

# Safety Data Sheet

## Wet/vented/flooded Lead Acid Battery

SECTION I PRODUCT IDENTIFICATION	
<b>Manufacturer's Name:</b> Phaesun GmbH Brühlweg 9 87700 Memmingen Germany	<b>Trade Name/ Chemical Trade Name (as used on label):</b> Lead Acid Battery, Wet  <b>Synonyms:</b> Industrial/Stationary Battery  <b>Chemical Family/Classification:</b> Electric Storage Battery

SECTION II GHS HAZARDOUS INGREDIENTS/IDENTITY INFORMATION		
HEALTH	ENVIRONMENTAL	PHYSICAL
<b>Acute Toxicity</b>  (Oral/Dermal/Inhalation) Category 4 Skin Corrosion/Irritation Category 1A Eye Damage Category 1 Reproductive Category 1A Carcinogenicity (lead compounds) Category 1B Carcinogenicity (arsenic) Category 1A Carcinogenicity (acid mist) Category 1A Specific Target Organ Category 2 Toxicity (repeated exposure)	Aquatic Chronic 1  Aquatic Acute 1	Explosive Chemical, Division 1.3

GHS LABEL		
HEALTH	ENVIRONMENTAL	PHYSICAL
  		

<p><b>Hazard Statements:</b>  <b>DANGER!</b>  Causes severe skin burns and eye damage.  Causes serious eye damage.  May damage fertility or the unborn child if ingested or inhaled.  May cause cancer if ingested or inhaled.  Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure.  May form explosive air/gas mixture during charging.  Extremely flammable gas (hydrogen).  Explosive, fire, blast or projection hazard.</p>	<p><b>Precautionary Statements:</b>  Wash thoroughly after handling.  Do not eat, drink or smoke when using this product.  Wear protective gloves/protective clothing, eye protection/face protection.  Avoid breathing dust/fume/gas/mist/vapors/spray.  Use only outdoors or in a well-ventilated area.  Causes skin irritation, serious eye damage.  Contact with internal components may cause irritation or severe burns.  Avoid contact with internal acid.  Irritating to eyes, respiratory system, and skin.</p>
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### SECTION III HAZARDOUS INGREDIENTS/IDENTIFY INFORMATION/COMPOSITION

Hazardous Components Specific Chemical Identity	Common Name	CAS Number	OSHA PEL	ACGIH TLV	Range Percent By Weight
Lead	Negative Electrode and Grid	7439-92-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	48-53% wt
Lead Oxide	Positive Electrode	1309-60-0	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	23-26% wt
Lead Sulfate	Positive and Negative Electrode	7446-14-2	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	< 1% wt
Sulfuric Acid	Electrolyte	7664-93-9	1.00 mg/m <sup>3</sup>	1.00 mg/m <sup>3</sup>	7-10% wt
Acrylonitrile Butadiene Styrene	Container and Lid	9003-56-9	N/A	N/A	2-10%
Arsenic	Grid	7440-38-2	0.01 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0-0.2%
Antimony	Positive Electrode and Negative Electrode	7440-36-0	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>	1.6-2.7 % wt.
Styrene Acrylonitrile	Container and Lid	9003-54-7	N/A	N/A	2-10%
Polyethylene	Separator	9002-88-4	N/A	N/A	1-2.0%

Percentages of components are dependent both on the model of the battery and number of charges/discharges 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.

**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 IV FIRST AID MEASURES

### **Inhalation:**

Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen. Consult a physician.

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

### **Ingestion:**

Sulfuric Acid: Give large quantities of water; do not induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death; consult a 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. If symptoms persist, seek medical attention. Wash contaminated clothing before reuse. Discard contaminated 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 while lifting lids.

Seek immediate medical attention if eyes have been exposed directly to acid.

## SECTION V FIRE AND EXPLOSION HAZARD DATA/FIRE FIGHTING MEASURES

**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:** CO<sub>2</sub> may be used, but not directly on the cell. The thermal shock may cause cracking of the battery case and/or cases.

**WARNING:** 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 can generate heat and causes it to splatter. Wear acid resistant clothing. Ventilate area well.

Note: Strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Unusual Fire and Explosion Hazards: Hydrogen and oxygen gases are generated in the 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 VI PRECAUTIONS FOR SAFE HANDLING AND USE/ACCIDENTAL RELEASE

### 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 VII HANDLING AND STORAGE

### Handling:

Unless involved in recycling operations, do not breach the casing or empty the contents of the battery. Handle carefully and avoid tipping, which may allow electrolyte leakage. There may be increasing risk of electric shock from strings of connected batteries.

Keep containers tightly closed when not in use. If battery case is broken, avoid contact with internal components.

Keep vent caps on and cover terminals to prevent short circuits. Place cardboard between layers of stacked automotive batteries to avoid damage and short circuits. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water. Use banding or stretch wrap to secure items for shipping.

Prevent static discharges.

### Storage:

Store batteries in cool, dry, well-ventilated areas with impervious surfaces and adequate containment in the event of spills. Batteries should also be stored under roof for protection against adverse weather conditions. Separate from incompatible materials. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat. Keep away from metallic objects could bridge the terminals on a battery and create a dangerous short-circuit.

### Charging:

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

## SECTION VIII EXPLOSURE CONTROLS/PERSONAL PROTECTION

**Respiratory Protection (NIOSH/MSHA approved):**

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection

**Ventilation:**

Must be provided when charging in an enclosed area.

**Protective Gloves/Skin Protection:**

Strongly recommended

**Eye Protection:**

Strongly recommended at all times. Further, the use of a Face shield is recommended when adding water or electrolyte to batteries.

**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 PHYSICAL AND CHEMICAL PROPERTIES

**Electrolyte (Sulfuric Acid):**

<b>Appearance and Odor:</b>	Clear, Odorless, colorless liquid
<b>Solubility in Water:</b>	100%
<b>Boiling Point:</b>	203 – 204°F (95.0-95.5°C)
<b>Specific Gravity (H<sub>2</sub>O=1):</b>	1.230 – 1.280
<b>Evaporation Rate (Butyl Acetate=1):</b>	less than 1.0
<b>Vapor Density (AIR=1):</b>	greater than 1
<b>Vapor Pressure (mm Hg):</b>	10
<b>Melting Point:</b>	N/A

## 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 long-term 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 batteries:**

Send to secondary lead smelter for recycling. Spent lead-acid batteries are not regulated as hazardous waste when the requirements of 40 CFR Section 266.80 are met. This should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.

### **Electrolyte:**

Place neutralized slurry into sealed containers and handle as applicable with state and federal regulations. Large water-diluted spills, after neutralization and testing, should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

## SECTION XIV TRANSPORT INFORMATION

### **GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:**

Proper Shipping Name Batteries, Wet, Filled with Acid

Hazard Class 8 ID Number UN2794

Packing Group III Labels Corrosive

### **AIRCRAFT – ICAO-IATA:**

Proper Shipping Name Batteries, Wet, Filled with Acid

Hazard Class 8 ID Number UN2794

Packing Group III Labels Corrosive

Reference IATA packing instructions 870

### **VESSEL – IMO-IMDG:**

Proper Shipping Name Batteries, Wet, Filled with Acid

Hazard Class 8 ID Number UN2794

Packing Group III Labels Corrosive

Reference IMDG packing instructions P801

### **Additional Information**

Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable, origin/destination/customs points as-shipped.

## 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	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.