

## MATERIAL SAFETY DATA SHEET

Issue date: 2023-3-26 Rev: A.1

MSDS REF. NO.: Soluna 15K Pack HV (L-E)

### LITHIUM-ION RECHARGEABLE BATTERY

#### SECTION 1 MANUFACTURER'S INFORMATION

IDENTITY	Product Category	:	Rechargeable Li-ion Battery Pack
	Model Name	:	Soluna 15K Pack HV (L-E)
	Brand	:	SOLUNA
	Nominal Capacity	:	40Ah
	Nominal Voltage	:	390V
	Watt-hour	:	15kWh
	Chemical System	:	Lithium iron phosphate
	Designed for Recharge	:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

#### SECTION 2 MATERIAL AND INGREDIENTS INFORMATION

Common Chemical Name	Chemical Formula	CAS No.	Wt. %
Lithium iron phosphate (LiFePO <sub>4</sub> )	LiFePO <sub>4</sub>	15365-14-7	≤39.8
Graphite (C)	C	7782-42-5	≤19.8
Polyvinylidene Fluoride (PVDF)	PVDF	24937-79-9	≤0.8
Carboxymethyl cellulose	CMC	9004-32-4	≤0.4
Polymerized Styrene Butadiene Rubber	SBR	9003-55-8	≤0.8
Ethylene carbonate	EC	96-49-1	≤4
Dimethyl carbonate	DMC	616-38-6	≤4
Lithium hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	≤1.9
Copper	Cu	7440-50-8	≤6.2
Aluminum	Al	7429-90-5	≤3.8
Aluminum Case	-	-	≤3.6
Cathode cover	-	-	≤2.1

Anode cover	-	-	≤2.5
Other material	-	-	≤10.3

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## SECTION 3 Hazards identification

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Explosive risk	This article does not belong to the explosion dangerous goods
Flammable risk	This article does not belong to the flammable material
Oxidation risk	This article does not belong to the oxidation of dangerous goods
Toxic risk	This article does not belong to the toxic dangerous goods
Radioactive risk	This article does not belong to the radiation of dangerous goods
Mordant risk	This article does not belong to the corrosion of dangerous goods
Other risk	The watt-hour rate of the battery is 15kWh, which belong to the Class 9 dangerous goods.

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## SECTION 4 First aid measures

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Once battery shell rupture, content contact with the human body will produce harm, once contact, should take the following emergency measures:

**Eye:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

**Inhalation:** Remove from exposure and move to fresh air immediately. Use oxygen if available.

**Ingestion:** Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician

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## SECTION 5 Fire-fighting measures

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**Flash Point:** N/A.

**Auto-Ignition Temperature:** N/A.

**Extinguishing Media:** Water, CO<sub>2</sub>.

**Fire-Fighting Procedures :** Self-contained breathing apparatus

**Unusual Fire and Explosion Hazards:** Cell may vent when subjected to excessive heat-exposing battery contents.

**Hazardous Combustion Products:** Carbon monoxide, carbon dioxide, lithium oxide fumes.

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## **SECTION 6 Accidental release measures**

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### **Steps to be taken in case Material is Released or Spilled**

If the battery material is released, remove operators from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

### **Waste Disposal Method**

It is recommended to discharge the battery to the end. Use up the metal lithium inside the lithium metal battery, and delivered to professional institutions for further treatment.

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## **SECTION 7 Handling and storage**

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The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

### **Precautions to be taken in handling and storing**

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

### **Other Precautions**

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

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## **SECTION 8 Exposure controls/personal protection**

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### **Respiratory Protection**

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

### **Ventilation**

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Not necessary under conditions of normal use.

### **Protective Gloves**

Not necessary under conditions of normal use.

### **Other Protective Clothing or Equipment**

Not necessary under conditions of normal use.

### **Personal Protection is recommended for venting battery**

Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

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## **SECTION 9 Physical and chemical properties**

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**Appearance:** Cylindrical

**Ref, No.:** RZUN2022-0882

**Odour:** If leaking, smells of medical ether.

**pH:** Not applicable as supplied.

**Flash Point:** Not applicable unless individual components exposed.

**Flammability:** Not applicable unless individual components exposed.

**Relative density:** Not applicable unless individual components exposed.

**Solubility (water):** Not applicable unless individual components exposed.

**Solubility (other):** Not applicable unless individual components exposed.

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## **SECTION 10 Stability and reactivity**

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**Stability:** Product is stable under conditions described in Section 7.

**Conditions to Avoid :** Heat above 70°C or incinerate. Deform. Mutilate. Crush.

Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions.

**Materials to avoid:** Oxidising agents, alkalis, water.

**Hazardous Decomposition Products :** Toxic Fumes, and may form peroxides.

**Hazardous Polymerization :** N/A.

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons.

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## **SECTION 11 Toxicological information**

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**Signs & symptoms:** None, unless battery ruptures.

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

**Inhalation:** Lung irritant.

**Skin contact:** Skin irritant.

**Eye contact:** Eye irritant

**Ingestion:** Poisoning if swallowed.

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, moderate to severe irritation, burning and dryness of the skin may occur, Target organs nerves, liver and kidneys.

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## SECTION 12 Ecological information

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**Mammalian effects:** None known at present.

**Eco-toxicity:** None known at present.

**Bioaccumulation potential:** Slowly

Bio-degradable.

**Environmental fate:** None known environmental hazards at present.

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## SECTION 13 Disposal consideration

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Do not incinerate, or subject cells to temperature in excess of 70°C, Such abuse can result in loss of seal leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

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## SECTION 14 Transport information

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**Label for conveyance:** class 9 lithium battery hazard label, Cargo Aircraft Only Label

**UN number:** UN3480

**Packing group:** II

**Ems No:** F-A,S-I

**Marine pollutant:** No

**Proper Shipping name:** Lithium-ion batteries (Including lithium-ion polymer batteries)

**Hazard Classification:** The goods are complied with the requirements of Section IA of Packing Instructions 965 of 63rd DGR Manual of IATA (2022 Edition), Packing Instruction P903 of IMDG CODE (Amdt. 40-20) (2020 Edition), including the passing of the UN38.3 test.

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## SECTION 15 Regulation information

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Law information

《Dangerous Goods Regulations》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《International Maritime Dangerous Goods》

《Regulations concerning road transportation of dangerous goods》

《Agreement concerning the International Carriage of Dangerous Goods by Road》

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《Technical Instructions for the Safe Transport of Dangerous Goods》

《Classification and code of dangerous goods》

《Occupational Safety and Health Act》 (OSHA)

《Toxic Substance Control Act》 (TSCA)

《Consumer Product Safety Act》 (CPSA)

《Federal Environmental Pollution Control Act》 (FEPCA)

《The Oil Pollution Act》 (OPA)

《Superfund Amendments and Reauthorization Act Title III (302/311/312/313)》 (SARA)

《Resource Conservation and Recovery Act》 (RCRA)

《Safety Drinking Water Act》 (CWA)

《California Proposition 65》

《Code of Federal Regulations》 (CFR)

In accordance with all Federal, State and local laws.

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## SECTION 16 SPECIAL PROTECTION INFORMATION

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