

Safety Data Sheet

Product: Sodium-ion Battery	Model: SIB12V60P2
SDS No.: SODION-SDS-P2-60-001	Date of issue: 2026-07-09
Issuing company: Sodion Energy Pte Ltd	Version: 1.0

1. Product and Company Identification

Product name	Sodium-ion Battery
Model / Part code	SIB12V60P2
Type	12 V / 60 Ah / 720 Wh; 4S6P cylindrical sodium-ion cells
Intended use	Starter and auxiliary power battery for vehicles, equipment, and stationary applications
Distributor / Seller	Sodion Energy Pte Ltd
Address	75 Ayer Rajah Crescent, #01-01, Singapore 139953
Email	contact@sodione.com
Website	sodione.com
Emergency contact	contact@sodione.com (business hours)

2. Hazard Identification

GHS classification	Not classified as a hazardous substance under normal conditions of use (intact, sealed assembly). See Section 14 for transport hazard class.
GHS label elements	No pictograms, signal word, or hazard statements required for intact battery.
Health hazards	The battery is not hazardous when used in accordance with the manufacturer's instructions. In the event of mechanical damage, short circuit, overcharge, or thermal abuse, there is a risk of rupture, fire, overheating, and release of internal components. Electrolyte vapour and combustion products may irritate eyes, skin, and respiratory tract.
Physical hazards	Risk of fire and explosion under severe abuse conditions (see Section 5). No explosive or flammable hazard under normal use.
Other hazards	Damaged batteries may contain pressurised electrolyte; do not puncture or crush. Keep away from children.

3. Composition / Information on Ingredients

The battery is a sealed electrochemical assembly. The following components may pose a hazard if the battery is damaged and internal materials are exposed. Concentrations are approximate and relate to the cell content by mass.

Chemical name	CAS No.	Concentration (mass %)	Component role
Sodium copper iron manganese layered oxide	N/A	34.2 - 38.2	Cathode active material
Copper (Cu)	7440-50-8	30.5 - 34.5	Current collector, terminals, busbars
Hard carbon	7440-44-0	14.26 - 15.64	Anode active material
Aluminium (Al)	7429-90-5	0.31 - 0.51	Cathode current collector
Sodium hexafluorophosphate (NaPF ₆)	21324-39-0	0.11 - 0.35	Electrolyte salt
Sodium perchlorate (NaClO ₄)	7601-89-0	0.12 - 0.39	Electrolyte additive
Dimethyl carbonate (DMC)	616-38-6	0.17 - 0.26	Electrolyte solvent
Diethyl carbonate (DEC)	105-58-8	0.16 - 0.28	Electrolyte solvent
Ethyl methyl carbonate (EMC)	623-53-0	0.12 - 0.51	Electrolyte solvent
Carboxymethyl cellulose (CMC binder)	9004-32-4	<1	Electrode binder

Labelling per GHS (UN GHS 9th edition). No GHS hazard symbols or phrases apply to the intact sealed battery assembly. CAS No. = Chemical Abstracts Service Registry Number. N/A = not applicable.

4. First-Aid Measures

Eye contact	Immediately flush eyes with large quantities of clean water for at least 15 minutes, holding eyelids open. Seek medical attention promptly.
Skin contact	Remove contaminated clothing. Rinse affected skin with copious water for at least 15 minutes. Seek medical attention if irritation persists.
Inhalation	Move person to fresh air immediately. Administer oxygen if breathing is difficult. Seek medical attention if symptoms persist.
Ingestion	Rinse mouth with water. Do not induce vomiting. Seek medical attention immediately.
Most important symptoms	Vapour from leaking electrolyte may cause eye and mucous membrane irritation; prolonged skin exposure may cause redness. Thermal decomposition products may cause respiratory irritation.
Advice to physician	Treat symptomatically. In case of inhalation of combustion products, observe for delayed pulmonary oedema.

5. Fire-Fighting Measures

Suitable extinguishing media	Dry chemical powder, carbon dioxide (CO ₂), foam. Apply copious water spray to cool batteries adjacent to the fire and prevent propagation; direct water to battery cells only with caution.
Unsuitable extinguishing media	High-pressure direct water jet on an actively burning battery (may spread electrolyte). Halon.
Hazardous combustion products	Carbon monoxide (CO), carbon dioxide (CO ₂), hydrogen fluoride (HF), sulphur oxyfluoride (SOF ₂), nitrogen oxides. Quantities depend on degree of thermal event.
Special fire-fighting procedures	Wear self-contained breathing apparatus (SCBA) and full protective clothing. Batteries may reignite after apparent extinguishment; maintain monitoring for at least 24 hours. Evacuate non-essential personnel. Cool non-burning batteries with water spray.
Unusual fire and explosion hazards	Thermal runaway may cause rapid pressure build-up and rupture of the battery casing. Multiple adjacent batteries may cascade.

6. Accidental Release Measures

Personal precautions	In the event of battery rupture or electrolyte leakage: avoid contact with skin, eyes, and clothing. Ensure adequate ventilation. Use personal protective equipment described in Section 8. Keep bystanders away and upwind. Refer to Sections 7 and 8 for further guidance.
Environmental precautions	Prevent released material from reaching drains, surface water, or soil. Report significant spills to the relevant environmental authority (Singapore: National Environment Agency, NEA).
Containment and clean-up	Absorb spilled electrolyte with dry inert material (dry sand or dry earth). Transfer contaminated absorbent into a sealed, labelled waste container. Scrub affected area with detergent and water; collect all contaminated washwater for proper disposal per Section 13. Do not wash into drains.

7. Handling and Storage

Handling

- Do not short-circuit, overcharge, or reverse-charge.
- Do not disassemble, crush, puncture, or deform.
- Do not expose to temperatures above 65 °C or to open flame.
- Do not immerse in water or other liquids.
- Avoid dropping or mechanical shock.
- Install with correct polarity. Consult product documentation before use.
- Handle in accordance with good industrial hygiene and safety practice.

Storage

- Store in a cool, dry, well-ventilated area; recommended temperature 10 °C to 35 °C.
- For long-term storage (>3 months), maintain state of charge (SOC) at 30 - 50 %.
- Keep away from heat sources, direct sunlight, corrosive materials, and oxidising agents.
- Store locked away and out of reach of children.
- Do not stack beyond approved height; protect terminals from accidental short-circuit.

8. Exposure Controls / Personal Protection

Engineering controls

Ensure adequate ventilation in battery storage and charging areas. If working with multiple batteries in enclosed spaces, provide mechanical ventilation. Install smoke and thermal sensors in battery storage rooms.

Eye and face protection

Safety glasses or goggles when handling a visibly damaged battery or performing maintenance. Not required for routine handling of an intact battery.

Skin and body protection

Chemical-resistant gloves (nitrile or neoprene) if contact with electrolyte is possible (e.g. handling a damaged battery). Not required for routine handling of an intact battery.

Respiratory protection

Not required under normal conditions. If working in an area where smoke or fumes from a damaged battery are present, use a full-face respirator with appropriate cartridge (HF/organic vapour). For firefighting, use SCBA.

9. Physical and Chemical Properties

Form	Solid assembly, rectangular cuboid
Colour	Black (outer casing)
Odour	Odourless (intact); characteristic ether-like odour if electrolyte is released
pH	Not applicable as supplied (sealed assembly)
Flash point	Not applicable (sealed assembly); electrolyte solvents flammable if exposed
Flammability	Not applicable (sealed assembly)
Relative density	Not applicable (sealed assembly)
Nominal voltage	12 V
Voltage range	8.0 V - 16.0 V
Rated capacity	60 Ah (0.5C discharge, 25 °C)
Rated energy	720 Wh
Mass	9.86 kg
Dimensions (L x W x H)	230 mm x 175 mm x 181 mm
Operating temperature	-20 °C to +65 °C (discharge); 0 °C to +45 °C (charge)
Storage temperature	-20 °C to +40 °C (short term); 10 °C to +25 °C (long term, >3 months)

10. Stability and Reactivity

Chemical stability	Stable under recommended storage and handling conditions.
Possibility of hazardous reactions	None under normal conditions. Under severe abuse (short circuit, overcharge, mechanical damage, extreme heat), thermal runaway may occur with associated heat, gas generation, and possible venting or rupture.
Conditions to avoid	Temperatures above 65 °C; prolonged exposure to moisture (terminal areas); short circuit; physical impact; overcharge; over-discharge below 8 V.
Incompatible materials	Strong acids, strong bases, oxidising agents; water if electrolyte is exposed.
Hazardous decomposition products	Carbon oxides (CO, CO ₂), hydrogen fluoride (HF), sulphur-containing fluorides. Generated only under fire or severe thermal abuse conditions.

11. Toxicological Information

Acute toxicity	The battery is not acutely toxic when intact. If internal components are exposed, electrolyte solvents (DMC, DEC, EMC) may be mildly to moderately toxic by ingestion or inhalation; sodium salts may cause irritation.
Irritation / corrosion	Electrolyte solvents may cause mild skin and eye irritation. HF generated in fire or thermal event is corrosive to eyes, skin, and respiratory tract.
Sensitisation	No known sensitising properties under normal conditions of use.
Carcinogenicity	No components are classified as carcinogenic (IARC, NTP, OSHA) under normal conditions of use.
Reproductive toxicity	No data available for the battery assembly under normal conditions of use.
Routes of exposure	Eye contact, skin contact, and inhalation are the primary routes if the battery is damaged. Ingestion is not a route of exposure during normal use.

12. Ecological Information

Ecotoxicity	The sealed battery presents no direct ecotoxicological hazard under normal use. If internal components are released, electrolyte solvents (DMC, DEC, EMC) may be harmful to aquatic organisms. Copper and aluminium are toxic to aquatic life at elevated concentrations.
Persistence and degradability	Organic electrolyte solvents are expected to degrade in the environment. Metal components (copper, aluminium) are persistent.
Bioaccumulation potential	Carbon and sodium compounds are not expected to bioaccumulate significantly. Copper may bioaccumulate in certain organisms at high environmental concentrations.
Mobility in soil	Not applicable in normal use. In the event of electrolyte release, organic solvents may leach into soil and groundwater.
Other adverse effects	Do not allow undiluted material to reach groundwater, watercourses, or sewage systems.

13. Disposal Considerations

Waste treatment

- Do not dispose of used batteries as ordinary household or industrial waste.
- Do not incinerate, puncture, or dismantle prior to disposal.
- Discharge battery to minimum SOC (30 % or below) before sending for recycling.
- Return to an authorised battery recycler or designated collection point.
- In Singapore: comply with National Environment Agency (NEA) used battery disposal and extended producer responsibility guidelines.
- Dispose of contaminated absorbent materials (from spill clean-up) as chemical waste in accordance with local regulations.

Regulatory note

Observe all applicable national and local regulations governing the disposal of battery waste. Best practice is recycling - sodium-ion cells contain recoverable sodium, carbon, and metal materials.

14. Transport Information

Transport regulations for sodium-ion batteries (UN 3551/3552/3553) took effect from 2023 and are referenced in the 23rd revised edition of the UN Model Regulations. All transport must comply with the applicable modal regulations.

Parameter	IATA (Air)	IMDG (Sea)	ADR / UNECE (Road/Rail)
UN number	UN 3551 (packed with equip.) / UN 3552 (in equip.) / UN 3553 (standalone)	UN 3551 / UN 3552 / UN 3553	UN 3551 / UN 3552 / UN 3553
Proper shipping name	Sodium-ion batteries (packed with equipment) / (contained in equipment) / standalone	Sodium-ion batteries (packed with equipment)	Sodium-ion batteries
Hazard class	Class 9	Class 9	Class 9
Packing group	II	II	II
Reference	IATA DGR 66th edition (2025); PI 976 / PI 977 Sec. I / PI 978 Sec. I	IMDG Code 2024 (Amdt 42-24)	ADR/ADN from 1 January 2025
Special precautions	Limit SOC to max 30 % for air transport. Batteries must have passed UN 38.3 tests (CMC250815044). Protect against short circuit; terminals must be insulated or covered.		
UN 38.3 test report	CMC250815044 (CMC Testing International, Shenzhen; issued 2025-09-26; SIB12V60P2; 9.86 kg; Pass)		
EmS (sea)	F-A (general fire procedure); S-I (flammable solids, repacking permitted)		
Marine pollutant	No		

15. Regulatory Information

The following regulations are applicable to the sodium-ion battery assembly or its components. This list is not exhaustive.

- **UN GHS (9th edition, 2021):** Not classified as hazardous for the sealed assembly.
- **UN Model Regulations (23rd revised edition):** Classification UN 3551/3552/3553, Class 9.
- **IATA DGR 66th edition (2025):** PI 976/977/978 apply.
- **IMDG Code 2024 (Amdt 42-24):** Sea transport applicable.
- **IEC 62619:2022:** Safety requirements for secondary lithium/sodium-ion cells and batteries - certified (CMC250905004, 12 V 60 Ah 720 Wh; issued 2025-10-09).
- **Singapore Environmental Protection and Management Act (EPMA):** Dispose of as scheduled waste per NEA guidelines.
- **Singapore Civil Defence Act / Fire Safety Act:** Observe fire safety requirements for battery storage and charging installations.
- **OSHA Hazard Communication Standard (29 CFR 1910.1200, US):** Not classified as a hazardous chemical for the sealed battery.

16. Other Information

SDS issue date	2026-07-09
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Prepared by	Sodion Energy Pte Ltd
Supersedes	N/A (first issue)

Electrochemical reaction:

Sodium-ion intercalation chemistry. During discharge, sodium ions (Na+) migrate from the hard-carbon anode through the electrolyte and intercalate into the sodium copper-iron-manganese oxide cathode. Charging reverses this process. No lithium is present.

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