

SAFETY DATA SHEET

according to Work Health and Safety Regulations 2011

Li-ion battery Powerwall LiFePO4 battery

Part number: GSL051200A-B-GBP2

Revision Date: 15/12/2022

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product identifier: Part number: GSL051200A-B-GBP2

Other means of identification: Trade name : Li-ion battery Powerwall LiFePO4 battery

Recommended use of the chemical and restrictions on use: Use of the Substance/Mixture: Battery.

Details of manufacturer or importer:

Eakoh Australia Pty Ltd

48 Dalzell Crescent Darling

Heights Qld 4350

Telephone: 0400687985 Email:

edmund@eakoh.com

WJL Electrical PTY LTD

5 Beaufort St, Taminda NSW 2340.

Mr. Chris Weaver

0439188718

info@wjlectrical.com.au

Manufacturer:

Shenzhen GSL Energy Co., Ltd.

A503, Building 1, Tiana Cyber Park, Long Gang Central City,

Shenzhen, Guangdong, China. Telephone: +86 755-

84515360 Email: sales@gsl-energy.com

Emergency phone number

Poisons Information Centre (24 hours) Telephone: 13 1126

2. HAZARDS IDENTIFICATION

Lithium Ion batteries are classified as manufactured 'articles' and are not hazardous when operated in accordance with the manufacturers recommendations. Batteries present no chemical hazards during normal operation provided the recommendations for handling, storage, transport and usage are followed. If the battery is broken and the internal components exposed, health hazards exist which require careful attention. When a battery cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 °C, it will cause heat generation and ignition.

The chemical hazards relate to the released contents (internal electrolyte). Undamaged sealed batteries normally present a low hazard, however damaged batteries may release toxic, harmful and irritating contents. Disassembly, abuse or destruction of battery cell may cause violent explosion with scattering of contents. Heating may cause bursting of contents.

GHS Hazard Classification:

(According to Work Health and Safety Regulations 2011)

Not classified as a hazardous chemical according to Safe Work Australia criteria.

Label elements

No GHS signal word, pictograms, hazard or precautionary statements have been allocated.

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Other hazards and precautions:

- When recharging batteries, never use chargers which are unsuitable for the battery type.
- Do not short-circuit batteries.
- Do not inflict mechanical damage (puncturing, deforming, disassembling etc.).
- Do expose to heat or incinerate them.
- Keep batteries away from small children.
- Always store batteries in a dry and cool place.
- Contact with leaking battery substances may pose a danger to personal health and the environment. For this reason, when coming into contact with batteries with a conspicuous appearance (leaking substances, deformed, discoloured, dented or the like), adequate PPE and breathing protection is required. Lithium batteries can, for example, react very strongly in combination with fire. This can result in battery components being ejected with considerable force.

Handling and operational safety

Lithium batteries are always to be handled in accordance with the manufacturer's specifications. This is true particularly for complying with the limits for maximum current load, charging and end-point voltages, and mechanical and thermal loads.

Usually product packages are marketed that have already been matched. Such products are not to be modified or tampered with, since that could result in substantial safety hazards. Use only the charging process tailored to the respective cell type of a rechargeable battery.

Danger

As with other batteries, so also for lithium batteries it is true that even when thought to be discharged, they can still represent a source of danger. They can deliver a very high short-circuit current, however, even in the state of the minimum permitted end-point voltage lithium batteries with a high voltage (over 75 Volts) can pose a danger of a lethal electric shock.

For most products, deep discharge beyond the documented limits leads to permanent damage. Deepdischarged lithium batteries are no longer permitted to be re-charged or operated.

In all cases, avoid excessive charging voltages and overcharging. This can lead directly to critical situations, but also have a negative impact on battery life.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Battery Cells

The following components are found inside the sealed Li-ion cell. Cells have been further combined as larger battery modules and systems using mechanical parts.

CHEMICAL NAME	CAS No.	Concentration [%]
Lithium Iron Phosphate	15365-14-7	49.5
Vinylidene fluoride, polymer (PVDF)	24937-79-9	0.33
Aluminium	7429-90-5	7.6
Graphite	7782-42-5	16.3
Styrene, 1,3-butadiene polymer (SBR)	9003-55-8	0.05
Carboxymethylcellulose	9000-11-7	0.28
Copper	7440-50-8	6.96
Nickel	7440-02-0	0.06
Lithium Hexafluorophosphate	21324-40-3	10.96
Polyethylene	9002-88-4	4.03
Poly[imino(1-oxo-1,12-dodecanediyl)]; (Nylon 12)	24937-16-4	3.93

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4. FIRST AID MEASURES

General advice: When handled and stored in accordance with the manufacturer's recommendations, lithium batteries are not hazardous. The chemicals listed in item 3 are enclosed in a sealed housing so that they cannot escape during normal use. The following measures are only applicable if exposure has occurred to the components when a battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused or damaged.

If inhaled: If affected by content vapours, remove the patient from further exposure into fresh air, if safe to do so. If providing assistance, avoid exposure to yourself - only enter contaminated environments with adequate respiratory equipment. Once removed, lay patient down in a well-ventilated area and reassure them whilst waiting for medical assistance. If not breathing, provide artificial respiration and seek immediate medical assistance. If unconscious, place in a recovery position and seek immediate medical assistance. As the electrolyte is corrosive and decomposition may cause corrosive and toxic vapours, if the person has inhaled vapours and is having difficulty breathing, immediately call a Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766) or doctor/physician.

In case of skin contact: If skin or hair contact has occurred with the contents, remove any contaminated clothing and footwear, wash skin or hair thoroughly with soap and water. As the product is rated as a Corrosive that Causes severe skin burns, after flushing, immediately call a Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766) or doctor/physician.

In case of eye contact: If the contents come into contact with the eyes, hold eyelids apart and flush the eye immediately with large amounts of running water. Continue flushing for at least 15 minutes or until advised to stop by a Doctor. Check for contact lenses. If there are contact lenses, these should be removed after several minutes of rinsing by the exposed person or medical personnel if it can be done easily. As the content is rated as Causes severe eye damage, after flushing, immediately call a Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766) or doctor/physician.

If swallowed: If the contents have been swallowed (ingested), rinse mouth out with water. If swallowed, Do NOT induce vomiting. Seek medical advice immediately as urgent hospital treatment is likely to be required. For advice, contact a Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766) or a doctor at once. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Most important symptoms and effects, both acute and delayed no data available

Indication of any immediate medical attention and special treatment needed no data available

Other Information:

For advice, contact a Poisons Information Centre (Phone e.g. Australia 13 1126; New Zealand 0800 764 766) or a doctor at once.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire. Use carbon dioxide, dry chemical or water fog. If batteries are involved in a fire and the hazard situation is unclear, only extinguish with dry chemical extinguishers.

Unsuitable extinguishing media: Do not use water or foam extinguishers on ruptured batteries. Do not use Halon type extinguishing agents. Confining or smothering the fire is recommended as reaction of the materials with water may produce flammable and explosive hydrogen gas as well as corrosive hydrogen fluoride gas. Hydrofluoric acid can cause severe chemical burns, is extremely reactive and is toxic by all routes of exposure.

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Special hazards arising from the substance or mixture

Combustion and thermal degradation of the battery may produce hazardous fumes of lithium, hydrofluoric acid, hydrogen and oxides of carbon as well as smoke and irritating vapours.

Advice for firefighters

Special protective equipment for firefighters: Complete suit protecting against chemicals. In the event of a fire, wear full protective clothing and self-contained breathing equipment with full-face piece operated in the pressure demand or other positive pressure mode. Electrolyte leakage or battery container rupture is possible under the conditions experienced in a fire. Keep fire exposed surfaces, etc. cool with water spray. Closed containers may explode, burst, rupture or vent when exposed to high temperatures.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

If the battery housing is damaged, electrolyte can leak. For small spills seal batteries in an airtight plastic bag, having added dry sand, chalk powder (CaCO3) or vermiculite. Traces of electrolyte can be soaked up with dry paper towels. When doing so, prevent direct contact with skin by wearing PVC safety gloves. Thoroughly rinse with water.

If mists or vapours are generated, an approved inorganic vapours and gases/acid gases/particulate respirator is required. For large battery spill scenarios, or in confined spaces, a full chemically resistant body-suit with self-contained breathing apparatus is required. For an incident involving more than one or two modules, only trained personnel should deal with a leaking battery.

Ventilate area to dissipate vapours and extinguish and/or remove all sources of ignition. Never enter a spill area unless you know the vapours have dissipated to make the area safe. Stop the leak if safe to do so. Avoid contact with the spilled material.

For further information, refer to section 8 "Exposure Controls / Personal Protection". Ensure adequate ventilation.

Environmental precautions

In the event of a spill or accidental release, notify the relevant authorities in accordance with all applicable regulations. Do not allow batteries or electrolyte to enter drains, surface water, sewers or watercourses - inform local authorities if this occurs.

Methods and materials for containment and cleaning up

Contain and collect spillage with an inert, non-combustible absorbent material (e.g. sand, silica gel, acid binder, universal binder) and place in a suitable, labelled container for disposal according to local / national regulations.

Emergency information (Transport):

Australian & New Zealand Emergency Response Guide Book (AERG) (2021) Guide No: 147 LITHIUM ION BATTERIES

Reference to other sections

see Sections: 7, 8, 11, 12 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

- Under normal operating conditions where the battery remains intact, it is not hazardous.
- Do not open the battery.
- Do not crush, disassemble, drop or solder.
- Incorrect handling can lead to explosion or fire.
- Protect the battery from rain.

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- Do not immerse in liquids or pressure wash.
- Effectively prevent a short circuit of the battery poles by using suitable insulation. (e.g.: taping the terminals with insulation tape).
- Do NOT use, charge or discharge damaged, defective or deformed batteries.

Conditions for safe storage, including any incompatibilities

Lithium batteries are preferably stored at room temperature and in a dry location (for details, refer to the manufacturer's specifications concerning the storage temperature range); large temperature fluctuations are to be avoided. (For example, do not store in the vicinity of heating elements, do not expose to sunshine for long periods). If substances leak out due to damage or improper handling, be sure to comply with the manufacturer's instructions. This particularly includes the use of personal safety equipment.

Australia: Comply with relevant Commonwealth, State or Territory regulations for storage and transport requirements. Reference should be made to AS/NZS 4681, The storage and handling of class 9 (miscellaneous) dangerous goods and articles.

Specific end use(s): no data available.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National Exposure Standards:

No exposure standards assigned to this specific material or its components by the Safe Work Australia Council (SWAC).

Lithium batteries are articles from which no substance is released when operated, handled and stored in accordance with the manufacturers recommendations.

Engineering Controls:

Ventilation is not necessary under normal conditions. Use with good general ventilation. If mists, vapours or dusts are produced local exhaust ventilation should be used. Extract at emission point.

Personal Protective Equipment (PPE):

Eye protection: Not necessary under normal conditions. Final choice of appropriate eye/face protection will vary according to individual circumstances i.e. methods of handling or engineering controls and according to risk assessments undertaken. Eye protection should conform with Australian/New Zealand Standard AS/NZS 1337.1 Personal eye protection - Eye and face protectors for occupational applications.

Hand Protection: Wear nitrile, neoprene, PVC or natural rubber gloves when handling an open or leaking battery. Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

Skin protection: Not necessary under normal conditions. Choose body protection according to the amount and concentration of the hazardous chemical at the work place. Consideration must be given to both durability as well as permeation resistance. Launder contaminated clothing before reuse. It is advisable that a local supplier of personal protective clothing is consulted regarding the choice of material

Respiratory protection: Not necessary under normal conditions. In the event battery case ruptured inside an enclosed space, use a self-contained breathing apparatus. Breathing apparatus needed only when aerosol or mist is formed. If engineering controls are not effective in controlling airborne exposure then use a respirator with an approved filter if a risk assessment indicates this is necessary. Correct fit is essential to obtain adequate protection. Final choice of appropriate respiratory protection will vary according to individual circumstances i.e. methods of handling or engineering controls and according to risk assessments undertaken. Reference should be made to Australian/New Zealand Standards AS/NZS 1715, Selection, Use and maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices.

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Selection Criteria:

Protective equipment must be chosen according to current AS/NZS standards and in cooperation with the supplier of protective equipment. Personal protective equipment must be defined after risk assessment for the workstation. Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards and/or risks that may occur during use.

Collective emergency equipment:

Personal protective equipment available close by in case of emergency. Emergency equipment, first-aid box with instructions readily available, safety shower and eye fountain for collective emergency.

Workplace Hygiene Measures:

Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material:

- Avoid contact with the skin and the eyes.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Preventive skin protection (protective ointment for the skin)
- Wash contaminated clothing before re-use.

Environmental exposure controls

Do not allow batteries or electrolyte to enter drains, surface water, sewers or watercourses.

9. PHYSICAL AND CHEMICAL PROPERTIES

BATTERY (article) Appearance

:	Manufactured sealed battery unit. Black and white.
Colour :	no data available.
Odour :	Odourless.
Odour Threshold :	no data available.
pH:	Not applicable.
Melting point/freezing point:	no data available.
Initial boiling point and boiling range:	no data available.
Flash Point:	no data available.
Evaporation rate:	no data available.
Flammability (solid, gas):	no data available.
Upper/lower flammability:	no data available.
Vapour Pressure:	no data available.
Vapour density:	no data available.
Relative density:	no data available.
Specific Gravity:	no data available.
Solubility in Water:	no data available.
Solubility in Organic Solvents:	no data available.
Partition coefficient: n-octanol/water:	no data available..
Auto-ignition temperature:	no data available..
Decomposition temperature:	no data available..
Viscosity:	no data available..
Oxidizing Properties:	no data available.

Other information no data available.

10. STABILITY AND REACTIVITY

Reactivity no data available

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Chemical stability

The product is stable when operated, handled and stored in accordance with the manufacturers recommendations.

Possibility of hazardous reactions

Internal battery electrolyte and components can release flammable gases, and generate hazardous hydrogen fluoride, on contact with water. Internal battery components can catch fire spontaneously if exposed to air and oxygen.

Conditions to avoid

- Do not open the battery.
- Do not crush, disassemble, drop or solder.
- Incorrect handling can lead to explosion or fire.
- Protect the battery from rain.
- Do not immerse in liquids or pressure wash
- Effectively prevent a short circuit of the battery poles by using suitable insulation. (e.g.: taping the terminals with insulation tape).
- Do NOT use, charge or discharge damaged, defective or deformed batteries.
- Comply with the voltage limits defined for the battery during discharge and charge. If the limits are exceeded, the battery may burst or even explode.

Incompatible materials

Materials to avoid : Avoid conductive materials, water, seawater, strong oxidizers and strong acids.

Hazardous decomposition products

Exposure to fire may cause emission of flammable and highly toxic gases including CO, CO₂, HF, Phosphorous fluoride.

11. TOXICOLOGICAL INFORMATION

No toxicological data available for this specific product.

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The chemical hazards relate to the released contents (internal electrolyte). Undamaged sealed batteries normally present a low hazard, however damaged batteries may release toxic, harmful and irritating contents. Disassembly, abuse or destruction of battery cell may cause violent explosion with scattering of contents. Heating may cause bursting of contents.

Acute toxicity

The product is stable when operated, handled and stored in accordance with the manufacturers recommendations. Unbroken cells or batteries do not represent a toxicity hazard.

Skin corrosion/irritation and Serious eye damage/irritation:

Risk of thermal or electrical abuse causing cells to rupture. Electrolyte is corrosive and causes chemical burns on contact with skin and eyes. Inhalation of fine mist or vapours is irritating to the respiratory system. Prolonged contact with the skin or mucous membranes may cause irritation.

Respiratory or skin sensitisation:

no data available

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Germ cell mutagenicity: no

data available

Carcinogenicity: no

data available

Reproductive toxicity: no

data available

Specific Target Organ Toxicity (STOT) - single exposure:

no data available

Specific Target Organ Toxicity (STOT) - repeated exposure: no

data available

Aspiration hazard: no

data available

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Not applicable for undamaged product.

Persistence and degradability Not

applicable.

Bioaccumulative potential Not

applicable.

Mobility in soil Not

applicable.

Results of PBT and vPvB assessment Not

applicable.

Other adverse effects

In case of an accident emissions may be harmful to environment.

13. DISPOSAL CONSIDERATIONS

Advice on Disposal: Do not incinerate. Dispose of contents / container in accordance with local regulations. The product should not be allowed to enter drains, water courses or the soil.

Note: The user's attention is drawn to the possible existence of local regulations regarding disposal.

14. TRANSPORT INFORMATION

ADG

UN number: 3480

Proper Shipping Name: LITHIUM ION BATTERIES (including lithium ion polymer batteries)

UN number : 3481

Proper Shipping Name: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or
LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

Class: 9

Subsidiary risk: None allocated

Packing group : None allocated

Hazchem Code: 4W



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IATA

UN number : 3480

Proper Shipping Name: LITHIUM ION BATTERIES (including lithium ion polymer batteries) Class : 9

Packing group : None allocated

Labels : 9

Packing instruction (cargo aircraft): 965

Packing instruction (passenger aircraft): Forbidden

UN number : 3481

Proper Shipping Name: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

Class : 9

Packing group : None allocated

Labels : 9

Packing instruction (cargo aircraft): 967

Packing instruction (passenger aircraft): 967

UN number : 3481

Proper Shipping Name: LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

Class : 9

Packing group : None allocated

Labels : 9

Packing instruction (cargo aircraft): 966

Packing instruction (passenger aircraft): 966

IMDG

UN number : 3480

Proper Shipping Name: LITHIUM ION BATTERIES (including lithium ion polymer batteries) Class : 9

Packing group : None allocated

Labels : 9

EmS Number 1 : F-A

EmS Number 2 : S-I

Marine Pollutant : no

UN number : 3481

Proper Shipping Name: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

Class : 9

Packing group : None allocated

Labels : 9

EmS Number 1 : F-A

EmS Number 2 : S-I

Marine Pollutant : no

Special Precautions for User see

Sections: 6, 7 and 8

NOTE: The above regulatory prescriptions are those valid on the date of publication of this SDS. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office.

15. REGULATORY INFORMATION

Poison Schedule: Not scheduled.

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Inventory **Status** Australia (AICS) Y

Y = All ingredients are on the inventory.

E = All ingredients are on the inventory or exempt from listing.

P = One or more ingredients fall under the polymer exemption or are on the no longer polymer list. All other ingredients are on the inventory or exempt from listing.

N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing.

NOTE:

The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Reasons For Revision:

1) Review against current SWA/GHS criteria and latest information from manufacturer/supplier.

The customer is advised to consult the product Technical Data Sheets for further information including advice on suitable equipment. SDSs are updated frequently. Please ensure that you have a current copy.

Principal References:

Safety Data Sheet – LiFePO4 battery, GSL051200A-B-GBP2 issued by Shenzhen GSL Energy Co., Ltd. Shenzhen, Guangdong, China. Date: 15.12.2022 Report No.: S03A22110902M00801; information supplied by manufacturer; reference sources including the public domain.

END OF SAFETY DATA SHEET

Disclaimer:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.