Victron Energy VRLA Battery
MATERIAL SAFETY DATA SHEET

Issue date: 22-03-2020

SECTION 1 - GENERAL INFORMATION

MANUFACTURER: Victron Energy B.V.	EMERGENCY TELEPHONE NO.: +31-36-5359700
ADDRESS: De Paal 35 1351 JG Almere, The Netherlands	OTHER INFORMATION CALLS: +31-36-5359700
Chemical / Trade Name (as used on label) Lead-Acid Battery	**Chemical Family / Classification** Electric Storage Battery

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

C.A.S.	PRINCIPAL HAZARDOUS COMPONENT(S) (chemical & common name(s)	Hazard Category	% Weight	ACGIH TLV - mg/m3	OSHA PEL/TWA - mg/m3
7439-92-1	Lead/Lead Oxide/Lead Sulfate	Acute-Chronic	60-70	0.05 mg/m3	0.05 mg/m3
7440-70-2	Calcium (lead calcium alloy)	Reactive	<0.1	Not Established	Not Established
7440-31-5	Tin	Chronic	<0,5	2	2
7440-38-2	Arsenic (inorganic)	Acute-Chronic	<1	0.01	0.01
7664-93-9	Sulfuric Acid (Battery Electrolyte)	Reactive-Oxidizer Acute -Chronic	10-30	1.0	1.0
Not pplicable	Inert Ingredients	Not applicable	<6	Not Applicable	Not Applicable

COMMON NAME (Used on label): Valve Regulated Lead-Acid Battery
(Trade Name & Synonyms) VRLA, Recombinant lead acid: AGM Deep Cycle, AGM Super Cycle, GEL Deep cycle, AGM Telecommunications, GEL OPzV tubular plate
Chemical Family: Toxic and Corrosive Material Mixture
Chemical Name: Battery, Storage, Lead Acid, Valve Regulated

SECTION 3 -- HAZARD IDENTIFICATION

Signs and Symptoms of Exposure	1. Acute Hazards	Do not open battery. Avoid contact with internal components. Internal components include lead and absorbed electrolyte. Electrolyte - 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. Lead - 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	Electrolyte - 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. Lead - 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 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, 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 4 - FIRST AID MEASURES

Emergency and First Aid Procedures	Contact with internal components if battery is opened/broken.
1. Inhalation	Move to fresh air and provide medical oxygen/CPR if needed. Obtain medical attention.
2. Eyes	Immediately flush with water for at least 15 minutes, hold eyelids open. Obtain medical attention.
3. Skin	Flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary.
4. Ingestion	Do not induce vomiting. If conscious drink large amounts of water/milk. Obtain medical attention. Never give anything by mouth to an unconscious person.

SECTION 5 - FIREFIGHTING MEASURES

Flash Point – Not Applicable	Flammable Limits in Air % by Volume: Not Applicable	Extinguishing Media – Class ABC, Co2, Halon	Auto-Ignition 675°F (polypropylene) Temperature
Special Fire Fighting 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	Sulfuric acid vapors are generated upon overcharge and polypropylene case failure. Use adequate ventilation. Avoid open flames/sparks/other sources of ignition near battery.		

SECTION 6 - 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: Lead and its compounds and sulfuric acid can pose a severe threat to the environment. Contamination of water, soil and air should be prevented.

SECTION 7 - 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 10 – 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 landered with personal clothing. Wash soiled clothing, work clothes and equipment before reuse.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection	None required under normal conditions. Acid/gas NIOSH approved respirator is required when the PEL is exceeded or employee experiences respiratory irritation.
Ventilation	Store and handle in dry ventilated area.
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 - PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not Applicable	Vapor Pressure: Not Applicable	Specific Gravity: 1.250 – 1320 pH<2	Melting Point: >320°F (polypropylene)
Percent Volatile By Volume: Not Applicable	Vapor Density: Hydrogen: 0.069 (Air =1) Electrolyte: 3.4 @ STP (Air =1)		Evaporation Rate: Not applicable
Solubility in water: 100% soluble (electrolyte)		Reactivity in Water: Electrolyte – Water Reactive (1)	
Appearance and Odor:	Battery: co-polymer polypropylene, solid; may be contained within an outer casing of aluminum or steel. Case has metal terminals. Lead: Gray, metalic, solid; brown/grey oxide Electrolyte: Odorless, liquid absorbed in glass mat material or GEL No apparent odor.		

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable	Conditions to Avoid: Avoid overcharging and smoking, or sparks near battery surface. High temperatures-cases decompose at >320°F.
Incompatibility	Sparks, open flames, keep battery away from strong oxidizers.
Hazardous Decomposition Products	Combustion can produce carbon dioxide and carbon monoxide.
Hazardous Polymerization	Hazardous Polymerization has not been reported.

SECTION 11 - TOXICOLOGICAL INFORMATION

GENERAL: The primary routes of exposure to lead are ingestion or inhalation of dust and fumes.

ACUTE:
INHALATION/INGESTION: Exposure to lead and its compounds may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, and pain in the legs, arms and joints. Kidney damage, as well as anemia, can occur from acute exposure.

CHRONIC:
INHALATION/INGESTION: Prolonged exposure to lead and its compounds may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia, and wrist drop. Symptoms of central nervous system damage include fatigue, headaches, tremors, hypertension, hallucination, convulsions and delirium. Kidney dysfunction and possible injury has also been associated with chronic lead poisoning. Chronic over-exposure to lead has been implicated as a causative agent for the impairment of male and female reproductive capacity, but there is at present, no substantiation of the implication. Pregnant women should be protected from excessive exposure. Lead can cross the placental barrier and unborn children may suffer neurological damage or developmental problems due to excessive lead exposure in pregnant women.

SECTION 12 - 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 13 - 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 14 – TRANSPORT INFORMATION

All Victron AGM Deep Cycle, AGM Super Cycle, AGM Telecommunications, GEL Deep Cycle and GEL OPzV tubular plate 2V cell batteries are valve regulated lead acid (VRLA) batteries.
Victron's VRLA batteries have passed vibration, pressure differential and free flowing acid tests under 49 CFR173.159a, meet IATA Special Provisions A48, A67, A164 & A183, and IMDG Special Provisions 238.1 & 238.2.
The batteries are securely packaged, protected from short circuits and labeled "Non-Spillable".
Victron's VRLA batteries are exempt from DOT Hazardous Material Regulations, IATA Dangerous Goods Regulations, and IMDG Code.

US DOT
Excepted from the requirements because batteries have passed the vibration and pressure differential performance tests, and ruptured case test for non-spillable designation.

IMO
Excepted from the requirements because batteries have passed the vibration and pressure differential performance tests, and ruptured case test for non-spillable designation.
And, when packaged for transport, the terminals are protected from short circuit.

IATA
Excepted from the requirements because batteries have passed the vibration and pressure differential performance tests, and ruptured case test for non-spillable designation.
And, when packaged for transport, the terminals are protected from short circuit.

SECTION 15 – 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 DIAMTER 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 16 – OTHER INFORMATION

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, VICTRON ENERGYY 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. ALTHOUG 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 ADVICE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.