SAFETY DATA SHEET

1. IDENTIFICATION

1.1 Product Gel Lead Acid Battery

Trade name: EnergyCell OPzV
Industrial electrical storage batteries/cells all OPzV, PzV & PzVB types

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 Manufacturer

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"

Worldwide Corporate Offices

Headquarter Germany
Hansastrasse 8
D-91126 Schwabach
Tel: +49 9122 79889 0
Fax: +49 9122 79889 21
Mail: info@alpha-outback-energy.com

Eastern Europe
ee@alpha-outback-energy.com

France and Benelux
fbnl@alpha-outback-energy.com

Russia
russia@alpha-outback-energy.com

Middle East
me@alpha-outback-energy.com

Spain
spain@alpha-outback-energy.com

Africa
africa@alpha-outback-energy.com

For more information please visit **www.alpha-outback-energy.com**

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.
- 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 section15.

2.2 Other hazards

Adverse human health effects and symptoms:

	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

3. Composition/Information on Ingredients

Components	CAS No	[1]By Weight%	Chemical Symbol	Risk Phrases[2]
Metallic Lead	7439-92-1	30 - 40	Pb	R23 R25
Lead Monoxide	1317-36-8	< 1	PbO	R23 R24 R25
Lead Dioxide	1309-60-0	30 - 40	PbO_2	
Sulphuric Acid ([3]Battery Gel)	7664-93-9	10 - 20	H_2SO_4	R21 R22 R35 R36 R37 R38 R49
Silicon dioxide	7631-86-9	1 - 5	SiO_2	R36 R37 R38
[4]Plastic Parts	--	10 - 15	--	--

1) Contents may vary due to performance data of the Battery
2) Full text of R-phrases/ Hazard statements see SECTION 16
3) Density of the electrolyte varies in accordance to the state of charge and battery type
4) Composition of the plastic may vary due to different customer requirements

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, CO_2.
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.
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 Other	Approved acid mist/organic vapor respirator.
Protective Equipment	Acid resistant apron or clothes.
Note: Personal Protective Equipment advice is contained in Section 8 of the MSDS.	

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.
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. R-phrases: R35 causes severe chemical burns
Sulfuric Acid	231-639-5	7664-93-9	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

Item		Lead and lead compounds	Electrolyte
Appearance	***Form:***	Solid	Liquid
	Color:	Grey	Colorless
	Odor:	Odorless	
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/cm³
solubility in water :		Very low	Fully soluble*
Partition coefficient: n-octanol/water.		N/A	
Decomposition temperature.		N/A	

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.

* Gel electrolyte is not soluble.

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, CO_2 and Sulfur Oxides.

11. Toxicological Information

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
are ***Inhalation***	Under normal conditions of use, no health effects 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
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"
Proper shipping name:	
Class :	Excepted from the requirements because batteries have passed the Vibration and Pressure Differential performance tests for Non spillable designation.
Packing Group:	
Label:	

15. Regulatory information

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 Parliaent and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substancesin electrical and electronic equipment does not apply to batteries and accumulators used in electrical and electronic equipment."

16. Other information

Products such as Batteries are not in the scope of regulation which requires the publication of an EU Safety Data Sheet (91/155/EEC).

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. The contents and format of this MSDS are in accordance with EEC Commission Directive 1999/45/EC, 67/548/EC, 1272/2008/EC and EEC Commission Regulation 1907/2006/EC (REACH) Annex II.

This information is based on data considered to be accurate, however, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.

This information relates to the specific materials designated and may not be valid for such material used in combination with 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.

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.

Risk Phrases:	***Hazard statements***	
R21	H 312	Harmful in contact with skin
R22	H 302	Harmful if swallowed
R23	H 331	Toxic if inhaled.
R24	H 311	Toxic in contact with skin
R25	H 301	Toxic if swallowed
R35	H 314	Causes severe skin burns and eye damage.
R36	H 319	Causes serious eye irritation.
R37	H 335	May cause respiratory irritation.
R38	H 315	Causes skin irritation.
R49	H 350i	May cause cancer .