BRIERLY TECHNOLOGIES INC
VALVE REGULATED GEL LEAD ACID BATTERIES
(NON-SPILLABLE)

Brierly Technologies Inc.
5109 Harvester Rd, B8
Burlington, ON CANADA
+1 905 636 9865

FOR EMERGENCIES INVOLVING DANGEROUS GOODS: Spill, Leak, Fire, Exposure or Accident
Call CANUTEC's 24-Hour Number:
1-888-226-8832 (Canada and US) and/or
1-613-996-6666 (International)
*666 on a cellular phone

1. IDENTIFICATION:

Product Identification : **Gel Lead Acid Battery**

Chemical/Trade Name (as used on label) : **Lead Acid Battery, Non-Spillable**

Chemical Family/Classification : **Electric Storage Battery**

CAS Number : **Not Applicable**

2. HAZARDS IDENTIFICATION:

GHS Classification:

Health	Environmental	Physical
Acute Toxicity – Category 4 Skin Corrosion – Category 1A Eye Damage – Category 1 Reproductive – Category 1A Carcinogenicity (lead)– Category 1B Carcinogenicity (arsenic)– Category 1A Carcinogenicity(acid mist)–Category1A Specific Target Organ Toxicity (repeated exposure) –Category 2 GHS Label: 	Aquatic Chronic – 1 Aquatic Acute – 1	Explosive Chemical, Division 1.3
Signal Word: DANGER !		

Hazard Statements	Precautionary Statements
Health Harmful if swallowed, inhaled, or in contact with skin. Causes severe skin burns and eye damage. Causes serious eye damage. May damage fertility or the unborn child if ingested or inhaled. May cause cancer if ingested or inhaled. Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure if ingested or inhaled. May cause harm to breast-fed children. **Environmental** Very toxic to aquatic life with long lasting effects. **Physical** May form explosive air/gas mixture during charging. Extremely flammable gas (hydrogen). Explosive; fire, blast or projection hazard. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.	**Prevention** Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing, eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Causes skin irritation, serious eye damage. Contact with internal components may cause irritation or severe burns. Avoid contact with internal acid/gel. Irritating to eyes, respiratory system, and skin. Avoid contact during pregnancy/while nursing. **Response** IF SWALLOWED OR CONSUMED: rinse mouth, Do NOT induce vomiting. Call a poison center/doctor if you feel unwell. IF ON CLOTHING OR SKIN (or hair): Remove/Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed/concerned, or if you feel unwell seek medical attention/advice. **Storage and Disposal** Store locked up, in a well-ventilated area. In accordance with local and national regulation. Avoid release to the environment. Collect spillage. Dispose of contents/container in accordance with local/ regional/national/international regulations. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Use only outdoors or in well ventilated area Keep out of reach of children.

EMERGENCY OVERVIEW: May form explosive air/gas mixture during charging. Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin. Prolonged inhalation or ingestion may result in serious damage to health. Pregnant women exposed to internal components may experience reproductive/developmental effects.

Additional Information

No health effects are expected related to normal use of this product as sold.

3. COMPOSITION/INFORMATION ON INGREDIENTS:

Components	CAS Number	Approx. % Wt.
Inorganic Lead Compounds		
*Lead	7439-92-1	71.7
Tin	7440-31-5	0.19
Calcium	7440-70-2	0.02
Electrolyte (Hydrogel)		
Sulfuric Acid (Diluted sulfuric acid in solid state)	7664-93-9	19.6
Silicon dioxide	6067-86-0	1.3
Case Material:		
Acrylonitrile Butadiene Styrene (ABS)	9003-56-9	5.2

* Inorganic lead and sulfuric acid are primary components of every battery. Other ingredients may be present depending upon battery type.

4. FIRST AID MEASURES:

Take proper precautions to ensure you own health and safety before attempting to rescue a victim and provide first aid.

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

Skin Contact: Electrolyte: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.
Lead compounds: Wash immediately with soap and water.

Eye Contact: Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes; consult physician immediately

Ingestion: Electrolyte: Give large quantities of water; **do not** induce vomiting; consult physician.
Lead compounds: Consult physician immediately

5. FIRE FIGHTING MEASURES:

Flash Point: Not Applicable

Flammable Limits: LEL = 4.1% (hydrogen gas in air) ; UEL = 74.2%

Extinguishing media: CO_2; foam; dry chemical

Fire Fighting Procedures:
Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid- resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Hazardous Combustion Products:
In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

6. ACCIDENTAL RELEASE MEASURES:

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 un-neutralized acid to sewer.*** Neutralized acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

7. HANDLING AND STORAGE:

Handling:
Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units. No hazards under normal usage as the sulfuric acid is immobilized in a gel structure)

Storage:
Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities which may create flames, sparks, or heat. Keep away from metallic objects that 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.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

	Occupational Exposure Limits (mg/m^3)					
Ingredient:	US OSHA	US ACGIH	US NIOSH	Quebec PEV	Ontario OEL	EU OEL
Inorganic forms of:						
Lead	0.05	0.05	0.05	0.05	0.05	0.15(b)
Tin	2	2	2			
Calcium	N/A	N/A	N/A	N/A	N/A	N/A
Electrolyte (hydrogel:Sulfuric Acid (Diluted sulfuric acid in solid state)	1	0.2	1	1	0.2	0.05(c)
Silicon Dioxide	80 $mg/m^3/\%SiO_2$(d)	N/A	6	6(c)	10(c)	0.1(e)

NOTES:

(a) As dusts/mists **(b)** As inhalable aerosol **(c)** Thoracic fraction **(d)** Potential occupational carcinogen

(e) Based on OEL's of Austria, Belgium, Denmark, France, Netherlands, Switzerland, & U.K.

(f) Based on OEL of Belgium **(g)** Based on OEL of Netherlands

Engineering Controls (Ventilation):
Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.
Handle batteries cautiously. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when charging or handling batteries.

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

Respiratory Protection (NIOSH/MSHA approved):
None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA-approved respiratory protection..

Skin Protection:
None required under normal conditions. If battery case is damaged, rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection:
None required under normal conditions. If battery case is damaged, chemical goggles or face shield

Other Protection:
Under severe exposure or emergency conditions, wear acid-resistant clothing, gloves, and boots.
In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

9. PHYSICAL AND CHEMICAL PROPERTIES – ELECTROLYTE:

Boiling Point@760 mm	112°C		Density	1.30 g/cm^3
Point of Solidification	-69°C		Vapor Pressure (mm Hg)	15.8
% Solubility in Water	100		pH	Less than 1
Evaporation Rate (Butyl acetate=1)	Less Than 1		Vapor Density (AIR=1)	Greater than 1
			Viscosity	Not applicable
Appearance and Odor	A white translucent gel; no apparent odor. A battery is a manufactured article.		% Volatiles by Volume @70^{o}F	Not Applicable

10. STABILITY & REACTIVITY DATA:

Stability: Stable X
Unstable ___

Conditions to Avoid: Prolonged overcharge at high current; sources of ignition.

Incompatibilities: (materials to avoid)

Electrolyte (Water and Sulfuric Acid Solution): 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.

Hazardous Decomposition Products:

Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.

Lead compounds: Temperatures above the melting point are 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

11. TOXICOLOGICAL DATA:

Routes of Entry:

Electrolyte: Harmful by all routes of entry.

Lead compounds: Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Acute Toxicity:

Inhalation LD : Electrolyte: LC rat: 375 mg/m3; LC : guinea pig: 510 mg/m3

Elemental Lead: Acute Toxicity Point Estimate = 4500 ppmV (based on lead bullion)

Oral LD50: Electrolyte: rat: 2140 mg/kg

Elemental lead: Acute Toxicity Estimate (ATE) = 500 mg/kg body weight (based on lead bullion)

Inhalation:

Electrolyte: 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:

Electrolyte: 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.

Skin Contact:

Electrolyte: Severe irritation, burns, and ulceration.
Lead compounds: Not absorbed through the skin.

Eye Contact:

Electrolyte: Severe irritation, burns, cornea damage, blindness.

Lead compounds: May cause eye irritation.

Additional Information:

Medical Conditions Generally Aggravated by Exposure:
Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of electrolyte (water and sulfuric acid solution) with skin may aggravate skin diseases such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

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 VIII. Follow good personal hygiene to avoid inhalation and ingestion: wash hands, face, neck and arms thoroughly before eating, smoking or leaving the work site. 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 nor laundered with personal non-contaminated clothing.

This product is intended for industrial use only and should be isolated from children and their environment.

12. 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 LC_{50}, freshwater fish (*Brachydanio rerio*): 82 mg/L
	96 hr- LOEC, freshwater fish (*Cyprinus carpio*): 22 mg/L
Lead:	48 hr LC_{50} (modeled for aquatic invertebrates): <1 mg/L, based on lead bullion

13. DISPOSAL INFORMATION *(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. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).

Electrolyte: Place neutralized slurry into sealed acid resistant containers and dispose of as hazardous waste, as applicable. 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.

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

14. TRANSPORT INFORMATION:

Per DOT (49 CFR 173.159), ADR/RID, IATA (Special Provision A67), ICAO and IMDG (Special provision 238.1 and 238.2) rules and regulations, BTI nanoGEL Lead Acid Batteries are exempt from hazardous classifications as a result of successful completion of the following tests: 1) Vibration Tests; 2) Pressure differential tests; 3) Rupture tests (no free liquids). The batteries must be shipped in a condition that would protect from short circuits and be securely packed so as to withstand conditions normal to transportation.

UN No:	
Proper Shipping Name:	Not Restricted
Class:	Exempted from the requirements because batteries have passed
Packing Group	the Vibration and Pressure Differential Tests for Non-Spillable
Label:	designation.

15. REGULATORY INFORMATION:

UNITED STATES:

EPA SARA Title III:

Section 302 EPCRA Extremely Hazardous Substances (EHS):

Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of 1,000 lbs. EPCRA Section 302 notification is required if 500 lbs or more of sulfuric acid is present at one site (40 CFR 370.10). For more information consult 40 CFR Part 355.

Section 304 CERCLA Hazardous Substances:

Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is 1,000 lbs. State and local reportable quantities for spilled sulfuric acid may vary.

Section 311/312 Hazard Categorization:

EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of 500 lbs or more and/or if lead is present in quantities of 10,000 lbs or more. For more information consult 40 CFR 370.10 and 40 CFR 370.40

Section 313 EPCRA Toxic Substances: 40 CFR section 372.38 (b) states: If a toxic chemical is present in an article at a covered facility, a person is not required to consider the quantity of the toxic chemical present in such article when determining whether an applicable threshold has been met under § 372.25, § 372.27, or § 372.28 or determining the amount of release to be reported under § 372.30. This exemption applies whether the person received the article from another person or the person produced the article. However, this exemption applies only to the quantity of the toxic chemical present in the article.

Supplier Notification: This product contains toxic chemicals that may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements. For a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:

Toxic Chemical	CAS Number	Approximate % by Weight
Lead	7439-92-1	71.7
Sulfuric Acid	7664-93-9	19.6

See 40 CFR Part 370 for more details.

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).

STATE REGULATIONS (US):
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. Wash hands after handling.

*Battery companies not party to the 1999 consent judgment with Mateel Environmental Justice Foundation should include a Proposition 65 Warning that complies with the current version of Proposition 65.

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.

16. OTHER INFORMATION:

NFPA Hazard Rating for sulfuric acid:
Flammability (Red) = 0
Health (Blue) = 3
Reactivity (Yellow) = 2

Sulfuric acid is water-reactive if concentrated.