

GEL BATTERY

1. IDENTIFICATION

1.1 Product

Trade name: Gel Lead Acid Battery
Industrial electrical storage batteries/cells all OPzV , PzV & PzVB types

- SUNLIGHT Battery/Cell RES SOPzV type
- SUNLIGHT Battery/Cell OPzV type
- SUNLIGHT Battery/Cell PzV type
- SUNLIGHT Battery/Cell PzVB
- SUNLIGHT Battery/Cell S2-GEL

Electrochemical System: Lead Gel (acid)

1.2 Usage

- Telecom systems / Monitoring and control systems at power plants and energy stations / Signaling systems at railway stations, airports and seaports / Emergency lighting systems / Data processing systems / Uninterruptible power supply systems (UPS) / Renewable energy systems (solar, wind and hydro-electric) / Automation systems / Military Applications
- Forklifts / Cleaning machines / Electric tractors / Lifting platforms / Electric vehicles

1.3 Supplier

Name: SYSTEMS SUNLIGHT S.A.
Address: 2 Ermou & Nikis Str, Syntagma Square, 105 63 Athens, Attica, Greece
Phone/Fax: +30 210 6245400 / +30 210 6245409
Factory Name: SUNLIGHT MANUFACTURING PLANT
Address: 67 200 Neo Olvio Xanthi
Phone/Fax: +30 25410 48100 / +30 25410 95446

1.4 Contact in case of emergency

In case of medical emergencies, please contact your local poison control center
Contact telephone number for SYSTEMS SUNLIGHT S.A.: +30 25410 48100
Internet: www.systems-sunlight.com section "contact"

2. Hazards Identification

2.1 Classification of the substance or mixture

Material is an article. No health effects are expected during normal use of this product as sold. Hazardous exposure may occur when the product is heated, oxidized or otherwise processed, damaged or subjected to misuse. Follow Sunlight's instructions for installation, service and use. No hazards occur during the normal operation of a Lead Acid Battery (gel electrolyte) as it is described in the instructions for use that are provided with the battery.

Lead acid Batteries have three significant characteristics:

- They contain gel which contains diluted sulphuric acid. Sulphuric acid may cause severe chemical burns.
- During the charging process or during operation they might develop hydrogen gas and oxygen, which under certain circumstances may result in an explosive mixture.

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- They can contain a considerable amount of energy, which may be a source of high electrical current and a severe electrical shock in the event of a short circuit. Note: The Batteries have to be marked with the symbols listed under section 15.








2.2 Other hazards

Under normal conditions of use, no health effects are expected.

Adverse human health effects and symptoms:

	Acute	Chronic
<i>Inhalation</i>	Contents of an open battery can cause respiratory irritation.	Repeated and prolonged exposure may cause irritation.
<i>Eye</i>	Exposure to dust may cause irritation.	No data available.
<i>Ingestion</i>	Lead ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping.	No data available

3. Composition and Information on the main Ingredients¹⁾

CAS no.	Material Description	Content [% of weight]	Hazards Category and Statement Code, GHS pictograms
7439-92-1	Lead Grid (metallic lead ² , lead alloys with possible traces of additives)	~ 30	 Dgr Repr. 1A - H360Df Lact- H362
n.a.	Active Mass 3 (Battery Oxide, inorganic lead compounds)	~ 30	   Dgs Repr. 1A - H360Df Acute Tox. 4 - H332 Acute Tox. 4 - H302 STOT RE 2 - H373 Aquatic Acute 1 - H400 Aquatic Chronic 1 H410
7664-93-9	Electrolyte/sulphuric acid 4 (Battery Gel)	~ 20	 Dgs SkinCorr.1A - H 314
7631-86-9	Silicon dioxide	~ 10	  H319 Eye damage/Eye irritation, H335 Respiratory Irritation, H373 Organs (lung) damage.

¹ Contents may vary due to performance data of the battery/cell

² Lead metal (CAS 7439-92-1) is classified as a substance of very high concern under REACH

³ Composition of active mass depends on the state of charge

⁴ Density of the electrolyte varies in accordance to the state of charge

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n.a.	Plastic Container / Plastic Parts 5	~ 10	
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4. First Aid Measures

4.1 Description of first aid measures:

Electrolyte (diluted sulphuric acid): sulphuric acid acts corrosively and damages skin
 Lead compounds: lead compounds are classified as toxic for reproduction (if swallowed)

4.1.1 Gel Electrolyte (Sulphuric acid)

Skin Contact: rinse with water, remove and wash wetted clothing

Inhalation: inhale fresh air, seek advice of a medical doctor

Eye Contact: rinse under running water for several minutes, seek advice of a medical doctor

after swallowing: drink lot of water immediately, swallow activated carbon, do not induce vomiting, seek advice of a medical doctor

4.1.2 Lead compounds

Skin Contact: clean with water and soap

Inhalation: inhale fresh air, seek advice of a medical doctor

Eye Contact: rinse under running water for several minutes, seek advice of a medical doctor

Swallowing: wash mouth with water, seek advice of a medical doctor

5. Fire – Fighting Measures

Unusual Fire and Explosion Hazards: Hydrogen and Oxygen gases are produced in cells during normal battery operation and expel into air through vent caps.

Suitable fire extinguishing agents: Dry powder extinguishing agents, carbon dioxide foam, CO₂.

Unsuitable fire extinguishing agents: Water. Do not use water on live electrical circuits

Special protective equipment: Protective goggles, respiratory protective equipment, acid protective equipment, acid proof clothing in case of larger stationary battery plants or where larger quantities are stored.

⁵ Composition of the plastic container may vary due to different customer requirements

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Special Firefighter Procedures

Use Positive Pressure, self-contained breathing apparatus.

Note: Hydrogen Flash point: -259°C. Hydrogen Auto ignition point: 580°C Hydrogen Flammable Limits in Air (% by Volume): Lower Explosion Limit (LEL) : 4.1 ; Upper Explosion Limit (UEL) : 74.2

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Eye Protection Chemical goggles, safety glasses with side shields and or a full-face shield.

Protective gloves Rubber, PVC or neoprene

Respiratory Protection Approved acid mist/organic vapor respirator.

Other Protective Equipment Acid resistant apron or clothes.

Note: Personal Protective Equipment advice is contained in Section 8 of the BIS.

6.2 Environmental precautions.

Prevent entry into waterways, sewers, basements or confined areas. Runoff from fire control and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

6.3 Methods and materials for containment and cleaning up.

6.3.1 *For Containment* In the event of a battery rupturing; stop the leak if you can do it without risk. Absorb with earth, sand or other non-combustible material. Cautiously neutralize spilled liquid.

6.3.2 *For Cleaning up* Dispose of in accordance with local, State, and national regulations.

7. Handling and Storage

Handling: Keep away from heat, sources of ignition and from flames during and immediately after charging. Combustion or overcharging may create hazardous gases and liquids. Wash hands thoroughly after use. Do not use organic solvents; use only manufacturer recommended cleaners on the batteries. Avoid sparks. Do not remove vent caps. Do not double stack industrial batteries, it may cause damage.

Storage: Store batteries in a cool, dry area. Store batteries in a covered area that protects against adverse weather conditions. Protect batteries from coming into contact with conductive materials to prevent fire or battery failures. Keep away from fire, sparks and heat sources. Protect from damage to prevent possible leaks or spills. It is imperative that these instructions be followed if the batteries are being stored.

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- Other Precautions:** GOOD PERSONAL HYGIENE AND WORK PRACTICES ARE MANDATORY. Refrain from eating, drinking or smoking in work areas. Thoroughly wash hands, face, neck, and arms before eating, drinking or smoking. Launder soiled clothing before reuse. Emptied batteries contain hazardous sulfuric acid residue.
- Personal Precautions:** Acid resistant aprons, boots and protective clothing. Safety glasses with side shields/face shield recommended. Ventilate enclosed areas.

8. Exposure controls/personal protection

8.1 Appropriate engineering controls

Store batteries with adequate ventilation. Room ventilation is also required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.

Substance name	EC-No.	CAS-No	Description
Lead	231-100-4	7439-92-1	No exposure to lead and lead containing battery paste during normal conditions of use.
Sulfuric Acid	231-639-5	7664-93-9	R-phrases: R35 causes severe chemical burns S-phrases: S2:Keep out of reach of children S16:Keep away from sparks or naked flame, No smoking S26:In case of contact with eyes rinse immediately with plenty of water and seek medical advice S45:In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

8.2 Individual protection measures

Personal Protective Equipment:

During installation under normal conditions there is no exposure to lead or sulphuric acid. In the event of battery breakage, exposure to sulphuric acid and lead may occur. During high rate charges or overcharging acid mist may occur.

Eye/Face Protection: Chemical goggles, safety glasses with side shields and or a full-face shield.

Protective gloves: Rubber, PVC or neoprene

Respiratory Protection: Approved acid mist/organic vapor respirator

Other Protective Equipment: Acid resistant apron or clothes.

Work Practices:

Use standard lead-acid battery practices. Do not wear metallic jewelry when working with batteries. Use non-conductive tools only. Discharge static electricity prior to working on a battery. Maintain eyewash, fire extinguisher and emergency communication device in the work area.

9. Physical and Chemical Properties

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Item	Lead and lead compounds	Electrolyte
Appearance	Form:	Liquid
	Color:	Colorless
	Odor:	
PH	N/A	
Melting point/freezing point.	> 300 °C (melting point)	-30 to -60 °C
Initial boiling point and boiling range.	> 1700 °C (lit.)	> 100°C
Flash point.	N/A	
Evaporation rate.	N/A	
Vapor pressure. (mm Hg at 20°C)	N/A	
Vapor density.(Air=1)	N/A	
Density (30°C)	N/A	1.2 to 1.3 g/cm ³
solubility in water :	Very low	Fully soluble*
Partition coefficient: n-octanol/water.	N/A	
Decomposition temperature.	N/A	
<p><i>Lead and Lead compounds used in Lead Acid batteries are poorly soluble in water; Lead can be dissolved in an acidic or alkaline environment only.</i></p> <p>* Gel electrolyte is not soluble.</p>		

10. Stability and Reactivity
10.1 Reactivity:

Broken batteries may result in small amounts of spilled gel electrolyte. Gel electrolyte is a corrosive, nonflammable liquid. Gel electrolyte can destroy organic materials such as cardboard, wood, textiles. Gel electrolyte may produce hydrogen as a reaction with some metals.

10.2 Chemical Stability:

The battery and contents are stable under normal conditions.

10.3 Possibility of hazardous reactions:

Hazardous polymerization will not occur.

10.4 Conditions to avoid:

Overheating or overcharging the battery may results in acid mist and hydrogen generation.

10.5 Incompatibility (materials to avoid):

Strong alkaline materials, conductive metals, organic solvents, spark or open flame.

10.6 Hazardous decomposition products:

Hydrogen gas may be generated in an overcharged condition, in fire or at very high temperatures. In fire, may emit CO, CO₂ and Sulfur Oxides.

11. Toxicological Information

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11.1 Information on toxicological effects:

SUNLIGHT Gel batteries are sealed, recombinant design that require no water replacement throughout their service life, thus no contact is made with the battery's internal components or chemical hazards. Under normal use and handling, these batteries do not emit regulated or hazardous substances.

11.2 Routes of exposure:

	Acute	Chronic
Inhalation	Under normal conditions of use, no health effects are expected. Contents of an open battery can cause respiratory irritation.	Repeated and prolonged exposure may cause irritation.
Skin	Under normal conditions of use, no health effects are expected.	No data available
Eye	Under normal conditions of use, no health effects are expected. Exposure to dust may cause irritation.	No data available.
Ingestion	Under normal conditions of use, no health effects are expected. Lead ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping.	No data available

12. Ecological Information

This information is of relevance if the battery is broken and the ingredients are released to environment.

12.1 Gel electrolyte (sulphuric acid): In order to avoid damage to the sewage system, the acid has to be neutralized by means of time or sodium carbonate before disposal. Ecological damage is possible by change of pH. The electrolyte solution reacts with water and organic substances, causing damage to flora and fauna. The electrolyte may also contain soluble components of lead that can be toxic to aquatic environments.

12.2 Lead and Lead compounds: Chemical and physical treatment is required for the elimination from water. Waste water containing lead must not be disposed of in an untreated condition.

13. Disposal considerations

Lead Acid Battery Do not dispose as household waste.

Used Lead acid batteries (EWC 160601*) are subject to regulation of the EU Battery Directive and its adoptions into national legislation on the composition and end of life management of batteries.

Used Lead acid batteries are recycled in lead refineries (secondary lead smelters). The components of a used Lead acid battery are recycled or reprocessed. Follow local and National regulations to dispose.

Sulfuric Acid Dispose as chemical compound- do not pollute the environment

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Lead and lead compounds

Dispose as chemical compounds- do not pollute the environment

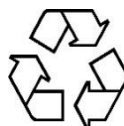
14. Transport information

Per DOT, ADR/RID, IATA, ICAO and IMDG rules and regulations, SUNLIGHT OPzV 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) case rupturing tests (no free liquids). The batteries must be shipped in a condition that would protect from short circuits, and be securely packaged so as to withstand conditions normal to transportation

UN No: "NOT RESTRICTED" according to Special Provision A67
Proper shipping name: Excepted from the requirements because batteries have passed the Vibration and Pressure Differential performance tests for Non spillable designation.
Class :
Packing Group:
Label:

15. Regulatory information

In accordance with EU Battery Directive and the respective national legislation, Lead-Acid batteries have to be marked by a crossed out dust bin with the chemical symbol for lead shown below, together with the ISO return/recycling symbol.



Crossed - out wheeled bin indicating "SEPARATE COLLECTION" for all batteries and accumulators. Not to be disposed of with general domestic, commercial or industrial waste.
Ref: The Batteries Directive 2006/66/EC

The Pb symbol indicates the heavy metal
The Pb symbol indicates the heavy metal content of the battery and enables the Lead-Acid battery to be sorted for recycling.
Ref: The Batteries Directive 2006/66/EC.

The International Recycling Symbol, required by law in many countries world-wide to facilitate the identification of secondary batteries and accumulators for recycling.
Ref: IEC 61429 : 1995, Marking of secondary cells and batteries with the International Recycling Symbol ISO 7000-1135.

Directive 2006/66/EC, on batteries and accumulators and waste batteries and accumulators:
"Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment does not apply to batteries and accumulators used in electrical and electronic equipment."

16. Other information

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16.1 Safety Data Sheet

The European Directive 91/155/EEC which described the requirements for Material Safety Data Sheets had been repealed by the Regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals on June 1st, 2007 (REACH-Regulation 1907/2006/EC, Art. 31). The requirement to publish a Safety Data Sheet applies to all suppliers of substances and preparations.

As already defined under the former Directive there is no requirement to develop and maintain a Safety Data Sheet for products such as Batteries.

16.2 Substances of Very High Concern (SVHC)

The publications of the European Chemicals Agency on substances of very high concern are monitored by Systems Sunlight S.A. As defined by REACH, customers will receive the required information if an updated publication may add a substance relevant for our products to the list of SVHC's. On 19 December 2012, four Lead compounds used in the process of battery manufacturing – Lead Monoxide, Lead Tetroxide, Tetralead Trioxide Sulphate and Pentalead Tetraoxide Sulphate – were added to the list of Substances of Very High Concern. As of June 27 2018, Lead Metal was added to the SVHC list as well.

Irrespective of the battery design (flooded, MHF, Gel, AGM) all lead based batteries contain Lead Metal (CAS Nr.: 7439-92-1). The content varies but exceeds the notification threshold of 0,1% w/w.

Batteries ready for use do not contain Oxides or Sulphates that are classified SVHC.

Dry Batteries/dry cells (dry charged plates, delivered without electrolyte) contain more than 0,1 % of Lead Monoxide. Lead Monoxide (CAS Nr.: 1317-36-8) is listed as a substance of very high concern. Once the batteries / cells are filled with electrolyte all Lead Monoxide is transformed and the presence of Lead Monoxide has ended.

16.3 GHS labels

Among others the European GHS regulation describes classification and labelling of chemicals and preparations. GHS is not a regulation that describes labelling requirements for products such as Lead Acid Batteries.

The six pictograms on batteries target to provide safety information and are based on an international standard (EN 50342). These labels remain unaffected.

16.4 General

The information given above is provided in good faith based on existing knowledge and does not constitute an assurance of safety under all conditions. It is the user's responsibility to observe all laws and regulations applicable for storage, use, maintenance or disposal of the product. If there are any queries, the supplier should be consulted.

However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. H314: Causes severe skin burns and eye damage.

All information provided herein is deemed reliable and is intended to ensure optimal protection during transport, handling and storage of our products.

However, the present should not be considered as a warranty or quality specification.

This information relates to the specific materials designated and may not be valid for such material used in combination with an other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his particular use.

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SYSTEMS SUNLIGHT S.A. does not accept liability for any loss or damage that may occur, whether direct, indirect or consequential, from the use of this information.