF ENTRY

Routes of entry Under normal conditions of use, sulfuric acid vapors and mist are not generated. Sulfuric acid vapors and mist may be generated when product is overheated, oxidized, or otherwise processed or damaged.

Under normal conditions of use, lead dust, vapors, and fumes are not generated. Hazardous exposure to lead may occur when product is overheated, oxidized, or otherwise processed or damaged to create lead dust, vapor, or fumes.

Inhalation High levels of sulfuric acid vapors or mist may cause severe respiratory irritation.

Skin contact Sulfuric acid may cause severe irritation, burns, and ulceration.

Skin absorption Sulfuric acid is not readily absorbed through the skin. Lead compounds are not readily absorbed through the skin.

Eye contact Sulfuric acid vapors or mist can cause severe irritation, burns, cornea damage, and possible blindness. Lead compounds may cause irritation.

Ingestion Sulfuric acid may cause severe irritation of mouth, throat, esophagus, and stomach. Lead compounds may cause abdominal pain, nausea, headaches, vomiting, diarrhea, and severe cramping. Acute ingestion should be treated by physician.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Acute effects Sulfuric acid may cause severe skin irritation, upper respiratory irritation, burns, damage to cornea, and possible blindness. Lead compounds may cause abdominal pain, nausea, headaches, vomiting, diarrhea, severe cramping, and difficulty in sleeping.

Chronic effects Sulfuric acid may lead to scarring of the cornea, inflammation of nose, throat and bronchial tubes, and possible erosion of tooth enamel. Lead compounds may cause anemia, and damage to the kidneys and nervous system. May cause reproductive harm in both males and females.

POTENTIAL TO CAUSE CANCER

Human studies are inconclusive regarding lead exposure and an increased cancer risk. The EPA and the International Agency for Research on Cancer (IARC) have categorized lead and inorganic lead compounds as a B2 classification (probable/possible human carcinogen) based on sufficient animal evidence and inadequate human evidence.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation Sulfuric acid: Remove to fresh air immediately. If breathing is difficult give oxygen. Lead compounds: Remove from exposure, gargle, wash nose and eyes, and consult physician.

Skin Sulfuric acid: Flush with large amounts of water for at least 15 minutes, remove any contaminated clothing and do not wear again until cleaned. If acid is splashed on shoes, remove and clean. Lead compounds are not readily absorbed through the skin.



Eyes	Sulfuric acid: Flush immediately with cool water for at least 15 minutes, then consult physician. Lead compounds: Flush immediately with cool water for at least 15 minutes, then consult physician.
Ingestion	Sulfuric acid: Give large quantities of water. DO NOT induce vomiting, then consult physician. Lead compounds: Consult a physician.

5. FIRE AND EXPLOSION DATA

Flash point	Not applicable
Flammable limits	Lower: 4.65% (Hydrogen gas) Upper: 93.9%
Extinguishing media	Carbon dioxide (Co2), foam, or dry chemical.
Special fire fighting Procedures	If batteries on charge, turn off power. Use positive pressure, self-contained breathing apparatus. Water applied to electrolyte generates heat and causes it to splatter. Wear acid resistant clothing.
Unusual fire and explosion hazard	Hydrogen and oxygen gases are produced in the cells during normal battery operation or when on charge (hydrogen is highly flammable and oxygen supports combustion). These gases enter the air through the vent caps. To avoid risk of fire or explosion, keep sparks and other sources of ignition away from the battery, and ensure that adequate ventilation is provided. Do not allow metallic material to simultaneously contact both the positive and negative terminals of batteries. Follow manufacturer's instructions for installation and operation.

6. REACTIVITY DATA

Stability	☐ Unstable ☒ <u>Stable</u>
Conditions to avoid	Sparks and other sources of ignition. Prolonged overcharge and overheating.
Incompatibility (material to avoid)	Combination of sulfuric acid with combustibles, and organic materials may cause fire and explosion. Also avoid strong reducing agents, most metals, carbides, chlorates, nitrates, picrate. Lead compound: potassium, carbides, sulfides, peroxides, phosphorus, and sulfur.
Hazardous decomposition products	Sulfuric acid: hydrogen, sulfur trioxide, hydrogen sulfide, and sulfuric acid mist.
Hazardous polymerization	☐ May occur ☒ <u>Will not occur</u>

7. CONTROL MEASURES

Engineering Controls	Store and handle lead acid batteries in well-ventilated areas.
Work Practices	Make certain vent caps are on tightly. Follow all manufacturer's recommendations when stacking or palletizing. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Use a battery carrier to lift battery or place hands on opposite corners to avoid spilling acid through the vents. Avoid contact with internal components of the batteries.



PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection	None are required under normal conditions. If concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA approved respiratory protection.
Eyes and face	Chemical splash goggles or face shield.
Hands, arms, body	Rubber or plastic acid resistant gloves with elbow length gauntlet.
Other special clothing and equipment	Acid resistant apron. Under severe exposure or emergency conditions, wear acid resistant clothing and boots.

8. 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	Charged batteries can present an electrical hazard. Take all appropriate precautions.

SPILL OR LEAK PROCEDURES

Protective measures to be taken if material is released or spilled	Remove combustible materials and all sources of ignition. Stop flow of material and contain spill by sprinkling with soda ash (sodium carbonate) or quick lime (calcium oxide). Carefully neutralize spill with soda ash, etc. Make certain mixture is neutral then collect residue and place in a drum or other suitable container with a label specifying "6; mF contains hazardous waste" or if uncertain call distributor regarding proper labeling procedures. Dispose of as hazardous waste. If battery is leaking, place battery in a heavy-duty plastic bag. Wear acid resistant boots, face shield, chemical splash goggles and acid resistant gloves. DO NOT RELEASE UNNEUTRALIZED ACID.
Waste disposal method	Sulfuric acid: Neutralize as described above for a spill, collect residue and place in a container labeled as containing hazardous waste. Dispose of as a hazardous waste. If uncertain about labeling procedures call your local battery distributor or the contacts listed on page 1 of this MSDS. DO NOT FLUSH LEAD CONTAMINATED ACID TO SEWER. Batteries: Send to lead recycling facility following applicable federal, state, and local regulations. Contact Battery Dealer for further information on the proper routine disposition of spent batteries.

9. OTHER

Regulatory Information

NFPA Hazard rating for Sulfuric Acid:
Flammability (Red) = 0 Health (Blue) = 3 Reactivity (Yellow) = 2

USDOT Shipping Description (for additional information see 49 CFR 173.159) :

Batteries, wet, filled with acid, Class 8, UN 2794, PG III *or, for dry batteries shipped with separate acid packs:*

Battery fluid, acid, Class 8, UN 2796, PG II



PROPOSITION 65 WARNING

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Wash hands after handling.

The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category 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 however result in the generation of sulfuric acid mist.

This product contains sulfuric acid (CAS #7664-93-9), an extremely hazardous substance (40 CFR 355.30), that may be subject to the reporting requirements of Sections 302/304, 311/312 and Section 313 (only acid aerosols including mists, vapors, gas, fog, and other airborne forms) of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and 40 CFR Parts 355, 370 and 372 (Community Right-to-Know).

This product contains lead (CAS #7439-92-1) and lead compounds, chemicals that may be subject to the reporting requirements of Sections 311/312 and Section 313 of SARA, and 40 CFR Parts 370 and 372 (Community Right-to-Know).
