Victron Energy Battery
MATERIAL SAFETY DATA SHEET
Lithium SuperPack 12,8V/20Ah, 60Ah, 100Ah, 200Ah, 25,6V/50Ah

SECTION 1 - GENERAL INFORMATION

MANUFACTURER'S NAME: Victron Energy B.V	EMERGENCY TELEPHONE NO.: +31-36-5359700
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PERSON RESPONSIBLE FOR PREPARATION Reinout Vader, Managing Director	Revised Date: March 25th, 2022

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	Weight %	Cas No.	EC No.
Phosphate	26%	-	-
PVDF	1,5%	24937-79-9	-
Graphite	13%	7782-42-5	231-955-3
CMC	0,2%	9000-11-7	-
Al	6%	7429-90-5	231-072-3
Cu	10%	7440-50-8	231-159-6
PP separator	2,1%	-	-
Steel	20%	-	-
Electrolyte	16%	-	-
PVC heat shrinking film	0,03%	-	-
PP sealing ring	0,05%	-	-

COMMON NAME: (Used on label) Lithium-ion Battery

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. A shorted lithium battery can cause thermal and chemical burns upon contact with the skin. May be a reproductive hazard.		
	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.		
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	Remove 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

1.	Extinguishing media: spray the battery with water or put the smoking /fire battery into water at once in case of battery fume or fire.
2.	Extinguishing tools : Type D extinguishers , Co2, Dry chemical or Foam extinguishers

SECTION 6 - ACCIDENTAL RELEASE MEASURES

In case of battery rupture, or fume/fire under abuse, put the smoking /fire battery into water at once, or soak under water or spray with copious amounts of water, place in approved container after cooling, and dispose in accordance with local regulations.
Personal Precautions: Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side shields/face shield recommended.

SECTION 7 - HANDLING AND STORAGE

1.	Handling: can use forklifts or pallets, stand up the battery gently when move. Do not upside down or on its side or throw.
2.	Storage: store in a cool preferably condition (optimum temperature at +25℃±5℃) and ventilated area away from moisture, sources of heat, open flames. Keep adequate clearance between walls and batteries. Do not crush, pierce, short (+) and (-) battery terminals with conductive goods. Do not directly heat or solder batteries. Do not mix batteries of different types and brands. Do not mix new and used batteries; keep batteries in non-conductive or plastic trays. If need long term storage, do not store upside down, charge the batteries to 40-60% at first, and check the battery's open circuit voltage monthly is needed, make sure the voltage in the same batch to be consistent or difference within permitted extent. Charge the batteries immediately if the voltage of the batteries under 3.0V. The regular self-discharge rate is about 3% every month. Charge the batteries once per half year.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

1.	**Keep out of reach from children.**
2.	**Avoid contact with skin when the battery leak or rupture.**
3.	**Skin protection: Not necessary under normal use. Use rubber apron and protective working in case of handling of a ruptured battery.**
4.	**Eye protection: Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.**
5.	**Respiratory protection: Not necessary under normal use. In case of battery rupture, use self- contained full-face respiratory equipment.**

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical properties:	The lithium-ion rechargeable batteries are with sealed case, and under normal use and the seals remain intact, Victron LYP/LP series batteries are with no risk of explosion or fire. Only in case of abuse (i.e. abnormal mechanical power, heat, electrical power), which leads to activation of the safety valve or rupture of the battery container, which causes electrolyte leakage, electrode materials can react with moisture/water. In case of excessive internal pressure, a safety vent will open to protect the cell case from rupture.
Chemical Properties:	

Substance		**Melting Point**	**Boiling Point**	**Classification**			
CASNO	Chemical Formula			Exposure Limit	Indication Of Danger	Special Risk	Safety Advice (2)
12190-79-3	LiFeYPO4	> 1000°C	N/A			R22 R43	S2 S22 S24 S26 S36 S37 S43 S45
EC: 96-49-111 DMC: 616-38-6 DEC: 105-58-8 EA: 141-78-6	(DC-DM CDEC-EA) Organic Solution	EC : 38°C DMC : 4°C DEC : -43°C EA : -84°C	EC : 24°C DMC : 90°C DEC : 127°C EA : 77°C	Unfound OSHA	Inflammable	R21 R22 R41 R42 R43	S2 S24 S26 S36 S37 S45
21324-40-3	LiPF 6	N/A (Decomposing in 160°C)	N/A	Unfound OSHA	Stimulator Corrosion	R14 R21 R22 R41 R43	S2 S8 S22 S24 S26 S36 S37 S45

SECTION 10 - STABILITY AND REACTIVITY

1. Conditions to Avoid:	Heat above 85 °C or incinerate. Deform, mutilate, crush, disassemble, elongate or exposure to humid condition.
2.	Reaction of LiPF6 with water to form Oxyfluoride and CO2.
3.	Formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

SECTION 11 - TOXICOLOGICAL INFORMATION

Lithium rechargeable battery does not contain toxic materials.

SECTION 12 - ECOLOGICAL INFORMATION

Under normal conditions of use till the end of the service life, the battery can be recycled and won't bring any pollution to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

1. Dispose in accordance with applicable regulations, which vary from country to country.
2. Lithium-ion batteries should have their terminals insulated and be preferably wrapped in individual plastic bags prior to disposal.
3. Do not dispose of the battery into fire except for authorized agency.

SECTION 14 – TRANSPORT INFORMATION

1. UN-NO.3480

ARD /RID

Class 9 Packing Group II ADR/RID-Labels

Proper shipping name: Lithium-ion batteries, UN3480

IMO

Class 9 Packing Group II IMO-Labels
Proper shipping name: Lithium-ion batteries, UN3480

IATA-DGR

Class 9 Packing Group II ICAO-Labels
Proper shipping name: Lithium-ion batteries, UN3480

2. Victron Energy B.V. declares that UN Manual of Tests and Criteria, Part III, sub-section 38.3 is met
3. In airfreight, small Lithium-ion batteries (cells<20WH or packs>100WH) are considered as "Expected Lithium-ion Batteries", when they meet the requirements of Ed. 63 of IATA regulations (UN3480) and ICAO Packing Instruction 965 section II, specifying less than 10kg gross per package. Caption shipment can move as normal cargo under current IATA
4. In other cases (mainly for large cells >20WH or packs > 100WH), they are considered as Class 9 (See Packing Instruction 965 section I for airfreight).
5. In Seafreight, sealed Lithium-ion batteries are considered as "Lithium-ion Batteries-Not Restricted", when they meet the requirements of IMDG of IMO Dangerous Goods Regulations (UN3480).
6. The transport of rechargeable lithium-ion batteries is regulated by various bodies, refer to: IATA, IMO, ADR/RID.

SECTION 15 – REGULATORY INFORMATION

1. **Temperature range**

	Continuous	Instant
Storage	+25°C ±5°C	-45/+85°C
Discharge	30/80°C	-45/+85°C
Charge	0/75°C	-0/+75°C

2. Specific Energy: (Note: Wh = Normal voltage x Rated Ah) kg = Average battery weight)
3. Specific Pulse Power: 600w-1200w/kg Varies depending upon size
4. Mechanical Resistance: As defined in relevant IEC standard

SECTION 16 – OTHER INFORMATION

1. This information has been compiled from sources considered to be dependable and is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.
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