



# MATERIAL SAFETY DATA SHEET

*This Material Safety Data Sheet complies with the Canadian Controlled Product Regulations.*

## 1. Product and Supplier Identification

**Product:** **GFX (Sealed Lead Acid) Batteries**

**Product Use:** DC Power Source, Electric Storage

**Supplier:** **GFX Power Inc.,**  
 #120 – 3823 Henning Drive,  
 Burnaby BC Canada V5C 6P3  
 General Enquiries: (604) 299-0199, Facsimile: (604) 299-0197

**Manufacturer:** As above

## 2. Composition

Component	% (w/w)	Exposure Limits	LD <sub>50</sub>	LC <sub>50</sub>
Lead, Lead sulphate, Lead oxide (as lead) (CAS No.7439-92-1)	65-75	0.05 mg/m <sup>3</sup> - Carcinogenicity Designation A3 Basis: CNS - central nervous system Blood Kidney Reproductive	Not available	Not available
Sulphuric acid (CAS No.7664-93-9)	17-30	0.2 mg/m <sup>3</sup> (Thoracic fraction) - Carcinogenicity Designation A2	2140 mg/kg (oral/rat)	510 mg/m <sup>3</sup> (inhalation/rat, 2 hour)

## 3. Hazards Identification

**Routes of Entry:**

In new condition manufactured article (under normal conditions of use)

Skin Contact: Minor    Eye Contact: Minor    Ingestion: Minor    Inhalation: Minor

Damaged or leaking battery

Skin Contact: Major    Eye Contact: Major    Ingestion: Moderate    Inhalation: Moderate

**Effects of Short-Term (Acute) Exposure:**

**Inhalation:** This battery is sealed and does not release gases or mists during use or recharging, therefore, inhalation is not a route of exposure for this product. In the case of a leaking battery, inhalation of sulphuric acid fumes or mists may cause severe mucous membrane and respiratory tract irritation. Severe overexposure may cause pulmonary edema.

**Skin Contact:** This battery is sealed and will not leak electrolyte under normal conditions of use, hence skin contact with electrolyte is unlikely. In the case of a leaking or damaged battery, acid contact will cause severe irritation and burns.

**Eye Contact:** This battery is sealed and will not leak electrolyte under normal conditions of use, hence eye contact with electrolyte is unlikely. In the case of a leaking or damaged battery, acid contact will cause severe irritation, burns, corneal damage and possible blindness.

**Ingestion:** This battery is sealed and will not leak electrolyte under normal conditions of use, therefore, ingestion of the electrolyte is very unlikely. Swallowing of the acid electrolyte will cause severe irritation and burns of the mouth and gastrointestinal tract.

**Effects of Long-Term (Chronic) Exposure:**

Long term exposure to battery electrolyte may cause lead poisoning with such symptoms as fatigue, insomnia, constipation, abdominal pain, central nervous system depression, anemia. May also accumulate in target organs such as the kidneys and liver.

Lead exposure is known to cause birth defects and reproductive problems. Chronic exposure to sulphuric acid mist may cause lung damage and increase the risk of lung cancer.

**Medical Conditions Aggravated By Exposure:**

Pre-existing respiratory and skin disorders.

**4. First Aid Measures**

**Eye Contact:** Flush contaminated eye(s) with lukewarm, gently running water for 30 minutes, holding eyelids open. Seek medical attention if irritation persists.

**Skin Contact:** Wash affected area immediately with mild soap and water and continue for 15 minutes. If irritation persists, seek immediate medical attention. Remove any contaminated clothing and launder clothing before reuse.

**Inhalation:** If victim has been exposed to vapors remove to fresh air. If breathing has stopped, a trained person should perform artificial respiration. Get medical attention immediately.

**Ingestion:** If small amounts have been ingested, **do not induce vomiting**. Dilute contents of stomach with 1-2 glasses of water. If large amounts have been ingested, see a doctor immediately for gastric lavage with a cuffed endotracheal tube. If vomiting occurs naturally have victim lean forward to reduce risk of aspiration. Seek immediate medical attention.

**5. Fire Fighting Measures**

<b>Flash point:</b>	Not Applicable
<b>Autoignition temperature:</b>	Not applicable. See information under "Fire Fighting Instructions"

**Lower Explosive Limit:** 4% (Hydrogen)  
**Upper Explosion Limit:** 75% (Hydrogen)  
**Sensitivity to Impact:** Not sensitive.  
**Sensitivity to Static Discharge:** Hydrogen gas is sensitive.

**Hazardous Combustion Products:** Burning may produce oxides of sulphur, hydrogen and lead, lead oxides and oxides of various lead impurities.

**Extinguishing Media:** No specific recommendation. Use media to suppress surrounding fire.

**Fire Fighting Instructions:** Do not enter confined fire space without proper personal protection. Use approved positive pressure self-contained breathing apparatus. Do not use water except as a fog. Cool surrounding containers with water spray. Prevent runoff to sewers and waterways.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:**

HEALTH: 3 - Very short exposure could cause serious temporary or residual injury requiring immediate attention.

FLAMMABILITY: 0 - Will not burn.

REACTIVITY: 1 - Normally stable but can become unstable at elevated temperatures and pressures, or may react non-violently with water.

SPECIFIC HAZARDS: Corrosive, toxic

## **6. Accidental Release Measures**

**Personal Protection:** Evacuate unnecessary personnel from spill area. Wear appropriate personal protective equipment. Ventilate area. Do not touch spilled product without proper personal protection. See Section 8 for proper protective equipment to be worn while cleaning an accidental spill.

**Environmental Precautions:** Implement spill control plan. Stop or reduce leak if safe to do so. Prevent from entering sanitary or storm sewers, waterways, or confined spaces. Use inert materials such as earth or sand to form dike. Keep from contacting aquatic life.

**Remedial Measures:** Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Use all appropriate personal protective equipment. For small spills: absorb with neutralizing materials such as soda ash or lime and collect in sealed containers. Flush area with water. For large spills, contain and collect spilled material if possible. Notify government occupational health and safety and environmental authorities as per applicable regulations.

## **7. Handling and Storage**

**Handling Procedures:** Handle the battery with care. Rough treatment or dropping may cause a fracture in the battery case releasing electrolyte. Should this occur, avoid all skin contact. Store in a well-ventilated area away from extreme heat, sparks, or open flames.

Take care not to short circuit battery terminals. Do not cover battery terminals with materials such as clothing, sleeping bags, or rags. Do not recharge battery in damp, moist areas.

Wash face and hands thoroughly after handling and before eating, drinking, or using tobacco products.

**Storage:** Store in a well-ventilated area away from extreme heat, sparks, or open flames. Store away from incompatible materials. Electrolyte contact with combustible or organic materials may cause fire or explosion. Electrolyte may react violently with strong reducing agents, metals, sulphur trioxide gas and water. Contact with metals may produce toxic sulphur dioxide and flammable hydrogen gas. Keep storage area separate from populated work areas.

## 8. Exposure Controls, Personal Protection

**Engineering Controls:** Use general or local exhaust ventilation to maintain exposure below the exposure limits.

**Respiratory Protection:** If respiratory protection is required, NIOSH recommends for sulphuric acid vapour or mist in air:

Up to 25 ppm: Chemical cartridge respirator with inorganic acid cartridge(s), powered air-purifying respirator with appropriate cartridge(s), Supplied Air Respirator (SAR), or a full face-piece SCBA. IDLH Conditions (25 ppm) or Planned Entry in Unknown Concentrations: Positive pressure, full face-piece SCBA, or positive pressure full face-piece SAR with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister, or escape type SCBA.

NOTE: Air purifying respirators do not protect against oxygen deficient atmospheres.

**Skin protection:** Wear impervious gloves and boots and/or other protective clothing according to circumstances.

**Eye and Face Protection:** Eye protection is required. Chemical safety goggles are recommended. The wearing of contact lenses is not recommended.

**Footwear:** As required by worksite rules.

**Other:** Have a safety shower and eye wash station readily available in the immediate work area.

## 9. Physical and Chemical Properties

For electrolyte:

<b>Appearance:</b>	Colourless to yellow-brown liquid	<b>Vapour Density:</b>	Low
<b>Odour:</b>	Sharp acrid odor	<b>Freezing Point:</b>	-40 °C
<b>Odour Threshold:</b>	Not determined	<b>Boiling Point:</b>	110 °C
<b>pH:</b>	< 1	<b>Critical Temperature:</b>	Not applicable.
<b>Vapour Pressure:</b>	Not determined	<b>Relative Density:</b>	1.265 (water = 1)
<b>Solubility:</b>	Completely soluble in water	<b>Partition Coefficient:</b>	Soluble in water
		<b>Evaporation Rate:</b>	Not determined

## 10. Stability and Reactivity

**Chemical Stability:** Stable. Avoid heat – releases toxic gases with heat.

**Incompatibility:** Very corrosive to most metals, producing flammable hydrogen gas. Reacts violently with bases to produce heat. Reacts with reducing agents to produce heat, fire and flammable hydrogen gas. Reacts with oxidizing agents to produce heat. Reacts with carbides, turpentine, phosphorus hydrogen sulphide, organic materials, and alkalis. Contact with explosives may cause detonation. Reacts with cyanides to produce toxic cyanide gas, and sulphides to produce toxic hydrogen sulphide gas.

**Hazardous Decomposition Products:** Thermal decomposition liberates toxic corrosive fumes of sulphur trioxide and water.

**Hazardous Polymerization:** Will not occur

## 11. Toxicological Information

<b>Acute Exposure:</b>	See Section 2 for acute LD <sub>50</sub> and LC <sub>50</sub> values.
<b>Chronic Exposure:</b>	See Section 3.
<b>Exposure Limits:</b>	See Section 2.
<b>Irritancy:</b>	See Section 3.
<b>Sensitization:</b>	See Section 3.
<b>Carcinogenicity:</b>	Many lead compounds are possible carcinogens.
<b>Teratogenicity:</b>	No reports.
<b>Reproductive toxicity:</b>	Lead compounds are possible reproductive toxins.
<b>Mutagenicity:</b>	Inconclusive results.
<b>Synergistic products:</b>	None reported.

## 12. Ecological Information

<b>Environmental toxicity:</b>	
Sulphuric Acid:	LC50 Flounder 100 to 330 mg/l/48 hr aerated water/ Conditions of bioassay not specified. LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified, LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified
Lead Oxide (litharge):	LC50 Gambusia affinis (Western mosquitofish) >56,000 mg/L/96 hr; static /formulated product
<b>Biodegradability:</b>	
Sulphuric Acid:	Aquatic Fate: Since sulfuric acid is miscible with water, the presence of water in the soil or falling as precipitation at the time of the spill will influence the rate of chemical movement in the soil. ... Dilution through mixture with water will decrease the viscosity more than the mass density. This will have the net effect of increasing the velocity of downward movement in the soil. ... Upon reaching the groundwater table, the acid will continue to move in the direction of groundwater flow and downward since its mass density exceeds that of water. Sulfuric acid will ultimately react with calcium and magnesium in water to form sulfate salts. During transport through the soil, sulfuric acid can dissolve some of the soil material, in particular carbonate-based materials.
Lead Oxide (litharge):	TERRESTRIAL FATE: Lead oxide will not leach in soil because of its low solubility. In soil, lead oxide is expected to convert to more insoluble forms such as PbSO <sub>4</sub> , Pb <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub> , and PbS. It also forms complexes with organic matter and clay minerals that limits its mobility. AQUATIC FATE: If released into water, lead oxide will partly settle out due to its low solubility. In the dissolved state it will form ligands, the dominant ones varying with pH. In freshwater systems, the most important ligands are HCO <sub>3</sub> , CO <sub>3</sub> , OH and (OH) <sub>2</sub> , whereas in seawater they are Cl, CO <sub>3</sub> , (OH), (OH) <sub>2</sub> , Cl <sub>2</sub> , and CL <sub>3</sub>

### 13. Disposal Considerations

Place used and contaminated material and packagings into suitable containers and dispose of as controlled waste. Review and follow all local, provincial, and national regulations.

### 14. Transport Information

BATTERIES, WET, NON-SPILLABLE. This battery meets the requirements of Special Provision A67 of the IATA Regulations, Special Provision 39(2) of the Canadian Transport of Dangerous Goods, Clear Language Regulations, and Part 173.159 of 49CFR and may be shipped as non-regulated..

### 15. Regulatory Information

**CANADIAN FEDERAL REGULATIONS:**

**CEPA, DOMESTIC SUBSTANCES LIST:** All ingredients are listed.

**WHMIS CLASSIFICATION:** D1A, D2B, E

### 16. Other Information

**Original Preparation Date:** August 18, 2008

**Prepared by:** Kel-Ex Agencies Ltd., 319 Lynn Avenue, North Vancouver, B.C., V7J 2C4

**Comments:** The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. GFX Power Inc., expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy or completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

**Revisions:** Reviewed and re-issued July 15, 2011