SolarEdge Energy Bank – Emergency Response Guide

Contents

1 Overview

1.1 Version History

- Version 2.0 (October 2021): Updated section 1.3, Emergency Contacts.
- Version 1.0 (July 2021): Initial release

1.2 Rechargeable Lithium Ion Batteries: SolarEdge Products

The products referenced herein are exempt articles and are not subject to OSHA's Hazard Communication Standard requirements for preparation of Safety Data Sheets (SDS).

1.2.1 SDS

Safety Data Sheets (SDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article." OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during enduse; and (iii) which under normal conditions of use does not release more than very small quantities (e.g., minute or trace amounts) of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

1.2.2 USA

SolarEdge Energy Bank products meet the OSHA definition of "article." Therefore, they are exempt from the requirements *of the Hazardous Communication Standard therefore, a SDS is not required.*

1.2.3 EU

The products are no "substances" or "mixtures" according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as "articles". No substances are intended to be released during handling. Therefore, there is no obligation to supply a Safety Data Sheet according to Regulation (EC) 1907/2006, Article 31

1.3 Identification of Products and Company

Product	Rechargeable lithium-ion SolarEdge Energy Bank for use with SolarEdge inverters and modules and sub-assemblies that can be installed in the SolarEdge Energy Bank. Specific part numbers are listed below.	
Locations	USA	47505 Seabridge Drive, Fremont, CA, 94538 +1.510.353.1895
	Europe	Werner-Eckert-Str.6 81829 Munich +49(0)89.454.5970
	Australia	Suite 10, 23-25 Gipps Street, Collingwood, VIC 3066 +61 1800 465 567
Emergency Contacts	CHEMTREC	For Hazardous Materials [or Dangerous Good] Incidents: Spill, Leak, Fire, Exposure or Accident Call CHEMTREC Day or Night.
Emergency Telephone Numbers	• United States Territories and Canada:	1-800-424-9300
	• Europe:	See Regional Emergency Phone Numbers
	• Outside United States Territories, Canada, and Europe	See Regional Emergency Phone Numbers

SolarEdge Energy Bank contains battery subassemblies made up of rechargeable lithium-ion cells. SolarEdge Energy Bank and its respective battery subassemblies are covered by this document.

SolarEdge Energy Bank contains sealed lithium-ion battery cells that are similar to rechargeable batteries in many consumer electronic products. Cells are individually, hermetically sealed prisms (prismatic cells). Each of these cells contain lithium-ion electrodes and electrolyte (the approximate composition is listed below). THE CELLS AND BATTERIES DO NOT CONTAIN METALLIC LITHIUM. Individual cells have nominal voltages of approximately 3.6 V.

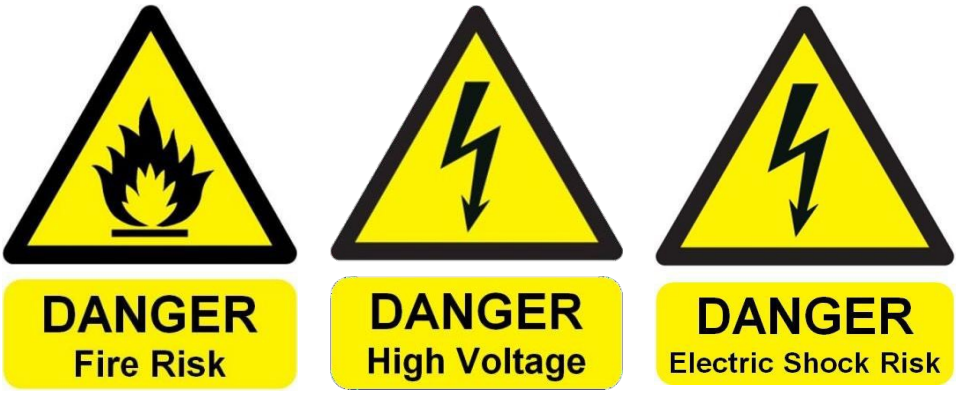
Materials/Ingredients of Battery Cells	Quantity by weight	EU-Classification
Cobalt oxide	< 30 %	Xn, N R22435053
Manganese dioxide	< 30 %	Xn R20/22
Nickel oxide	< 30 %	Carc. Cat. 1, T R49-43-48/23--53
Carbon	10 - 30 %	
Electrolyte	10 - 20 %	Carc. Cat. 3, C, R10-34-40-43
Polyvinylidene fluoride (PVdF)	< 10 %	
Aluminum foil	2 - 10 %	
Copper foil	2 - 10 %	
Aluminum and inert materials	5 - 10 %	

Attribute	Value	Unit
Part Number	BAT-10K1PS0B-01	
Description	SolarEdge Energy Bank battery	
Shipped Voltage	110	Vdc
Installed Voltage (Min – Nom – Max)	350 - 400 - 450	Vdc
Weight	267 / 121	lb / kg
Dimensions (W x H x D)	31.1 x 46.4 x 9.84 / 790 x 1179 x 250	In / mm

2 Handling and Use Precautions/ Identification of Hazards

The products described by this document are dangerous if mishandled. Injury to property or person, including loss of life is possible if mishandled.

SolarEdge Energy Bank contains lithium-ion cells. A cell is a source of energy. Do not short circuit, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the product's stated operating temperature (See section 2.1.3.) . An internal or external short circuit can cause significant overheating and provide an ignition source resulting in fire, including surrounding materials or materials within the cell or battery. The electrode materials and electrolyte they contain are not exposed while under normal conditions of use, as long as the battery integrity is maintained, and seals remain intact. Risk of exposure may occur only in cases of mistreatment be that mechanical, thermal, or electrical.



2.1.1 High Voltage Hazard

Correct handling of the product does not pose an electrical hazard under normal conditions of use, provided that the SolarEdge Energy Bank's enclosure remains closed. All of the constituent component battery cells are arranged inside a plastic structure and sealed within the Battery in a metal enclosure.

If the outer enclosure, Pod enclosures, and/or safety circuits are compromised or have been significantly damaged then a SolarEdge Energy Bank may present a significant high voltage and risk of electrocution. A battery pack, even in a normally discharged condition is likely to contain substantial electrical charge and can cause injury or death if mishandled. If a SolarEdge Energy Bank has been significantly visibly damaged or its enclosure compromised, then practice appropriate high-voltage preventative measures until the danger has been assessed and dispersed if required.

WARNING!

Never cut into a sealed SolarEdge Energy Bank enclosure due to the high voltage and electrocution risks.

For detailed installation / removal instructions please refer to the SolarEdge Energy Bank installation manual.

2.1.2 Hazards Associated with Mechanical Damage

Mechanical damage to a SolarEdge Energy Bank can result in several hazardous conditions including:

- Leaked cell electrolyte (see Section 2.1.4)
- Rapid heating of individual cells due to exothermic reaction of constituent materials (cell thermal runaway), venting of cells, and propagation of self-heating, and thermal runaway reactions to neighboring cells.
- Fire

To avoid mechanical damage to a SolarEdge Energy Bank, items should be stored in their original packaging when not being used or before being installed (see Section 2.4).

2.1.3 Hazards Associated with Elevated Temperature Exposure

The SolarEdge Energy Bank is designed to endure operating temperatures up to 50°C (122°F), with up to 100% operating humidity (condensing), and storage temperatures up to 60°C (140°F) and <95% relative humidity (non-condensing) for up to 24 hours.

Exposure of SolarEdge Energy Bank to high temperatures can drive battery cells into thermal runaway and result in a fire.

- Storage for more than 24 hours at temperatures above approximately 80°C (176°F) could result in cell thermal runaway reactions and should be avoided.

- Storage for more than a few minutes at temperatures above approximately 150°C (302°F) could result in cell thermal runaway reactions and should be avoided.

Exposure of a SolarEdge Energy Bank to localized heat sources such as flames could result in cell thermal runaway reactions and should be avoided.

2.1.4 Hazards Associated with Leaked Electrolyte

The electrolyte within constituent cells includes a volatile hydrocarbon-based liquid and a dissolved lithium salt such as lithium hexafluorophosphate which acts as the source of lithium ions. The electrolyte is mostly absorbed in electrodes within individual sealed cells. Under normal conditions of use no one handling the SolarEdge Energy Bank should contact the electrolyte.

Mechanical damage such as severe crushing can cause a small amount of electrolyte to leak out of a cell.

Electrolyte can be extracted from a single cell using a centrifuge, or under some extreme conditions of abuse such as a crush.

Any released electrolyte liquid is likely to quickly evaporate, leaving behind a white salt residue. Evaporated electrolyte is flammable and contains alkyl-carbonate compounds. Leaked electrolyte is colorless and characterized by a sweet odor. If such an odor is obvious, evacuate or clear the surrounding area and ventilate the area.

WARNING!

Avoid contact with electrolyte.

Leaked electrolyte solution is flammable and corrosive and can act as an irritant to the eyes and skin. If a liquid is observed that is suspected of being an electrolyte, ventilate the area and avoid contact with the liquid until a positive identification can be made and adequate protective equipment can be obtained (eye, skin, and respiratory protection). Chemical classifier strips can be used to identify the spilled liquid (electrolyte will contain petroleum/organic solvent and fluoride compounds).

For an electrolyte leak, the following protective equipment is recommended: an air purifying respirator with organic vapor/acid gas cartridges, safety goggles or a full face respirator,and safety gloves (Butyl rubber or laminated film (e.g., Silver Shield)). Protective clothing should be worn. Use a dry absorbent material to clean up a spill.

2.1.5 Hazards Associated with Vented Electrolyte

Lithium-ion cells are sealed units, and thus under proper usage and normal conditions, venting of electrolyte should not occur. If lithium-ion cells are subjected to abnormal heating or other conditions of abuse, electrolyte and electrolyte decomposition products can vaporize and be vented from cells. Vented gases are a common early indicator of a thermal runaway reaction – an abnormal and hazardous condition.

If gases or smoke are observed escaping from a SolarEdge Energy Bank, evacuate the area and notify a first responder team and/or the local fire department. Gases or smoke exiting a lithium-ion battery pack are likely flammable and could ignite unexpectedly as the condition that led to cell venting may also cause ignition of the vent gases. A venting SolarEdge Energy Bank should only be approached with extreme caution by trained first responders equipped with appropriate personal protective equipment (PPE), as discussed in Section 2.2.

The composition of cell vent gas depends on several factors, including cell composition, cell state of charge, and the cause of cell venting. Vent gases may include volatile organic compounds (VOCs) such as alkyl-carbonates, methane, ethylene, and ethane; hydrogen gas; carbon dioxide; carbon monoxide; soot; and particulates containing oxides of nickel, aluminum, lithium, copper, and cobalt. Additionally, phosphorus pentafluoride, POF_3, and HF vapors may form.

WARNING!

Avoid contact with vented gases.

Vented gases may irritate the skin, eyes, and throat. Cell vent gases are normally hot; upon exit from a cell, vent gas temperatures can exceed 600°C (1,110°F). Contact with hot gases can cause thermal burns. Vented electrolyte is flammable and may ignite on contact with a source of ignition such as an open flame, spark, or a sufficiently heated surface.

Vented electrolyte may also ignite on contact with cells undergoing a thermal runaway reaction.

2.2 Firefighting Measures

Responding to a Venting SolarEdge Energy Bank: Smoke venting from a SolarEdge Energy Bank is an indication of an abnormal and hazardous condition. Smoke is the most obvious first sign of a thermal runaway event, though other signs include loud banging sounds heard from the SolarEdge Energy Bank or heat emanating from the SolarEdge Energy Bank. Any smoke venting from the SolarEdge Energy Bank is probably flammable and may ignite at any time. If fire or smoke is seen being expelled from a SolarEdge Energy Bank at any time, the following should be performed:

1. If possible, turn off the unit/system
2. Evacuate the area
3. Inform suitably trained first responders and the local fire department that there is a potential chemical fire involving Li-Ion cells.

The SolarEdge Energy Bank should then be monitored for evidence of continued venting of smoke. Spraying with high volumes of water from a safe distance may help cool the unit and prevent further reaction or a fire from developing. In public agencies an Incident Command System is used to manage emergencies as defined by FEMA (Federal Emergency Management Agency). Where an Incident Command System is in place, if a fire erupts and visible flames appear, the Incident Commander should determine whether an attempt will be made to suppress the fire (aggressive firefighting) or allow the battery to burn until it self-extinguishes, while protecting surrounding materials (defensive firefighting). SolarEdge recommends that large volumes of water be used from a safe distance to fight a fire involving a SolarEdge Energy Bank. Water will suppress flames and can cool cells, limiting propagation of thermal runaway reactions.

However, if water is used, electrolysis of water (splitting of water into hydrogen and oxygen) may contribute to the flammable gas mixture formed by venting cells, burning plastic, and burning of other combustibles.

Gaseous agents such as CO2 or Halon, or dry chemical suppressants may temporarily suppress flaming of lithium-ion battery packs, but they will not cool lithium-ion batteries and will not limit the propagation of cell thermal runaway reactions. Metal fire suppressants such as LITH-X, graphite powder, or copper powder are not suitable substances for suppressing fires involving lithium-ion battery packs as they are unlikely to be effective.

A battery fire may continue for several hours and it may take 24 hours or more for the battery pack to cool. Lithium-ion battery fires that have been extinguished can re-ignite due to the exothermic reaction of constituent materials from broken or damaged cells. To prevent this, remove sources of ignition and cool the burned mass by flooding with water.

Aggressive Firefighting: If a decision is made to aggressively fight a fire involving a SolarEdge Energy Bank, then copious amounts of water should be applied from a safe distance. The water may not suppress all cell thermal runaway reactions within the battery pack, but it may cool cells and control the spread of the fire.

Defensive Firefighting: Having decided to fight a SolarEdge Energy Bank fire defensively, then the fire crew should retreat a safe distance and allow the battery to burn itself out. Fire crews may choose to use a water stream or fog pattern to protect exposures or control the path of smoke. A battery fire may continue for several hours and may result in multiple re- ignition events. It may take 24 hours or longer for the battery pack to cool.

Firefighter PPE. Firefighters should wear self-contained breathing apparatus (SCBA) and fire protective turnout gear. Cells or batteries may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over voltage conditions. These vapors may include volatile organic compounds (VOCs), hydrogen gas, carbon dioxide, carbon monoxide, soot, and particulates containing oxides of nickel, aluminum, lithium, copper, and cobalt. Additionally, phosphorus pentafluoride, POF3 and HF vapors may form.

2.3 First Aid Measures

Electric Shock / Electrocution: Get immediate medical aid if an electrical shock or electrocution has occurred or is suspected.

Contact with Leaked Electrolyte: The constituent battery cells are sealed. The content of an open or broken constituent battery cell can cause skin irritation and/or chemical burns. If materials from a ruptured or otherwise damaged cell or battery contact the skin, flush immediately with water and wash the affected area with soap and water. If a chemical burn occurs or if irritation continues, get medical assistance.

For eye contact, flush with large amounts of water for 15 minutes without rubbing and see a doctor immediately.

Inhalation of Electrolyte Vapors: If electrolyte vapors are inhaled, move person into fresh air. If the person has stopped breathing administer artificial respiration. Get immediate medical assistance.

Vent Gas Inhalation: If vent gases are inhaled, move person into fresh air. If the person has stopped breathing administer artificial respiration. Get immediate medical assistance.

2.4 Storage Precautions

SolarEdge Energy Bank batteries should be stored in the original shipping packaging as supplied, and as indicated on the packaging prior to installation.

Do not store a SolarEdge Energy Bank in a way that allows terminals to short circuit (do not allow the formation of an electrically conductive path).

Elevated temperatures can result in reduced battery service life. SolarEdge Energy Bank batteries can resist temperatures of -40°C to 60°C for up to 24 hours. However, a SolarEdge Energy Bank stored for longer than 24 hours should be stored at lower temperatures at humidity <95% and be protected from condensation as follows.

Storage Duration	Allowable Temperature Range
Up to 3 months*	–30 °C to 60 °C (–22 °F to 140 °F)
Between 3 and 12 months	–10 °C to 30 °C (–14 °F to 86 °F)

*Start date from production date.

If the products are stored for more than 12 months in their original package DO NOT ship them before contacting the SolarEdge support team for technical guidelines.

A SolarEdge Energy Bank should not be stored untended for longer than twelve months since the battery service life will probably be unfavorably affected.

Storage in areas where temperatures routinely approach or exceed 80°C (176°F) could result in a hazardous condition. Do not store a SolarEdge Energy Bank near heating equipment.

The storage area should be protected from flooding.

Long-term storage areas should be compliant with the appropriate local fire code requirements.

The acceptable storage density of battery packs and storage height of battery packs is defined by the local authority having jurisdiction (AHJ). Requirements and limits will be based upon several factors including the structural and fire protection characteristics of the storage area and recommendations for fire protection as declared by the National Fire Protection Association (NFPA) or similar organizations. As of this time SolarEdge is unaware that any Commodity Classification has been defined for lithium-ion cells or battery packs (see 2016 NFPA 13: Standard for the Installation of Sprinkler Systems). Until a Commodity Classification has been defined based on testing by NFPA or a similar organization, SolarEdge recommends treating lithium-ion cells and batteries in packaging as equivalent to a Group A Plastic Commodity.

2.5 Installation Precautions

Elevated temperatures can result in a hazardous condition.

Make sure the installation location doesn't exceed the battery Operating temperature range between -10°C and 50°C. Installation in areas where temperatures routinely approach or exceed 80°C (176°F) could result in a hazardous condition. Do not install the battery near heating equipment.

The installation location should be protected from the risk of flooding. If the battery is installed in an area below the floodplain, where flooding can occur, flood prevention should be implemented to prevent more than 30cm of standing water for a maximum of 30 minutes.

Installation locations should follow local fire code requirements and the instructions and warnings in the installation guide.

2.6 Handling, Storage, and Transportation of Damaged SolarEdge Energy Bank

If a SolarEdge Energy Bank has been damaged (battery enclosure has been dented or compromised), it is possible that heating is occurring that may eventually lead to a fire. Damaged or opened cells/batteries can result in rapid heating (due to exothermic reactions of the constituent materials), the release of flammable vapors, and propagation of self-heating and thermal runaway reactions to neighboring cells.

Before handling or transporting a damaged SolarEdge Energy Bank, wait at least one hour. Smoke may indicate that a thermal reaction is in progress. If no smoke, flame, leakage of electrolyte, leakage of coolant, or any other signs of heat has been observed for one hour, the SolarEdge Energy Bank may be disconnected and moved into a safe location. To obtain specific instructions for evaluating, disconnecting, and preparing a damaged SolarEdge Energy Bank for transport, please contact the SolarEdge Service team.

A damaged SolarEdge Energy Bank should be monitored during storage for evidence of smoke, flame, leakage of electrolyte, leakage of coolant, or signs of heat. If the Product cannot be monitored full-time, for example during extended storage, the Product should be moved to a safe storage location.

Safe storage locations for damaged batteries must be free of flammable materials, accessible only by trained professionals, and 50 feet downwind of occupied structures. For example, a fenced, open yard may be an appropriate safe location.

DO NOT STORE DAMAGED SolarEdge Energy Banks ADJACENT TO UNDAMAGED SolarEdge Energy Banks.

A damaged battery may suffer further damage during transportation and may lead to a fire. To further reduce this risk, handle the damaged battery with extreme caution.

2.7 Disposal Procedures

SolarEdge Energy Bank batteries do not contain heavy metals such as lead, cadmium, or mercury.

Disposal of or recycling of SolarEdge Energy Banks should conform to local, state, and federal regulations. Note that regulations regarding disposal of batteries vary by jurisdiction.

If disposing of the SolarEdge Energy Banks without return to SolarEdge, please consult with local, state and/or federal authorities as to suitable methods of disposal and recycling.

2.8 Maintenance or Repair

The Battery and its components are not user serviceable.

Do not attempt to open, disassemble, repair, tamper with, or modify the Battery. The Battery cells are not replaceable. Contact SolarEdge Support for guidance on repairs.

2.9 Transport Information

Lithium-ion batteries are regulated as Class 9 Miscellaneous dangerous goods (also known as “hazardous materials”) pursuant to the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air, International Air Transport Association (IATA) Dangerous Goods Regulations, the International Maritime Dangerous Goods (IMDG) Code, European Agreements concerning the International Carriage of Dangerous Goods by Rail (RID) and Road (ADR), and applicable national regulations such as the USA’s hazardous materials regulations (see 49 CFR 173.185) or similar local regulations as applicable. These regulations contain very specific packaging, labeling, marking, and documentation requirements. The regulations also require that individuals involved in the preparation of dangerous goods for transport be trained on how to properly package, label, mark and prepare shipping documents.

UN Number	3480
Proper Shipping Name	Lithium Ion Batteries
Hazard Classification	Class 9 Miscellaneous
Packing Group	N/A

3 Regional Emergency Phone Numbers

Country	Local Number	Toll-Free Number
Australia	+61 2 9037 2994	1800 862 115
Austria	+43 1 3649237	0800 293702
Belgium	+32 2 808 32 37	
Canada	+1 703-741-5970	1-800-424-9300
Czech Republic	+420 228 880 039	
Denmark	+45 69 91 85 73	
Finland	+358 9 42419014	
France	+33 9 75 18 14 07	
Germany	+49 69 643508409	0800 1817059
Greece	+30 21 1176 8478	
Hungary	+36 1 808 8425	
Iceland	+354 539 0655	
Ireland	+353 1 901 4670	
Israel	+972 3-763-0639	
Italy	+39 02 4555 7031	800 789 767
Latvia	+371 66 165 504	
Lithuania	+370 5 214 0238	
Luxembourg	+352 20 20 24 16	
Macedonia	+389 2 551 7456	
Mexico		800 681 9531
Netherlands	+31 85 888 0596	
New Zealand	+64 9-801 0034	0800 425 459
Panama	+507 832-2475	
Poland	+48 22 398 80 29	
Portugal	+351 308 801 773	
Romania	+40 376 300 026	
Russia		8 (800) 100-63-46
Singapore	+65 3158 1349	800 101 2201
Slovakia	+421 2/330 579 72	
Slovenia	+386 1 888 80 16	
South Africa		080 098 3611
South Korea		080 822 1374
Spain		900 868 538
Sweden	+46 8 525 034 03	
Taiwan	+886 2 7741 4207	00801-14-8954
Ukraine	+380 94 710 1374	
United Kingdom	+44 20 3807 3798	
United States	+1 703-741-5970	1-800-424-9300