

LEAD ACID BATTERY**1. IDENTIFICATION****1.1 Product identifier** Lead Acid Cell/Battery

Commercial Product Name Industrial/Commercial electrical storage batteries

Product Code NA

Electrochemical System: Lead Acid

1.2 Usage Forklifts / Cleaning machines / Electric tractors / Lifting platforms / Electric vehicles / Telecom systems / Monitoring and control systems in 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) / Automation systems**1.3 Details of the supplier of the safety data sheet**

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

*Responsible/issuing person: SYSTEMS SUNLIGHT S.A.***1.4 Emergency telephone number**

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****Lead acid battery***Current and voltage:* Battery produces uncontrolled current when the protected terminals are shorted. Current flow can cause sparks, heating and possibly fire.*Explosion Hazard:* Flammable/explosive hydrogen gas is liberated during the operation of batteries (explosive mixtures with air 4-74%v/v, lower explosion limit threshold 4%v/v). Keep sparks or other sources of ignition away from batteries. Do not allow metallic contact between terminals of opposite polarity. Follow manufacturer's instructions for installation and service.

LEAD ACID BATTERY

Main constituents

Sulfuric acid: Corrosive causes severe burns. May attack many materials and clothing. Attacks many metals with liberation of hydrogen which is flammable and forms

Lead, lead alloys, lead sulfate, lead dioxide: Toxic when ingested.

Secondary constituents

Plastic components, rubber parts: Decomposition in a fire may produce toxic fumes

3. Composition/Information on Ingredients

MATERIAL	CAS - No	% by Weight	Exposure OSHA	Limits ACGIH
Lead/Lead Dioxide/Lead Sulfate	7439-92-1	60 - 78	0.05 mg/m ³	0.15 mg/m ³
Electrolyte (Sulfuric Acid)	7664-93-9	25 - 40*	1 mg/m ³	1 mg/m ³
Antimony	7440-36-0	1 - 6	0.5 mg/m ³	0.5 mg/m ³
Arsenic	7440-38-2	<1%	0,01 mg/m ³	0,01 mg/m ³

* % of acid in the electrolyte

4. First Aid Measures

4.1 Description of first aid measures

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). First aider needs to protect himself. Move out of dangerous area. Never give anything by mouth to an unconscious person. Take off contaminated clothing and shoes immediately.

If inhaled: Sulfuric Acid - Remove to fresh air immediately. If breathing is difficult, give oxygen. Consult physician. Lead Compounds - Remove from exposure, consult physician.

Skin contact: Sulfuric Acid - Flush with large amounts of water. Immediately remove contaminated clothing. Lead Compounds - are not readily absorbed through the skin. Wash with plenty of water. Remove contaminated clothing

Eye contact: Sulfuric Acid - rinse out immediately with plenty of water for at least 15 minutes with the eyelid held wide open, then consult physician. Lead Compounds - rinse out with plenty of water for at least 10 minutes with the eyelid held wide open. Summon eye specialist if necessary.

If Ingested: Sulfuric Acid - make victim drink large quantities of water; DO NOT induce vomiting (danger of perforation). Immediately call in physician. Do not attempt to neutralize. Lead Compounds - make victim drink plenty of water, induce vomiting. Immediately consult a physician.

If swallowed: Sulfuric Acid -rinse mouth with water (only if the person is conscious). Do not induce vomiting - give copious water to drink. Consult doctor immediately. Lead Compounds - make victim drink plenty of water, induce vomiting. Immediately consult a physician.

LEAD ACID BATTERY**4.2 Most important symptoms and effects, both acute and delayed**

Irritation and corrosion, Risk of blindness!

4.3 Indication of any immediate medical attention and special treatment needed

No data available.

5. Fire – Fighting Measures**5.1 Extinguishing media**

- *Suitable extinguishing media:* Dry chemical, carbon dioxide foam. Do not use water on live electrical circuits.
- *Unsuitable extinguishing media:* ---

5.2 Special hazards arising from the mixture

- *Specific hazards during firefighting* The product is non-combustible. If heated, corrosive vapours may be formed. Thermal decomposition or combustion may liberate carbon oxides and other hazardous gases or fumes.

5.3 Advice for firefighters

- **Special Fire Fighting Procedures & Protective Equipment:** Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells/containers due to the possibility of thermal shock causing cracking and electrolyte leaking. Avoid breathing vapors. Use full protective equipment (bunker gear) and self-contained breathing apparatus.
- **Further information:** Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. Accidental Release Measures**6.1 Personal precautions, protective equipment and emergency procedures:**

Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.

6.2 Environmental precautions:

Prevent spilled material from entering sewers and waterways.

6.3 Methods and material for containment and cleaning up:

Add neutralizer/absorbent to spill area. Sweep or shovel spilled material and absorbent and place in approved container.

Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.

6.4 Reference to other sections

Follow advices and protective measures mentioned in section 7 and 8.

LEAD ACID BATTERY

7. Handling and Storage

7.1 Precautions for safe handling

Keep away from flames during and immediately after charging. Combustion or overcharging may create or liberate toxic or hazardous gases and liquids.

Personal Precautions: Acid resistant aprons, boots and protective clothing. Safety glasses with side shields/face shield recommended. Ventilate enclosed areas.

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.

7.2 Conditions for safe storage, including any incompatibilities

Store batteries in cool, dry, well ventilated area. Do not short circuit battery terminals, or remove vent caps during storage or recharging. Protect battery from physical damage.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. Exposure controls/personal protection

8.1 Control parameters

Engineering Controls: Store and handle in a well ventilated area.

Work Practices: Make certain vent caps are on tightly. Follow all manufacturers' recommendations when stacking or palletizing. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Do not carry battery by terminals.

Personal Protective Equipment: None required during normal use.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.



Respiratory protection

If an overcharge or overheating condition exists (or when firefighting) and concentration of sulfuric acid are known or suspected to exceed the exposure limit, wear a self-contained breathing apparatus with a full face piece operated in a positive pressure mode.



Hand protection

Rubber or plastic acid resistant gloves with elbow length gauntlet.



Eye protection

Chemical goggles or safety glasses with side shields and a full face shield.

Other Special Clothing and Equipment: Acid resistant apron. Under severe exposure or emergency conditions, wear acid resistant clothing and boots.

LEAD ACID BATTERY

Work 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 an eyewash, fire extinguisher and emergency communication device in the work area

General safety and hygiene measures: Use only as directed.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

<i>Sulfuric Acid (electrolyte)</i>	Form	Liquid	
	Color	Colorless	
	Odor	Odourless	
	pH value	Strongly acid	
	Melting Point	-20 to -68 °C	
	Boiling Point	103 to 119 °C	
	Ignition Temperature	Not Available	
	Flash Point	Not Available	
	Explosion Limits	Upper Lower	Not Available
	Density (20 °C)		1,18 to 1,30 g/cm ³
Solubility in water (20 °C)		Soluble (CAUTION! DEVELOPMENT OF HEAT)	
<i>Lead/Lead alloys/ Lead compounds</i>	Form	Solid	
	Color	Metallic/brown/grey/white	
	Odor	None	
	Flammability	None	
	Melting Point	320 °C	
	Density (20 °C)		9.6 – 11.3 g/cm ³
	Reactivity		Lead dioxide/oxidizer
	Solubility in water (20 °C)		Insoluble

9.2 Other information

Other physical and chemical data have not been determined.

10. Stability and Reactivity

10.1 Reactivity

Stable under normal temperature conditions.

10.2 Chemical stability

The material is stable under normal conditions of use and storage. Store at room temperature.

LEAD ACID BATTERY**10.3 Possibility of hazardous reactions**

A risk of explosion and/or of toxic gas formation exists only for electrolyte (Sulfuric Acid) with the following substances:

Water, Alkali metals, alkali compounds, Ammonia, Aldehydes, acetonitrile, Alkaline earth metals, alkalines, Acids, alkaline earth compounds, Metals, metal alloys, Oxides of phosphorus, phosphorus, hydrides, halogen-halogen compounds, oxyhalogenic compounds, permanganates, nitrates, carbides, combustible substances, organic solvent, acetylidene, Nitriles, organic nitro compounds, anilines, Peroxides, picrates, nitrides, lithium silicide, iron(III) compounds, bromates, chlorates, Amines, perchlorates, hydrogen peroxide.

10.4 Conditions to avoid

Sparks and other sources of ignition. Prolonged overcharge and overheating.

10.5 Incompatible materials

Combination of sulfuric acid with combustibles and organic materials may cause fire and explosion. Also avoid strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur trioxide fumes and may release flammable hydrogen gas.

Lead Compound: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, carbides, sulfides, peroxides, phosphorus, sulfur, nascent hydrogen, and reducing agents.

10.6 Hazardous decomposition products

Sulfuric Acid: Hydrogen, sulfur dioxide, sulfur trioxide, hydrogen sulfide, and sulfuric acid mist.
Lead compounds: Temperatures above the melting point are likely to produce toxic metal fumes, vapor or contact with strong acid or base or the presence of nascent hydrogen may generate highly toxic gas.

11. Toxicological Information**11.1 Information on toxicological effects**

Acute toxicity:

Lead: In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates, and phosphates and precipitates out of the water column. Lead may occur as sorbed ions or surface coatings on sediment mineral particles or may be carried in colloidal particles in surface water. Most lead is strongly retained in soil, resulting in little mobility. Lead may be immobilized by ion exchange with hydrous oxides or clays or by chelation with humic or fulvic acids in the soil. Lead (when in the dissolved phase) is bioaccumulated by plants and animals, both aquatic and terrestrial.

Further toxicological information:

Lead: Due to the poor absorbability via the gastrointestinal tract, only very high doses lead to acute case of intoxication. After a latency period of several hours, metallic taste, nausea, vomiting and colics occur, in many instances followed by shock. Chronic uptake causes peripheral muscular weakness, anemia, and central-nervous disorders. Women of child-bearing age should not be exposed to the substance over longer periods of time (observe critical threshold).

Sulfuric Acid:

After inhalation of aerosol damage to the affected mucous membranes.

After skin contact severe burns with formation of scabs.

After eye contact burns corneal lesions.

After swallowing severe pain (risk of perforation), nausea, vomiting and diarrhoea.

After a latency period of several weeks possibly pyrolic stenosis

LEAD ACID BATTERY**12. Ecological Information****12.1 Toxicity**

Lead Compounds: Quantitative data on the toxicity are not available
Sulfuric Acid: LC50 (inhalation, rat): 510 mg/me/2h (calculated on the pure substance)
LD50 (oral, rat): 2140 mg/kg (Using 25% solution)
Specific symptoms in animal studies:
Eye irritation test (rabbit): burns
Skin irritation test (rabbit): burns
Toxicological values are not available due to other dangerous properties of the substance.

Sulfuric Acid: Biological Effects: harmful effect on aquatic organisms. Harmful effect due to pH shift. Toxic effect on fish and algae. Caustic even in diluted form. Does not cause biological oxygen deficit. Endangers drinking water supplies if allowed to enter soil and/or waters in large quantities. Neutralization possible in waste water treatment plants..

Subacute to chronic toxicity:

Lead Compounds: The risk of an embryo toxic effect must be considered probable. Pregnant women should not be exposed to the product.
Sulfuric Acid: No teratogenic effects in animal experiments

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

No data available.

12.6 Other adverse effects

None known.

Further hazardous properties cannot be excluded

Further ecological information:

The product should not be allowed to enter drains, water courses or the soil. If the product contaminates rivers and lakes or drains inform respective authorities.

13. Disposal considerations**13.1 Waste treatment methods**

Lead Acid Battery: Do not dispose as household waste. Follow local and National regulations to dispose. Return for recycling

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

Lead and lead compounds: Dispose as chemical compounds- do not pollute the environment

Disposal code according to the European Waste Catalogue:

Used product :16 06 01* lead batteries

LEAD ACID BATTERY**14. Transport information**

The product is subject to different provisions applicable in the different transport modes of dangerous goods governed by the relevant international regulations (ADR/RID, IMDG, ICAO/IATA).

ADR/RID

UN N°: UN2794

Classification: Class 8

Proper Shipping Name: BATTERIES, WET, FILLED WITH ACID electric storage

Packing Group ADR: not assigned

Label required: Corrosive

New batteries are exempt from all ADR/RID (special provision 598).

IMDG

UN No : 2794

Proper shipping name : BATTERY, WET, FILLED WITH ACID, electric storage

Class : 8

Packing group : III

EmS : F-A, S-B

Marine Pollutant : No

Label required : Corrosive

IATA

UN No : 2794

Proper shipping name : BATTERY, WET, FILLED WITH ACID, electric storage

Class : 8

Packing group : III

Marine Pollutant : No

Label required : Corrosive

Special precautions for user

See sections 6, 7 & 8

15. Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the mixture**

VOC (1999/13/EC): Not applicable

Seveso Directive (96/82/EC) : Directive 96/82/EC does not apply.

National legislation

Other regulations: Take note of Dir 94/33/EC on the protection of young people at work.

Further information: Reserved for industrial and professional use. Safety data sheet available for professional user on request.

15.2 Chemical safety assessment

For this mixture a chemical safety assessment has not been carried out.

LEAD ACID BATTERY**16. Other information****Full text of R-phrases referred to under sections 2 and 3**

- R35 Causes severe burns.
R36 Irritating to eyes.
R38 Irritating to skin.

Full text of H-Statements referred to under sections 2 and 3

- H314: Causes severe skin burns and eye damage.
H315: Causes skin irritation.
H319: Causes serious eye irritation.

Sources of key data used to compile the Safety Data Sheet

This Safety Data Sheet was elaborated on the basis of information provided by the manufacturer, as well as, suppliers of individual components and on the basis of data in publicly accessible databases.

Acronyms and abbreviations

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road (2011)

CAS No: Chemical Abstracts Service Number

EINECS No: European Inventory of Existing Commercial Chemical Substances Number

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

IATA-DGR: International Air Transport Association's-Dangerous Goods Regulations (52nd edition)

IMDG Code: International Maritime Dangerous Goods Code (35th amendment)

LOEL: Lowest-Observed-Effect Level

LOAEL: Lowest-Observed-Adverse-Effect

NOAEL: No Observed-Adverse-Effect Level

NOEL; No-Observed-Effect Level

RID: Regulations Concerning the International Transport of Dangerous Goods by Rail

According to Reach regulation (EC 1907/2006, Art31) batteries are articles with no intended release. As such, they are not covered by legal requirements to generate and supply an SDS or an MSDS. This Battery Information Sheet is provided solely as an information document for the purpose of assisting our customers.

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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