



Alternative Energy Store, Inc
Boxborough, MA 01719
USA

Tel: +1.978.562.5858 Fax: +1.978.562.5854
Date Jan 4, 2021

MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification

Chemical product identification

Product name KiloVault 2100 PLC (**Valve Regulated Maintenance Free Lead-Acid Batteries**)

Recommended Use: Lead acid battery. Lead Acid (Non-spillable) Battery

Manufacturer: Alternative Energy Store, Inc. (d/b/a altE)

Address: 330 Codman Hill Rd, Boxborough, MA 01719 **Tel:**

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2. Hazards Identification

Not dangerous with normal use. Do not dismantle, open or shred VRLA battery. Exposure to the ingredients contained within or their ingredients products could be harmful.

Primary routes of exposure: These chemicals are contained in a sealed can. The following information is provided for battery acid and lead exposure that may occur during battery production or container breakage or under extreme heat conditions such as fire. Risk of exposure can also occur if the battery is mechanically, thermally or electrically abused. If this occurs, exposure to the lead acid contained within can occur by Inhalation, Ingestion, eye contact and skin contact.

Potential Health Effects:

Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may be harmful by inhalation. Contact with moist mucous membranes of the respiratory system can cause caustic condition resulting respiratory irritation.

Swallow: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin.

Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can be corrosive to the eyes and may cause severe damage including blindness.

Other hazards: Lead may damage kidney function, the blood forming system and the reproductive system. Avoid repeated exposure. Severe exposures can lead to shock, circulatory collapse, and death. Lead poisoning is characterized by a metallic taste in the mouth, loss of appetite indigestion, nausea, vomiting, constipation, sleep disturbances and overall weakness.



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3. Composition. Information on Ingredients

Battery is a mixture of:

Chemical Name	CAS-No	Weight %
Lead	7439-92-1	65~75
Sulfuric acid	7664-93-9	10~20
ABS resin	9003-56-9	~5
Tin	7440-31-5	<0.5
Calcium	7440-70-2	<0.1

4. First Aid Measures

Description of first aid measures

General information First aid is upon rupture of sealed battery.

After inhalation

Move to fresh air. Call a physician or Poison Control Center immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

After swallowing

Immediate medical attention is required. Call a physician or Poison Control Center immediately. Do NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Remove from exposure, lie down.

After skin contact

Immediate medical attention is required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.

After eye contact

Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area.

Protection of First Aiders

Use personal protective equipment. Avoid contact with skin, eyes and clothing.

5. Fire Fighting Measures

Flash Point: Hydrogen – 259 °C

Auto Ignition: Hydrogen – 580 °C

Flammable Limits: LEL = 4.1% (Hydrogen Gas in air) ; UEL = 74.2%

Suitable extinguishing agents: Use extinguishing agent suitable for local conditions and the surrounding environment.

Uniform Fire Code: Corrosive: Acid-Liquid

Hazardous Combustion Products: Hazardous metal fumes and oxides

Explosion Data Sensitivity to Mechanical Impact: No

Sensitivity to Static Discharge: No

Specific Hazards Arising from the Chemical: The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion, do not breathe fumes.

Advice for Firefighters Protective Equipment: Wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.



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6. Accidental Release Measures

Personal Precautions: Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not get in eyes, on skin, or on clothing.

Environmental Precautions: Refer to protective measures listed in Sections 7 and 8.

Methods for Containment: Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up: In case of rupture: Use personal protective equipment. Dam up. Soak up with inert absorbent material. Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly.

7. Handling and Storage

Handling: Handle in accordance with good industrial hygiene and safety practice.

Storage: Keep containers tightly closed in a dry, cool and well-ventilated place.

Charging: There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Turn off power to chargers whenever not in use, and before detachment of any circuit connections. Batteries being charged may generate and release flammable hydrogen gas. Charging space should be ventilated. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

Other: Follow Manufacturers recommendations regarding maximum recommended currents and operating temperature range. Do not overcharge beyond the recommended upper charging voltage limit. Applying pressure or deforming the battery may lead to disassembly followed by eye, skin and throat irritation.

8. Exposure Controls and Personal Protection

Exposure Guidelines:

Chemical Name	ACGIH TLV(1)	OSHA PEL(2)	NIOSH IDLH(3)
Lead 7439-92-1	TWA: 0.05 mg/m ³	TWA: 50 µg/m ³ Action Level: 30 µg/m ³ Poison, See 29 CFR 1910.1025	IDLH: 100 mg/m ³ TWA: 0.050 mg/m ³
Sulfuric acid 7664-93-9	TWA: 0.2 mg/m ³ thoracic fraction	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	IDLH: 15 mg/m ³ TWA: 1 mg/m ³
Tin 7440-31-5	TWA: 2 mg/m ³	TWA: 2 mg/m ³ Sn except oxides (vacated) TWA: 2 mg/m ³	IDLH: 100 mg/m ³ TWA: 2 mg/m ³

(1) ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value.

(2) OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits.

(3) NIOSH IDLH: Immediately Dangerous to Life or Health.

Engineering Measures: Showers, Eyewash stations, Ventilation systems

Personal Protective Equipment:

Respiratory Protection: Not necessary under normal conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Skin and body Protection: Not necessary under normal conditions. Wear protective gloves/clothing if exposed.

Eye/Face Protection: Not necessary under normal conditions. Wear tightly fitted safety goggles if exposed.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice.



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9. Physical and Chemical Properties

Appearance and Odor: Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.

Odor Threshold: Not applicable.

pH: Not applicable

Boiling Point: Not applicable unless individual components exposed.

Battery Electrolyte (Acid): 230 – 233.6°F (110 112 °C)

Lead: - 3191 °F (1755 °C)

Melting Point Lead: 621.32 °F (327.4 °C)

Specific Gravity(H₂O = 1): 1.215 to 1.350

Flash Point: 498.2 °F (259.0 °C) Hydrogen

Evaporation Rate: < 1

Vapor Pressure(mm Hg@ 20° C): Battery Electrolyte (Acid) 11.7

Flammability:

Hydrogen Flammability Limit Lower - 4.1 %

Flammability Limit Upper – 74.2%

Vapor Pressure: Not applicable.

Vapor Density: 3.4 (Air = 1) Battery Electrolyte (Acid)

Relative Density: 1.21 - 1.3 Battery Electrolyte (Acid)

Solubility: Lead and Lead dioxide are not soluble. 100% battery electrolyte (acid)

% Volatile by Weight: Not applicable unless individual components exposed.

Auto-ignition temperature: 1076 °F (580 °C) Hydrogen.

10. Stability and Reactivity

Chemical stability: The product is stable under normal conditions.

Conditions to Avoid: Exposure to air or moisture over prolonged periods.

Incompatibilities: Incompatible with strong acids and bases. Incompatible with oxidizing agents.

Hazardous Decomcombustible Products: Thermal decomposition can lead to release of toxic/corrosive gases and vapors.

11. Toxicological Information

Irritation: Causes severe irritation and or burns

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sulfuric acid	= 2140 mg/kg (Rat)	-	= 510 mg/m3(Rat) 2 h

Chronic Toxicity: Lead compounds may be absorbed by ingestion, by inhalation and through the skin. Lead may damage kidney function, the blood forming system and the reproductive system. Avoid repeated exposure.

Reproductive Toxicity: Product is or contains a chemical which is a known or suspected reproductive hazard.

Developmental Toxicity: Contains ingredients that have suspected developmental hazards. Inorganic lead compounds can cause developmental damage.



Carcinogenicity: The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Lead	A3	Group 2A	Reasonably Anticipated	x
Sulfuric Acid	A2	Group 1	Known	x
ABS Resin	-	Group 3	-	-

ACGIH: (American Conference of Governmental Industrial Hygienists)

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA: (Occupational Safety & Health Administration)

X -Present

12. Ecological Information

Ecotoxicity: The environmental impact of this product has not been fully investigated.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Lead		LC50: 0.44 mg/L (96 h semi-static) Cyprinus carpio LC50: 1.17 mg/L (96 h flow-through) Oncorhynchus mykiss LC50: 1.32 mg/L (96 h static) Oncorhynchus mykiss		EC50: 600 µg/L (48 h) water flea
Sulfuric Acid		LC50: > 500 mg/L (96 h static) Brachydanio rerio		EC50: 29 mg/L (24 h) Daphnia magna



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13. Disposal Considerations

Waste Disposal Methods: This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261). Should not be released into the environment.

Contaminated Packaging: Do not re-use empty containers.

US EPA Waste Number: D002 D008

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA – D Series Wastes
Lead -7439-92-1	(Hazardous constituent – no waste number)	Included in waste streams: F035, F037, F038, F039, K002, K003, K005, K046, K048, K049, K051, K052, K061, K062, K064, K065, K066, K069, K086, K100, K176	= 5.0 mg/L regulatory level

California Hazardous Waste Codes: 792

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California EHW	California Hazardous Waste	California Waste - Part 2
Lead	-	Toxic	TCLP (for CA Toxicity): 5.0 mg/L
Sulfuric Acid	-	Toxic Corrosive	-
Calcium	Ignitable Reactive	-	-

14. Transport Information

Note: Transportation requirements do not apply once the battery pack has been installed in a vehicle as part of the vehicle’s functional components.

Transportation: Sealed Lead Acid / OPTIMA Battery is not a DOT Hazardous Material

Other: Per DOT, IATA, ICAO, and IMDG rules and regulations, these batteries are exempt from “UN2800” classification as a result of successful completion of the following tests:

- 1) Vibration
- 2) Pressure Differential Tests
- 3) Case Rupturing Tests (no free liquids)

US DOT: Not regulated as dangerous goods per 49 CFR 173.159d

IATA: Not regulated as dangerous goods per Special Provision A67

IMDG: Not regulated as dangerous goods per exception 238

15. Regulatory Information

International Inventories: TSCA complies. DSL not determined.

US Federal Regulations: Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) . This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Lead	7439-92-1	65~75	0.1
Sulfuric Acid	7664-93-9	10~20	1.0



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Clean Water Act: This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Lead	-	x	x	
Sulfuric Acid	1000 lb			x

Clean Air Act Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61): This product contains the following substances which are listed hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act:

Chemical Name	CAS-No	Weight %
Lead	7439-92-1	65~75

CERCLA: This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Lead	10 lb	
Sulfuric Acid	1000 lb	1000 lb

California Proposition 65:

Chemical Name	CAS-No	California Prop. 65
Lead	7439-92-1	Carcinogen Developmental Female Reproductive Male Reproductive
Sulfuric Acid	7664-93-9	Carcinogen

U.S. State Right-to-Know Regulations:

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Lead	x	x	x	x	x
Tin	x	x	x		
Calcium	x	x	x		
Sulphuric Acid	x	x	x	x	x



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Mexico Grade: Minimum risk, Grade 0

Chemical Name	Carcinogen Status	Exposure Limits
Lead	A3	Mexico: TWA= 0.15 mg/m3
Tin	-	Mexico: TWA 2 mg/m3 Mexico: STEL 4 mg/m3
Sulphuric Acid	A2	Mexico: TWA 1 mg/m3

Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class: D2A Very toxic materials E Corrosive material.

Chemical Name	NPRI - National Pollutant Release Inventory
Lead	x
Sulphuric Acid	x

16. Additional Information

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.