1. PRODUCT IDENTIFICATION

Product Name	Lithium Iron Phosphate Battery	
Other Names	Lithium-ion batteries (including lithium-ion polymer batteries)	
Recommended Use of the Chemical and Restrictions on Use	Energy storage	
Details of Manufacturer or Importer	Distributed in Australia by: Century Yuasa Batteries 37-65 Cobalt Street Carole Park. QLD. 4300.	Distributed in New Zealand by: Century Yuasa Batteries 259 Church Street Onehunga. Auckland 1061
Emergency Telephone Number	07 3361 61 61	0800 93 93 93

2. HAZARD(S) IDENTIFICATION

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the Model WHS Regulations and the ADG Code.

GHS Classification: Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Dermal) Category 3, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 1A, Corrosive to Metals Category 1, Carcinogenicity – category 2 (Nickel), Specific target organ toxicity (repeated exposure) – category 1 (Nickel)

GHS Label Elements

Signal Word: **DANGER**

IN THE EVENT OF INTERNAL CONTENTS EXPOSED

Hazard Statement(s)	H311	Toxic in contact with skin
	H302	Harmful if swallowed
	H314	Causes severe skin burns and eye damage
	H290	May be corrosive to metals
	H351	Suspected of causing cancer (Nickel)
	H372	Causes damage to organs through prolonged or repeated exposure (Nickel)

IN THE EVENT OF INTERNAL CONTENTS EXPOSED

Precautionary Statement(s) General	P101	If medical advice is needed, have product container or label at hand
	P102	Keep out of reach of children
	P103	Read carefully and follow all instructions
Precautionary Statement(s) Prevention	P201	Obtain special instructions before use
	P202	Do not handle until all safety precautions have been read and understood
	P260	Do not breath dust/fume
	P280	Wear protective gloves/protective clothing/eye protection/face protection
Precautionary Statement(s) Response	P301 + P330 + P331+312	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER or doctor/physician if you feel unwell.
	P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P361	Remove/Take off immediately all contaminated clothing.
	P363	Wash contaminated clothing before reuse.
	P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue Rinsing.
	P310	Immediately call a Poison Centre or doctor/physician.
	P390	Absorb spillage to prevent material damage

Precautionary Statement(s) Storage	P405	Store locked up
Precautionary Statement(s) Disposal	P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	Identification	Content % weight
Lithium Ion Phosphate (LiFePO4)	15365-14-7	12-24
Phosphate(1-),hexafluoro, lithium (LiPF6)	21324-40-3	2
Copper foils (Cu)	7440-50-8	3-8
Graphite ($C_{24}X_{12}$)	7782-42-5	3-6
Aluminium (Al)	7429-90-5	5-10
Nickel (Ni)	7440-02-0	1-3
Iron (Fe)	7439-89-6	14-20
ABS ($C_{15}H_{17}N$)	9003-56-9	3
PC (PC)	25037-45-0	7
Silica (xSiO2.yH2O)	112926-00-8	14
Other	-	6-10

4. FIRST AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

The chemicals in this product are contained in a sealed package. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused.

Eye Contact	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin Contact	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. Immediately contact a Poisons Information Centre or a Doctor.
Symptoms Caused by Exposure	Causes burns to eyes, skin and mucous membranes.
Medical Attention and Special Treatment	No special instructions specified.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Equipment	Water	CO_2	Dry Chemical Powder	Foam	BCF/ Vaporising Liquid	**Class D**	Li-Ion Battery
	✗	✗	✗	✗	✗	✓	✓

Specific Hazards Arising from the Chemical	Product causes burns to eyes, skins and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapours. Hazardous combustion product: carbon diooxide.
Special Protective Equipment and Precautions for Firefighters	Self-contained breathing apparatus and full protective gear.
Hazchem Code	Not available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures	In case of rupture, avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Ise personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Refer to protective measures listed in sections 7 and 8.
Environmental Precautions	Prevent product from contaminating soil and from entering sewers or waterways.
Methods and Materials for Containment and Cleaning Up	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately and dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Precautions for Safe Handling

- 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.

Conditions for Safe Storage

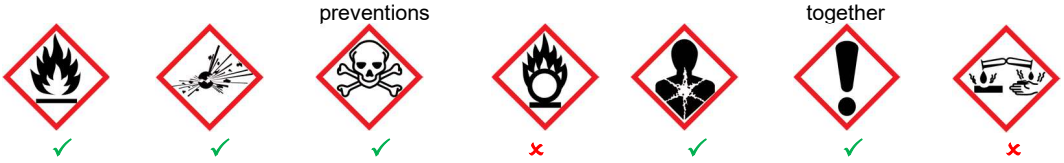
- Store in a cool, dry, well ventilated area away from incompatible substances.
- Store locked up.
- Keep out of reach of children.

Storage Incompatibility

✓= May be stored together

ⓘ= May be stored together with specific preventions

×= Must not be stored together



8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Control Measures - This product presents no health hazards to the user when used according to label directions for its intended purposes

Ingredient	SafeWork Australia WES TWA_{8hr}	WorkSafe New Zealand TWA_{8hr}	ACGIH TLV TWA_{8hr}
Iron Lithium Phosphate (LiFePO4)	-	-	-
Phosphate(1-), hexafluoro,lithium (LiPF6)	-	-	-
Copper (Cu) foil	1 mg/m^3	-	1 mg/m^3
Graphite (C)	3 mg/m^3	3 mg/m^3	2 mg/m^3 (respirable)
Aluminium (Al)	10 mg/m^3	10 mg/m^3	1 mg/m^3 (respirable)
Iron	-	-	-
Nickel	1mg/m^3 (metal)	0.005mg/m^3	0.2mg/m^3
Silica	10mg/m^3 (gel/precipitated)	10mg/m^3 (gel/precipitated)	-

Biological Monitoring: Not required

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Personal Protection

Respirator Type
- Not normally required with normal use.
- In case of battery venting self-contained breathing apparatus.

Eye Protection
- Not normally required with normal use.
- Wear tight sealing safety goggles and face protection shield when handling leaking batteries.

Clothing
- Not normally required with normal use.
- In case of battery leaking, protective clothing.

Foot wear
- Not normally required with normal use.
- In case of battery leaking, safety footwear or safety gumboots (rubber)

Glove Type
- Not normally required with normal use.
- Use butyl rubber gloves when handling leaking batteries.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Prismatic		
Odour	If leaking, smells of medical ether.	**Lower explosive limits**	Not Available
Odour threshold	Not Available	**Vapour pressure (kPa)**	Not Available
pH	Not Applicable	**Vapour density (Air = 1)**	Not Available
Melting point/ freezing point (°C)	Not Available	**Relative density (Water = 1)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Solubility in water (g,L)**	Insoluble
Flash point	Not Applicable	**Partition coefficient: n-octanol/water**	Not Available
Evaporation rate	Not Available	**Auto-ignition temperature**	Not Available
Flammability	Not Available	**Decomposition temperature (°C)**	Not Available
Upper explosive limits	Not Available	**Viscosity**	Not Available

10. STABILITY AND REACTIVITY

Reactivity	Not available	Chemical stability	Product is considered stable under recommended storage conditions
Possibility of hazardous reactions	None under normal process.	Conditions to avoid	Heating, mechanical abuse and electrical abuse.
Incompatible materials		Hazardous decomposition products	Carbon oxides

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11. TOXICOLOGICAL INFORMATION ACUTE EFFECTS

No adverse health effects expected if the product is handled in accordance with this safety data sheet and the product label.

Symptoms or effects that may arise if the product ruptures are:-

Inhaled	Inhalation of vapours or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation
Ingestion	Irritation to the internal/external mouth areas, may occur following exposure to a leaking battery. Seek immediate medical advice. Cells lodged in the oesophagus should be removed immediately since leakage, caustic burns and perforation package occur as soon as two hours after ingestion.
Skin contact	Contact with battery contents may cause irritation
Eye	Vapor fumes may be irritating to the eyes
Chronic effects	Not available

Acute Toxicity	Skin Irritation / Corrosion	Serious Eye Damage / Irritation	Respiratory Or Skin Sensitisation	Mutagenicity	Carcinogenicity	Reproductivity	Stot - Single Exposure	Stot - Repeated Exposure	Aspiration Hazard
✓	✓	✓	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ	ⓘ

✓ = Data required to make classification available ✗ = Data available but does not fill the criteria for classification
ⓘ = Data Not Available to make classification

12. ECOLOGICAL INFORMATION

Degradability	No data available
Bio-accumulative Potential	No data available
Mobility in Soil	No data available
Other Adverse Effects	Do not allow product to reach ground water, water course or sewage system.

13. DISPOSAL CONSIDERATIONS

Safe Handling & Disposal	Recycle in accordance with local regulations. Batteries should not be treated as ordinary trash. Should not be thrown into fire or placed in high temperature. Shouldn't be dissected, pierced, crushed or treated similarly.
Environmental Regulations	Refer to section 15

14. TRANSPORT INFORMATION

REGULATED FOR TRANSPORT OF DANGEROUS GOODS ADG, IATA and IMDG

Labels Required

Land and Sea Transport

Air Transport

Marine Pollutant No
Hazchem Code Not available

Land Transport

UN Number	3480
Proper Shipping Name	Lithium ion batteries (including lithium-ion polymer batteries)
Transport Hazard Class	Class 9 Sub-risk Not Applicable
Packing Group	Not Applicable
Environmental Hazards for Transport Purposes	Not Applicable
Special Precautions for User	Special Provisions 230, 348, 376, 377, 384 Packing Instructions P903, P908, P909, P911, LP903, LP904, LP906

Air Transport

UN Number	3480
Proper Shipping Name	Lithium ion batteries (including lithium-ion polymer batteries)
Transport Hazard Class	Class 9 Sub-risk Not Applicable
Packing Group	Not Applicable
Environmental Hazards for Transport Purposes	Not Applicable
Special Precautions for User	Can be shipped by air in accordance with International Civil Aviation Organisation (ICAO) TI or International Air transport Association (IATA) DGR Packing Instructions (PI) 965 IA, PI966, PI967 Section I.

Sea Transport

UN Number	3480
Proper Shipping Name	Lithium ion batteries (including lithium-ion polymer batteries)
Transport Hazard Class	Class 9 Sub-risk Not Applicable
Packing Group	Not Applicable
Environmental Hazards for Transport Purposes	Not Applicable
Special Precautions for User	EMS Number F-A,S-I Special Provisions 230, 348, 376, 377, 384 Packing Instructions P903, P908, P909, P911, LP903, LP904, LP906 Stowage and Handling Category A, SW19 IMDG Code (Amdt. 39-18) (2018) Edition – including passing of the UN38.3 test.

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15. REGULATORY INFORMATION

Iron Lithium Phosphate	No information available
Phosphate(1-),hexafluoro, lithium	Chemical is registered in the Australian Inventory of Industrial Chemicals
Copper (Cu)	Chemical is registered in the Australian Inventory of Industrial Chemicals
Graphite (C)	Chemical is registered in the Australian Inventory of Industrial Chemicals
Aluminium (Al)	Chemical is registered in the Australian Inventory of Industrial Chemicals
Silica (xSiO2.yH2O)	Chemical is registered in the Australian Inventory of Industrial Chemicals
Nickel (Ni)	Chemical is registered in the Australian Inventory of Industrial Chemicals
ABS ($C_{15}H_{17}N$)	Chemical is registered in the Australian Inventory of Industrial Chemicals
PC (PC)	Chemical is registered in the Australian Inventory of Industrial Chemicals
Iron (Fe)	Chemical is registered in the Australian Inventory of Industrial Chemicals

Batteries are exempt from The Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

16. ANY OTHER RELEVANT INFORMATION

Revision Information 1 **Date** November 2021

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
DSEN	Dermal Sensitiser
STOT	Specific Target Organ Toxicity
TLV	Threshold Limit Value
TWA_{8hr}	Time Weighted Average (8 hour)
WES	Workplace Exposure Standard

References

IATA Lithium Battery Guidance Document (2021)
IMDG Code (incorporating amendment 39-18)
SafeWork Australia Workplace Exposure Standards for Airborne Contaminants (19 December 2019)
WorkSafe New Zealand Workplace exposure standards and biological exposure indices Ed 12-1 (November 2020)
ACGIH Threshold Limit Values https://www.osha.gov/annotated-pels/note (accessed May 2021)