Safety Data Sheet

RECHARGEABLE LITHIUM-ION BATTERY PB101-07 and PB101-11

REVIEWED: 15 MAY 2024
REPLACES: NEW
DATE PRINTED: 16 May 2024

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**RECHARGEABLE LITHIUM-ION BATTERY PB101-07 and PB101-11**
Chemical name.	$Li(Ni_{0.5}Co_{0.2}Mn_{0.3})O_2$
O**ther names:**	NCM532
Product Code:	HYCROBOTi1 and HYCROBOTi6
Recommended Use of the Chemical and Restrictions on Use:	Battery power for pool cleaning equipment.
Supplier:	HY-CLOR AUSTRALIA PTY LTD
Street Address:	178 Power Street Glendenning NSW 2761
Telephone Number: **After Hours:**	02 8805 2400 0404 859 515
Email:	help@hyclor.com.au
Emergency Telephone:	**131126** Poisons Information Centre – 24 hours **000 (**Dial in case of transport , fire ambulance emergency only**)**

Please ensure you refer to the limitations of this Safety Data Sheet as set out in the "Other Information."

2. HAZARD IDENTIFICATION

The Li-ion batteries described in this Safety Data Sheet are sealed and are not hazardous when used according to the recommendations of the manufacturer.

Under normal conditions of use, electrode materials and liquid electrolyte they contain are non-reactive provided the battery integrity is maintained and seals remain intact, Risk of exposure only in case of abuse, e.g. mechanical, thermal, electrical, which leads to the activation of safety valves and/or the rupture of the battery containers. Electrolyte leakage, electrode materials reaction with moisture/water of battery vent/explosion/fire may follow depending upon circumstances.

Not classified as hazardous according to Safe Work Australia criteria.

Label elements: No signal word, pictograms, hazard or precautionary statements have been allocated.

Other Hazards:

- 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 etc), 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 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. Deep-discharged 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

Ingredient	CAS Number	Concentration (% w/w)
$Li(Ni_{0.5}Co_{0.2}Mn_{0.3})O_2$	182442-95-1	25.9
$LiMNn_2O_4$	12057-17-9	16.9
Polyvinylidene Fluoride (PVDF)	24937-79-9	0.72
CNTS (modified carbon)	16291-96-6	10.75
Aluminium	7429-90-5	4.39
Graphite	7782-42-5	17.1
Super-P (Carbon black)	1333-86-4	0.2
Styrene-butadiene rubber (SBR)	9003-55-8	0.97
Carboxyllmethylcellulose	9000-11-7	0.32
Copper	7440-50-8	8.16
Lithium hexafluorophosphate	21324-40-3	13
Nickel	7440-02-0	0.35
Polypropylene	9003-07-0	0.6
Nylon	24937-16-4	1.25

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre. Phone Australia 13 1126 or a doctor. Have this SDS when you call.

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.

Swallowed: Do not induce vomiting unless advised to do so from, a medical practitioner. Wash out mouth with water and give plenty of water to drink. Seek medical attention.

Skin:	As the battery contains components that are corrosive and cause severe skin burns, after flushing, immediately call a Poisons Information Centre (Phone Australia 131 126; New Zealand 0800 764 766) or doctor/physician. Wash affected area thoroughly with soap and water. Remove contaminated clothing immediately. Wash before reuse or discard. If irritation occurs seek immediate medical attention.
Eye:	If contact with the eye(s) occurs, or if eye irritation arises, wash with copious amounts of water holding eyelid(s) open. Take care not to rinse contaminated water into the non-affected eye. As the battery contains components that are corrosive and cause severe eye burns after flushing, immediately call a Poisons Information Centre (Phone Australia 131 126).
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. If symptoms develop seek medical attention. As the electrolyte is corrosive and with decomposition may cause corrosive and toxic vapours to be released, if the person has inhaled vapours and is having difficulty breathing, immediately call a Poisons Information Centre (Phone Australia 131 126).
Note to Physician	Treat symptomatically

5. FIRE FIGHTING MEASURES

If a fire or emergency occurs – Call Triple Zero (000) immediately if fire or smoke is evident.

Fire or smoke

If your li-ion rechargeable device is on fire, or smoke is coming from it:

- Call Triple Zero (000) immediately and report the incident.
- Don’t touch a damaged battery or device – severe burns could occur.
- Raise the alert and ensure everyone evacuates to a safe area.
- Don’t breathe the air around the battery or device – it will likely contain toxic vapours.

No fire or smoke
If your li-ion rechargeable device is creating an unusual smell or sound, developing heat, changing shape or behaving abnormally, and it is safe to do so:

- Disconnect the device from the power supply.
- Move the device outside away from any other combustible items.
- Submerge the battery in a bucket filled with cool water to prevent ignition or further ignitions, until emergency assistance arrives.

Suitable extinguishing media:	Water, dry sand or a suitable media such as a Class B fire extinguisher: 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 MEDIA: Do not use water or foam extinguishers on ruptured batteries. Do not use a Class D fire extinguisher (dry powder) 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.
Special hazards arising from the chemical:	Combustion thermal degradation of the battery may produce hazardous fumes of lithium oxide, cobalt and manganese, hydrofluoric acid, hydrogen, carbon monoxide, carbon dioxide, and other oxides of carbon as well as smoke and irritating vapours.
Special protective equipment and precautions for fire firefighters:	In the event of fire, wear full protective clothing and self-contained breathing apparatus. 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:
Hazchem Code: **2Y**

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedure	This product is sold in a sealed plastic box, accidental release from one of these is not usually a cause for concern. In the case of contact with the spilled contents wear personal protective equipment as indicated in Section 8.
Environmental precautions	Keep spilt products out of drains, sewers and waterways. If large quantities of this material enter the waterways contact the Environmental Protection Authority, or your local Waste Management Authority.
Methods and materials for containment and cleaning up	For minor spills, seal batteries in an airtight plastic bag, having added dry sand, chalk powder (CaCO3) or vermiculite. and place in garbage. Traces of electrolyte can be soaked up with dry paper towels. See also handling and storage below. For large quantities dispose of at an approved waste management site. Clean up affected area with detergent and water. Collect all contaminated wash water for proper disposal.

7. HANDLING AND STORAGE

Precautions for safe handling	Effectively Do NOT use, charge or discharge damaged, defective or deformed batteries. Do not handle the batteries in a manner that allows terminals to short circuit. Prevent a short circuit of the battery poles by using suitable insulation. (e.g.: taping the terminals with insulation tape). Do not open, disassemble, crush or burn battery. 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 ($CaCO_3$) 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 leaking battery incidents.

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.

In the event of a large 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

Safe storage, including any incompatibilities

Keep out of reach of children. Do not storage the battery haphazardly in a box or drawer where they may ~short-circuit each other or be short-circuited by other metal objects. Store between -10°C and 35°C and 60 ±25% R.H. Do not expose the battery to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials. If the battery Is subject to storage for such a long term as more than 3 months, it is recommended to recharge the battery periodically.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Appropriate Engineering Controls: No engineering controls are required for handling batteries that have not been damaged. Personal protective equipment for damaged batteries should include chemical resistant gloves and safety glasses.

Personal Protective equipment: Personal Protection' is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and Safety. glass with side shields. The selection of PPE is dependent on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Clothing:	Protective Clothing or Equipment: Not necessary under conditions of normal use.
Skin Protection:	Protective Gloves. Not necessary under conditions of normal use.
Eye Protection:	Tightly fitting safety goggles or full-faced shields as appropriate recommended. 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.
Respiratory Protection:	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.
Personal Hygiene:	Always wash hands after handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid blue	**Vapour density:**	No data found
Odour:	Odourless	**Density/Relative density:**	No data found
pH:	Not applicable	**Water solubility:**	Insoluble
Melting point / freezing point:	Not applicable	**Partition coefficient n-octanol/water:**	Not applicable,
Initial boiling point and boiling range:	No data found	**Auto-ignition temperature:**	Not applicable
Flash point:	Not flammable	**Decomposition temperature:**	No data found
Evaporation rate:	No data found	**Viscosity:**	No data found

Flammability:	Not flammable	**Explosive properties:**	Not explosive, but batteries can, react very strongly in combination with fire. This can result in battery components being ejected with considerable force.
Upper/lower flammability limits:	Not flammable	**Oxidising properties:**	None
Vapour pressure:	No data found		

10. STABILITY AND REACTIVITY

Reactivity:	Stable under normal temperatures and pressures.
Chemical Stability:	
Possibility of hazardous reactions:	Toxic Fumes, and may form peroxides.
Conditions to avoid:	Do not heat above 70°C or incinerate, deform, mutilate, crush, disassemble, overcharge, short circuit, expose over a long period to humid conditions.
Incompatible materials:	If leaking, do not allow contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Not relevant for a undamaged sealed battery.

Ruptured battery.
Irritation and corrosion
Risk of thermally or electrically abuse causing cells to rupture. Electrolyte is corrosive. It causes chemical burns on contact with skin. Inhalation of fine mist or vapors is irritating to the respiratory system. Prolonged contact with the skin or mucous membranes may cause irritation.

- Sensitization: No information is available at this time.
- Carcinogenicity: No information is available at this time.
- Reproductive toxicity: No information is available at this time.
- Teratogenicity: No information is available at this time.

● Mutagenicity: No information is available at this time

12. ECOLOGICAL INFORMATION

Not relevant for an undamaged sealed battery.

13. DISPOSAL CONSIDERATIONS

Damaged batteries:

- Li-ion batteries with any sign of damage, that have had water or liquid ingress, or that have been exposed to salt-water should be treated as damaged and highly dangerous.
- Contact your local council urgently to ask how these batteries should be disposed of in your local area.
- Never dispose of damaged li-ion batteries or devices in general household, recycling, public or industrial bins, as damaged li-ion batteries can cause fires.
- Do not put discarded, damaged li-ion batteries or devices in piles.
- Wear personal protective clothing and equipment when handling damaged batteries or devices.
- Be aware of the risks related to damaged li-ion batteries, including electric shock, secondary fire risks, and exposure to toxic, corrosive, and flammable vapours and substances.
- Fire or smoke-damaged batteries should be kept outside in a well-ventilated area and stored 10m from any other dangerous goods or materials that are combustible or flammable.
- Place leaking or damaged (but not overheated or off-gassing) batteries in a clear plastic bag or container.
- If you need to transport damaged lithium-ion batteries or devices refer to the ADG Code for more information on how to package them for transport.

Undamaged batteries

- Never dispose of li-ion batteries or devices in general household or recycling bins.
- Never dispose of li-ion batteries or devices in industrial bins.
- Do not put discarded li-ion batteries or devices in piles.
- Contact your local council for instructions about how to discard or recycle lithium-ion batteries in your area.

- Tape over battery terminals with electrical tape before giving them to a disposal or recycling facility.

14. TRANSPORT INFORMATION

Consult the ADG 7.8 IMDG and ICAO/IATA Codes for all the transport requirements for the specified UN Number.

.	Land Transport (ADG 7.8)	Sea Transport (IMDG)*	Air Transport (ICAO/IATA)*
UN Number AND proper shipping name	3480 LITHIUM ION BATTERIES (including lithium ion polymer batteries) OR 3481 LITHIUM ION BATTERIES CONTAINED in EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	3480 LITHIUM ION BATTERIES (including lithium ion polymer batteries) OR 3481 LITHIUM ION BATTERIES CONTAINED in EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	3480 LITHIUM ION BATTERIES (including lithium ion polymer batteries) OR 3481 LITHIUM ION BATTERIES CONTAINED in EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)
Transport Hazard Class	9	9	9
Packaging Group	Not applicable	Not applicable	Not applicable
Marine Pollutant		No	No

‘* Consult IMDG Code for sea transport and ICAO/IATA Code for air transport provisions and instructions.

Hazchem Code: 2Y

15. REGULATORY INFORMATION

Not regulated in Australia other than as a Dangerous Good.

16.OTHER INFORMATION

ADG	Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.5, 2017.
AS/NZS	Australian Standard/New Zealand Standard
CAS Number:	Unique Chemical Abstracts Service Registry Number.
GHS:	Globally Harmonized System of classification and labelling of chemicals (GHS).
Hazchem Code:	Emergency action code of numbers and letters that provide information to emergency services, especially fire fighters
SDS:	Safety Data Sheet.
UN Number:	United Nations Dangerous Goods Number.

References:
Section 3 taken from product SDS from the manufacturer.
Work Safe Australia Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice (June 2023). The Dangerous Goods Classification complies with the Australian Code for the Transport of Dangerous Goods by Road & Rail Edition 7.8, 2022. Other information from the battery Manufacturer's SDS, battery component SDSs and Queensland Fire and Emergency Services.

Sections Revised: All
Replaces revision: New

Disclaimer
This Safety Data Sheet (SDS) has been prepared in compliance with the Work Safe Australia Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice (June 2023). The information in this SDS should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this

document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Hy-Clor Australia Pty. Limited shall not be held liable for any damage resulting from handling or from contact with the above product.