

Safety Data Sheet

Sun Station OPzV

Valve Regulated Lead-Acid Battery

SECTION I

Manufacturer's Name: Phaesun GmbH Brühlweg 9 87700 Memmingen Germany Telephone Number for Information: +49 8331 990 42 0 Emergency Telephone Number: +49 30 53001 0	Date: June 25, 2015
	Trade Name: Sealed Valve Regulated Non Spillable Lead-Acid Battery

SECTION II

HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components Specific Chemical Identity (Common Name (s))	Common Name	OSHA PEL	ACGIH TLV	Range Percent By Weight
Lead, CAS #7439921	Negative Electrode and	0.05 mg/m ³	0.15 mg/m ³	48-53% wt
Lead Oxide, CAS #1309600	Positive Electrode	0.05 mg/m ³	0.15 mg/m ³	23-26% wt
Lead Sulfate, CAS # 7446142	Positive and Negative	0.05 mg/m ³	0.15 mg/m ³	< 1% wt
Sulfuric Acid, CAS #7664939	Electrolyte	1.00 mg/m ³	1.00 mg/m ³	7-10% wt
Acrylonitrile Butadiene Styrene, CAS#9003569	Container and Lid	N/A	N/A	2-10%
Arsenic, CAS# 7440382	Grid	0.01 mg/m ³	0.01 mg/m ³	0-0.2%
Calcium, CAS#7440702	Grid	1.0 mg/m ³	1.0 mg/m ³	0-0.2%
Tin CAS #7440315	Grid	2.0 mg/m ³	2.0 mg/m ³	0-2.0%
Silicon Dioxide (Gel batteries) CAS #7631869	Gel	N/A	N/A	10%-20%

Percentages of components are dependant both on the model of the battery and stets of charge/discharge of the battery

Inorganic lead and electrolyte (sulfuric acid) are the primary components of every battery manufactured by Phaesun GmbH. Other ingredients may be present dependent upon battery type. Contact your Phaesun GmbH representative for additional information.

Phaesun GmbH Sealed Lead-Acid batteries are a sealed, non-spillable design. Under normal use and handling the customer has no contact with the internal components of the battery or the chemical hazards. Under normal use and handling these batteries do not emit regulated or hazardous substances. Warning: Battery terminals posts and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands thoroughly after working with batteries and before eating, drinking or smoking.

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Electrolyte (Sulfuric Acid):	
Appearance and Odor:	Clear, Odorless, colorless liquid
Solubility in Water:	100%
Boiling Point:	203 – 204°F (95.0-95.5°C)
Specific Gravity (H₂O=1):	1.230 – 1.280
Evaporation Rate (Butyl Acetate=1):	less than 1.0
Vapor Density (AIR=1):	greater than 1
Vapor Pressure (mm Hg):	10
Melting Point:	N/A

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used):	non flammable
Flammable Limits:	*Hydrogen Gas
Extinguishing Media:	Class ABC extinguisher,
Limits:	LEL = 4.1% (Hydrogen Gas) UEL = 74.2%

NOTE: CO₂ may be used, but not directly on the cell. The thermal shock may cause cracking of the battery case and/or cases.

Hydrogen gas may be generated during battery charging.

Special Fire Fighting Procedures: If batteries are on charge, turn off power. Use positive pressure, self-contained breathing apparatus in fighting fire. Water applied to electrolyte generates heat and causes it to splatter. Wear acid resistant clothing. Ventilate area well.

Unusual Fire and Explosion Hazards: Hydrogen and oxygen gases are generated in cells during normal battery operation or when on charge. (Hydrogen is flammable and oxygen supports combustion). These gases enter the air through the vent caps during battery overcharging. To avoid risk of fire or explosion, keep sparks and other sources of ignition away from the battery. Do not allow metal objects to simultaneously contact both positive and negative terminal of batteries. Ventilate area well.

SECTION V REACTIVITY DATA

Stability: Stable

Condition to Avoid: Prolonged overcharging, sources of ignition

Incompatibility (Materials to Avoid):

Sulfuric Acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, strong oxidizers and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas. Combination of Sulfuric acid with combustibles and organic materials may cause fire and explosion.

Avoid strong reducing agents, most metals, carbides, chlorates, nitrates and picrate.

Lead Compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.

Hazardous Decomposition Products: Sulfuric Acid: Excessive overcharging or fire may create sulfur trioxide, carbon monoxide, sulfuric acid mist and sulfur dioxide.

Lead Compounds: Contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

Hydrogen gas may be generated in an overcharged condition, in fire or at very high temperatures. CO, CO₂, and sulfur oxides may emit in fire. Hazardous polymerization will not occur.

SECTION VI HEALTH HAZARD DATA

Route(s) of Entry:

Sulfuric Acid: Harmful by all routes of entry.

Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume.

Inhalation:

Sulfuric Acid: 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:

Sulfuric Acid: 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 and must be treated by a physician.

Skin Contact:

Sulfuric Acid: Severe irritation, burns and ulceration.

Lead Compounds: Not absorbed through the skin.

Eye Contact:

Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.

Lead Components: May cause eye irritation.

Effects of Overexposure - Acute:

Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.

Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic:

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.

Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females.

Health Hazard Information (Acute and Chronic)

Sulfuric Acid:

The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within the battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may however result in the generation of sulfuric acid mist.

Lead Compounds:

Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Arsenic:

Listed by IARC as a carcinogen only after prolonged exposure at high levels.

Medical Conditions Generally Aggravated by Exposure:

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

Health Hazards (Acute and Chronic): Do not open battery, avoid contact with internal components. Internal components include lead and absorbed electrolyte. Electrolyte is corrosive and contact may cause skin irritation and chemical burns.

Emergency and First Aid Procedures:

Inhalation:

Sulfuric acid: Remove to fresh air immediately. If breathing is difficult, give oxygen.

Lead: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion:

Sulfuric acid: Give large quantities of water; do not induce vomiting; consult physician.

Lead: Consult physician immediately.

Skin:

Sulfuric acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.

Lead: Wash immediately with soap and water.

Eyes:

Sulfuric acid and lead: Flush immediately with large amounts of water for at least 15 minutes; consult physician.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released or spilled:

Electrolyte material is corrosive. Contains sulfuric acid. Neutralize any spilled material.

Comply with federal, state and local regulations on reporting releases, containing spills and reparation.

Contain spill to smallest possible area and absorb as appropriate. Avoid splashing and misting redemption.

General guideline:

Stop flow of material and contain/absorb small spills with dry sand, earth, and vermiculite absorption material.

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 not neutralized acid to sewer.

Waste Disposal Method: Lead-acid batteries are completely recyclable. For information on returning batteries Phaesun GmbH for recycling, contact your Phaesun GmbH Representative. Dispose of any collected material in accordance with local, state or applicable federal regulations.

Precautions to be taken in Handling and Storing: Store away from reactive material as defined in Section V, Reactivity Data. Place cardboard between layers of stacked batteries to avoid damage and short circuit. Do not allow metallic materials to simultaneously contact both terminals.

Other Precautions: If battery case is broken, avoid direct contact with internal components. Keep away from ignition sources during charging.

SECTION VIII CONTROL MEASURES

Respiratory Protection (Specific Type): N/A

Ventilation: Must be provided when charging in an enclosed area.

Protective Gloves: Recommended

Eye Protection: Recommended

Work Hygienic Practices: Good Personal hygiene and work practices are recommended.

Other Protection:

Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots.

Emergency Flushing:

In areas where sulfuric acid is handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

SECTION IX OTHER REGULATORY INFORMATION

Note: Sulfuric acid is water-reactive if concentrated.

European Inventory of Existing Commercial Chemical Substances (EINECS):

All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

For additional information concerning Phaesun GmbH products or questions concerning the content of this MSDS please contact your Phaesun GmbH representative.

This information is accurate to the best of BAE Batterien GmbH knowledge or obtained from sources believed by Phaesun GmbH to be accurate. Before using any product, read all warnings and directions on the label.

SECTION X REACTIVITY DATA AND STABILITY INFORMATION

Stability: Stable X Unstable ____

This product is stable under normal conditions at ambient temperature.

Conditions To Avoid: Prolonged overcharge; sources of ignition

Incompatibility: (Materials to avoid)

Sulfuric Acid: 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.

Arsenic compounds: strong oxidizers; bromine azide. NOTE: hydrogen gas can react with inorganic arsenic to form the highly toxic gas-arsine.

Hazardous Decomposition Products:

Sulfuric Acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen sulfide.

Lead Compounds: High temperatures 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

SECTION XI TOXICOLOGICAL INFORMATION

Routes of Entry:

- Sulfuric Acid: Harmful by all routes of entry.
- Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume. The presence of nascent hydrogen may generate highly toxic arsine gas.

Inhalation:

- Sulfuric Acid: 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:

- Sulfuric Acid: 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 and must be treated by a physician.

Skin Contact:

- Sulfuric Acid: Severe irritation, burns and ulceration.
- Lead Compounds: Not absorbed through the skin.
- Arsenic Compounds: Contact may cause dermatitis and skin hyper pigmentation.

Eye Contact:

- Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.
- Lead Components: May cause eye irritation.

Effects of Overexposure - Acute:

- Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.
- Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic:

- Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.
- Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50mcg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Carcinogenicity:

- Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Group 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.
- Lead Compounds: Lead is listed as a Group 2A carcinogen, likely in animals at extreme doses. Per the guidance found in OSHA 29 CFR 1910.1200 Appendix F, this is approximately equivalent to GHS Category 1B. Proof of carcinogenicity in humans is lacking at present.
- Arsenic: Arsenic is listed by IARC as a Group 1 - carcinogenic to humans. Per the guidance found in OSHA 29 CFR 1910.1200 Appendix F, this is approximately equivalent to GHS Category 1A.

SECTION XII ECOLOGICAL INFORMATION

Environmental Risk Phrase: R58 – May cause long term adverse effects in the environment

The following information is of relevance if the sealed lead acid battery is /damaged broken and the ingredients are released to environment.

- Electrolyte (diluted sulphuric acid) In order to avoid damage to the sewage system, the acid has to be neutralized by means of lime 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.
- 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. The former classification of Lead compounds as toxic for the aquatic environment R50/53 had been triggered from test results generated in the 80's for soluble Lead compounds (Lead Acetate). The hardly soluble Lead compounds such as Battery Lead Oxide were not tested at this time. Tests on Battery Lead Oxide were carried out in 2001 and 2005. The respective test results conclude that Battery Lead Oxide is not toxic for the environment, neither R50 nor R50/53 nor R51/53. From this it follows that the general classification for Lead compounds (R50/53) does not apply to Battery Lead Oxide. As the result of this the Risk Phrase R52/53 (Harmful to aquatic organisms, may cause longterm adverse effects in the aquatic environment) applies to Battery Lead Oxide.
- Effects of Battery Lead Oxide in the aquatic environment:
 - Toxicity for fish: 96 h LC 50 > 100 mg/l
 - Toxicity for daphnia: 48 h EC 50 > 100 mg/l
 - Toxicity for alga: 72 h IC 50 > 10 mg/l
- The results demonstrate these Battery Lead Oxide compounds in a concentration of 100 mg/l have no adverse effect on fish and daphnia. A concentration of these Battery Lead Oxide of 10 mg/l has no adverse effect on the rate of growth and the biomass. For the classification according to Directive 67/548/EEC the most sensitive adverse effect has to be considered. As a result of the toxicity for alga at > 10 mg/l Battery Lead Oxide has to be classified according to the R-Phrases 52/53 (Harmful to aquatic organisms, may cause long term adverse effects in the aquatic environment).

SECTION XIII DISPOSAL CONSIDERATION INFORMATION

Spent lead-acid batteries (EWC 160601) are subject to regulation of the EU Battery Directive (DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators) and its adoptions into national legislation on the composition and end of life management of batteries. Spent Lead-Acid batteries are recycled in lead refineries (secondary lead smelters). The components of a spent Lead-Acid battery are recycled or reprocessed. At the points of sale, the manufacturers and importers of batteries, respectively the metal dealers take back spent batteries, and render them to the secondary lead smelters for processing. To simplify the collection and recycling or reprocessing process spent Lead-Acid batteries must not be mixed with other batteries. By no means may the electrolyte (diluted sulphuric acid) be emptied in an inexperienced manner. This process is to be carried out by the processing companies only.

SECTION XIV TRANSPORT INFORMATION

Land transportation according to ADR/RID

Proper shipping name: Batteries, wet, non-spillable
ADR/RID-class: 8
UN-number: 2800
Hazard label: 8
Packing group: none
Packing Instruction: P 003
Special Provision: 238 para. a) + b): no transport as dangerous goods (non-spillable batteries are not subject to other requirements of ADR/RID if they meet the requirements according to special provision 238. An appropriate manufacturer`s confirmation is necessary. Batteries which do not meet the requirements according to Special Provision 238 have to be packed and carried as listed in 14.1 Land transportation ADR/RID according to Special Provision 598.)

Sea transportation according to IMDG Code

Proper shipping name: Batteries, wet, non-spillable
ADR/RID-class: 8
UN-number: 2800
Hazard label: 8
Packing group: none
Packing Instruction: P 003 and PP 16
EmS: F-A, S-B
Special Provision: 238 no. 1 + 2: no transport as dangerous goods (non-spillable batteries are not subject to other requirements of IMDG Code if they meet the requirements according to Special Provision 238. An appropriate manufacturer`s confirmation is necessary. Batteries which do not meet the requirements according to Special Provision 238 have to be packed as listed in 14.1 Sea transportation IMDG Code according to Packaging Instruction P 801 and carried as dangerous goods according to UN 2794.)

Air transportation according to IATA DGR

Proper shipping name: Batteries, wet, non-spillable
ADR/RID-class: 8
UN-number: 2800
Hazard label: 8
Packing group: none
Packing Instruction: P 003 and PP 16
EmS: F-A, S-B
Special Provision: 238 no. 1 + 2: no transport as dangerous goods (non-spillable batteries are not subject to other requirements of IMDG Code if they meet the requirements according to Special Provision 238. An appropriate manufacturer`s confirmation is necessary. Batteries which do not meet the requirements according to Special Provision 238 have to be packed as listed in 14.1 Sea transportation IMDG Code according to Packaging Instruction P 801 and carried as dangerous goods according to UN 2794.)

SECTION XV REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

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. If applicable; EPA hazardous waste number D002 (corrosively) and D008 (lead).

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. Batteries also contain other chemicals known to State of California to cause cancer. Wash hands after handling.**

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 II 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 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 40 CFR's 372.25, 372.27, or 372.28 or determining the amount of release to be reported under 40 CFR 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.

SECTION XV - CONTINUED REGULATORY INFORMATION

The reporting of lead and sulfuric acid (and their releases) in lead-acid batteries used in cars, trucks, most cranes, forklifts, locomotive engines, and aircraft for the purposes of EPCRA Section 313 is not required. Lead-acid batteries used for these purposes are exempt for Section 313 reporting per the "Motor Vehicle Exemption." See page B-22 of the [U.S. EPA Guidance Document for Lead and Lead Compound Reporting under EPCRA Section 313](#) for additional information of this exemption.

Always check your state/local requirements as they may differ.

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	54-62 % wt.
Electrolyte (Sulfuric Acid/Water Solution)	7664-93-9	26-40 % wt.
Antimony	7440-36-0	1.6-2.7 %
Arsenic	7440-38-2	0-0.2% wt.

See 40 CFR Part 370 for more details.

Additional Information

This product may be subject to Restriction of Hazardous Substances (RoHS) regulations in Europe and China, or may be regulated under additional regulations and laws not identified above, such as for uses other than described or as- designed/as-intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION XVI OTHER INFORMATION

NFPA Hazard Rating for Sulfuric acid:

Flammability (Red) = 0

Health (Blue) = 3

Reactivity (Yellow) = 2

Sulfuric acid is water-reactive if concentrated.

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.