

# Victron Energy OPzS Battery, wet, filled with acid

## MATERIAL SAFETY DATA SHEET

### SECTION 1 - GENERAL INFORMATION

MANUFACTURER'S NAME: Victron Energy B.V	EMERGENCY TELEPHONE NO.: +31-36-5359700
ADDRESS: De Paal 35 1351 JG Almere-Haven The Netherlands	OTHER INFORMATION CALLS: +31-36-5359700
<b>Chemical / Trade Name (as used on label):</b> Lead-Acid Battery	<b>Chemical Family / Classification:</b> Electric Storage Battery
PERSON RESPONSIBLE FOR PREPARATION Reinout Vader, Managing Director	Revised date: November 14 <sup>th</sup> , 2017

### SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS Number	% Weight	OSHA	ACGIH	NIOSH
<b>Inorganic compounds:</b>					
Lead	7439-92-1	90-95	50	150	100
Calcium	7440-70-2	0.02	--	--	--
Tin	7440-31-5	0.06	2000	2000	--
Antimony	7440-36-0	1-6	500	500	1000
Arsenic	7440-38-2	<1	500	500	--
Copper	7440-50-8	<1	1000	1000	--
<b>Electrolyte (sulfuric acid)</b>	7664-93-9	20-44	1000	1000	1000

#### NON-HAZARDOUS INGREDIENTS

Polyester  
Polyethylene  
Styrenacrylnitril (SAN) cell container

### SECTION 3 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling point (electrolyte): 95-115°C (203-240°F)	Vapor pressure (electrolyte): 10 mm Hg	Specific gravity (electrolyte): 1.215 – 1350	Melting point: > 160°C (320°F) (styrenacrylnitril (SAN) cell container)
Percent Volatile By Volume: not Applicable	Vapor Density: Hydrogen: 0.069 (Air =1) Electrolyte: 3.4 @ STP (Air =1)	Evaporation rate: less than 1 (Butyl Acetate = 1)	
Solubility in water: 100% soluble (electrolyte)			
Appearance and Odor: Battery: styrenacrylnitril (SAN) cell container, solid; may be contained within an outer casing of aluminum or steel. Case has metal terminals. Lead: gray, metallic, solid; brown/grey oxide. Electrolyte: clear liquid with a sharp, penetrating, pungent odor.			

### SECTION 4 - HAZARD IDENTIFICATION

Signs and symptoms of exposure	1. Acute hazards	Do not open battery. Avoid contact with internal components. Internal components include lead and electrolyte (sulfuric acid). <b>Electrolyte</b> - Electrolyte is corrosive and contact may cause skin irritation and chemical burns. Electrolyte causes severe irritation and burns of eyes, nose and throat. Ingestion can cause severe burns and vomiting. <b>Lead</b> - Direct skin or eye contact may cause local irritation. Inhalation or ingestion of lead dust or fumes may result in headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia and leg, arm and joint pain.			
	2. Sub-chronic and chronic health effects	<b>Electrolyte</b> - Repeated contact with electrolyte causes irritation and skin burns. Repeated exposure to mist may cause erosion of teeth, chronic eye irritation and/or chronic inflammation of the nose, throat and lungs. <b>Lead</b> - Prolonged exposure may cause central nervous system damage, gastrointestinal disturbances, anemia, irritability, metallic taste, insomnia, wrist-drop, kidney dysfunction and reproductive system disturbances. Pregnant women should be protected from excessive exposure to prevent lead from crossing the placental barrier and causing infant neurological disorders. California Proposition 65 <b>Warning:</b> Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm, and during charging, strong inorganic acid mists containing sulfuric acid are evolved, a chemical Known to the State of California to cause cancer. Wash hands after handling.			
Medical conditions generally aggravated by exposure	Contact with internal components if battery is broken or opened, then persons with the following medical conditions must take precautions: pulmonary edema, bronchitis, emphysema, dental erosion and tracheobronchitis.				
Routes of entry	Inhalation - YES Ingestion - YES	Eye Contact- YES			
Chemical(s) listed as carcinogen or potential carcinogen	Proposition 65 - YES	National Toxicology Program - YES	I.A.R.C. Monographs - YES	O.S.H.A. - NO	

## SECTION 5 - FIRST AID MEASURES

<b>Routes of Entry: Lead compounds</b>	<b>Hazardous exposure can occur only when product is heated above the melting point, oxidized, or otherwise processed or damaged to create dust, vapor, or fume.</b>
1. Inhalation	Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs. Remove from exposure, gargle, wash nose and lips; consult physician.
2. Ingestion	Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. This may lead rapidly to systemic toxicity. Consult physician immediately.
3. Skin contact	Not absorbed through the skin. Wash with soap and water.
4. Eye contact	May cause eye irritation.
5. Effects of overexposure – acute	Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances, and irritability.
6. Effects of overexposure – chronic:	Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in both males and females.
7. Carcinogenicity	Listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.
8. Medical conditions generally aggravated by exposure	Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

<b>Routes of Entry: Electrolyte (sulfuric acid)</b>	<b>Harmful by all routes of entry</b>
1. Inhalation	Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation. Remove to fresh air immediately. If breathing is difficult: give oxygen.
2. Ingestion	May cause severe irritation of mouth, throat, esophagus and stomach. Give large quantities of water; do not induce vomiting; consult physician.
3. Skin contact	Severe irritation, burns and ulceration. Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.
4. Eye contact	Severe irritation, burns, cornea damage, and blindness. Flush immediately with large amounts of water for at least 15 minutes; consult physician.
5. Effects of overexposure – acute	Severe skin irritation, cornea damage, upper respiratory irritation.
6. Effects of overexposure – chronic:	Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.
7. Carcinogenicity	The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I 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.
8. 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.

## SECTION 6 - FIREFIGHTING MEASURES

Flash point: not applicable	Flammable limits in air % by volume: LEL = 4.1% (hydrogen gas) UEL = 74.2%	Extinguishing Media: CO2, foam, dry chemical	Auto-Ignition temperature: 500°C (900°F) (styrenacrylonitril)
Special firefighting procedures	Lead/acid batteries do not burn, or burn with difficulty. Do not use water on fires where molten metal is present. Extinguish fire with agent suitable for surrounding combustible materials. Cool exterior of battery if exposed to fire to prevent rupture. The acid mist and vapors generated by heat or fire are corrosive. Use NIOSH approved self-contained breathing apparatus (SCBA) and full protective equipment operated in positive-pressure mode.		
Unusual fire and explosion hazards	Highly flammable hydrogen gas is generated during charging and operation of OPzS batteries. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic materials to simultaneously contact negative and positive terminals of cells and batteries. Follow manufacturer's instructions for installation and service.		

## SECTION 7 - ACCIDENTAL RELEASE MEASURES

Procedures for cleanup	Avoid contact with any spilled material. Contain spill, isolate hazard area, and deny entry. Limit site access to emergency responders. Neutralize spilled electrolyte with sodium bicarbonate, soda ash, lime or other neutralizing agent. Place battery in suitable container for disposal. Dispose of contaminated material in accordance with applicable local, state and federal regulations. Sodium bicarbonate, soda ash, sand, lime or other neutralizing agent should be kept on-site for spill remediation.
Personal precautions	Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side shields/face shield recommended.
Environmental precautions	Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side shields/face shield recommended.

## SECTION 8 - HANDLING AND STORAGE

Precautions to be taken in handling and storage	Store away from reactive materials, open flames and sources of ignition as defined in Section 9 – Stability and Reactivity Data. Store batteries in cool, dry, well-ventilated areas. Batteries should be stored under roof for protection against adverse weather conditions. Avoid damage to containers.
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 and smoking. Work clothes and equipment should remain in designated lead contaminated areas, and never taken home or laundered with personal clothing. Wash soiled clothing, work clothes and equipment before reuse.
Respiratory protection	None required under normal conditions.
Protective gloves	Wear rubber or plastic acid resistant gloves.
Eye protection	ANSI approved safety glasses with side shields/face shield recommended.
Other protective clothing or equipment	Safety shower and eyewash.

## SECTION 9 - STABILITY AND REACTIVITY

Stability	Stable
Conditions to avoid	Prolonged overcharge; sources of ignition
Incompatibility (materials to avoid)	<u>Sulfuric acid</u> : 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. <u>Lead compounds</u> : Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.
Hazardous decomposition products	<u>Sulfuric acid</u> : Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen. <u>Lead compounds</u> : 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	Hazardous polymerization has not been reported.

## SECTION 10 - ECOLOGICAL INFORMATION

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 (dissolved phase) is bioaccumulated by plants and animals, both aquatic and terrestrial.

## SECTION 11 - DISPOSAL CONSIDERATIONS

Lead-acid batteries are completely recyclable. Return whole scrap batteries to distributor, manufacturer or lead smelter for recycling. For information on returning batteries to Victron Energy for recycling call +31-36-5359700. For neutralized spills, place residue in acid-resistant containers with sorbent material, sand or earth and dispose of in accordance with local, state and federal regulations for acid and lead compounds. Contact local and/or state environmental officials regarding disposal information.

## SECTION 12 – TRANSPORT INFORMATION

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

Proper shipping name:	Batteries, wet, filled with acid	ID Number:	UN2794
Hazard class	8	Labels:	Corrosive
Packing Group	III		

### AIRCRAFT – ICAO-IATA:

Proper shipping name:	Batteries, wet, filled with acid	ID Number:	UN2794
Hazard class	8	Labels:	Corrosive
Packing Group	III		

Reference IATA packing instructions 870

### VESSEL – IMO-IMDG:

Proper shipping name:	Batteries, wet, filled with acid	ID Number:	UN2794
Hazard class	8	Labels:	Corrosive
Packing Group	III		

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 13 – REGULATORY INFORMATION

U.S. HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD:	LEAD – YES ARSENIC – YES SULFURIC ACID – YES
INGREDIENTS LISTED ON TSCA INVENTORY:	YES
CERCLA SECTION 304 HAZARDOUS SUBSTANCES:	LEAD – YES ARSENIC – YES SULFURIC ACID – YES
	RQ: N/A* RQ: 1 POUND RQ: 1000 POUNDS

\* RQ: REPORTING NOT REQUIRED WHEN DIAMETER OF THE PIECES OF SOLID METAL RELEASED IS EQUAL TO OR EXCEEDS 100 µm (micrometers).

EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE: SULFURIC ACID – YES

EPCRA SECTION 313 TOXIC RELEASE INVENTORY: LEAD – CAS NO: 7439-92-1  
ARSENIC – CAS NO: 7440-38-2  
SULFURIC ACID – CAS NO: 7664-93-9

## SECTION 14 – OTHER INFORMATION

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, VICTRON BATTERY MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES. ALTHOUGH REASONABLE PRECAUTIONS HAVE BEEN TAKEN IN THE PREPARATION OF THE DATA CONTAINED HEREIN, IT IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THIS MATERIAL SAFETY DATA SHEET PROVIDES GUIDELINES FOR THE SAFE HANDLING AND USE OF THIS PRODUCT; IT DOES NOT AND CANNOT ADVISE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.