



SAFETY DATA SHEET

SECTION 1 – IDENTIFICATION: PRODUCT IDENTIFIER/CHEMICAL IDENTITY

- 1.1 PRODUCT IDENTIFIER: Stihl AR 1000, AR 3000 Back pack Battery.
- 1.2 PRODUCT CODE: 4865 400 6505, 4865 400 6520.
- 1.3 RELEVANT IDENTIFIED USES OF THE MIXTURE AND USES ADVISED AGAINST:
RELEVANT IDENTIFIED USES: Rechargeable Lithium ion battery for electric power tools.
RESTRICTIONS ON USE: Use only with Stihl cordless power tools.
- 1.4 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET:
- SUPPLIER NAME: Stihl Pty Ltd (ABN: 76 004 881 145),
ADDRESS: 5 Kingston Park Court, Knoxfield, Victoria, Australia, 3180
9 Bishop Browne Place, East Tamaki, Auckland, New Zealand, 1730.
E-MAIL: csc@stihl.com.au; info@stihl.co.nz
- TELEPHONE NUMBER: +61 3 9215 6666 (NZ: +64 9262 4000)
- 1.5 EMERGENCY TEL. NUMBER: Poisons Information Centre (Aust 131 126; NZ 0800 764 766)
- 1.6 HSNO DETAILS:
HSNO APPROVAL NUMBER: Not Applicable.
HSNO GROUP TITLE: Not Applicable.

SECTION 2 – HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE HAZARDOUS CHEMICAL:

GHS CLASSIFICATION HAZARD

- CLASS & CATEGORY: The product is a Lithium ion battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the battery integrity remains, and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused/damaged. If the battery is **compromised and starts to leak**, based upon the battery ingredients, under the Model Work Health and Safety Regulations, the ingredients in the product would be rated as hazardous as per **Section 2.3 Other Hazards***

2.2 LABEL ELEMENTS INCLUDING PRECAUTIONARY STATEMENTS:

No Work Health and Safety labelling is applicable to the battery which is considered an Article. If the battery is **compromised and starts to leak**, based upon the battery ingredients, under the Model Work Health and Safety Regulations, the ingredients in the product would be rated as hazardous and the Label Elements and Precautionary Statements as per **Section 2.3 Other Hazards*** will be applicable.

- SIGNAL WORD: Not Applicable.
PICTOGRAMS: Not Applicable.
HAZARD STATEMENTS: Not Applicable.

PRECAUTIONARY STATEMENTS:

- PREVENTION: Not Applicable.
RESPONSE: Not Applicable.
STORAGE: Not Applicable.
DISPOSAL: Not Applicable.

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SECTION 2 – HAZARD(S) IDENTIFICATION Continued

2.3 OTHER HAZARDS*: The following hazards are associated with the battery if the unit is compromised and the materials escape. They represent the hazards of the contents of the product that are not available under normal conditions of use but may create exposure if the casing of the article is damaged or breached.

GHS CLASSIFICATION HAZARD

CLASS & CATEGORY: Under the Model Work Health and Safety Regulations the product would be rated by calculation as Hazardous:
Acute Toxicity - Oral - Category 3
Skin Corrosion/Irritation - Category 1B
Sensitisation - Skin - Category 1
Sensitisation - Respiratory - Category 1
Carcinogenicity - Category 1A
Toxic to Reproduction - Category 1B
Specific Target Organ Toxicity (Repeated Exposure) - Category 1
Chronic Aquatic Toxicity - Category 1

SIGNAL WORD: Danger.

PICTOGRAMS:



HAZARD STATEMENTS:
H301 - Toxic if swallowed.
H314 - Causes severe skin burns and eye damage.
H317 - May cause an allergic skin reaction.
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350i - May cause cancer by inhalation.
H360f - May damage fertility.
H372 - Causes damage to organs through prolonged or repeated exposure if swallowed or inhaled.
H410 - Very toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:

PREVENTION:
P102 - Keep out of reach of children.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe fume/mist/vapours.
P264 - Wash hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

RESPONSE:

P285 - In case of inadequate ventilation wear respiratory protection.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
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. Continue rinsing.
P308 + P313 - IF exposed or concerned: Get medical advice/attention.
P310 - Immediately call a POISON CENTRE or doctor/physician.
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention.
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician.
P363 - Wash contaminated clothing before reuse.
P390 - Absorb spillage/leaking electrolyte to prevent material damage.
P391 - Collect spillage.

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SECTION 2 – HAZARD(S) IDENTIFICATION Continued

STORAGE: P405 - Store locked up.
 P406 - Store any spilled/leaking electrolyte material in a corrosive resistant container with a resistant inner liner.

DISPOSAL: P501 - Dispose of contents/container in accordance with local regulations.

ADDITIONAL HAZARDS: Lithium-Ion Batteries have a gas tight seal and are safe as long as they are handled in accordance with the manufacturer's specifications. When re-charging batteries, always use chargers which are suitable for the battery type. Do not short-circuit batteries. Do not cause mechanical damage to batteries, by processes such as puncturing, deforming, disassembling, etc. Do not heat them above the permitted temperature (120°C) or burn them. Keep batteries away from small children. Never assume a battery is fully discharged. Batteries can contain a considerable amount of energy, which may be a source of high electric current and lead to severe electrical shock in the event of a short-circuit.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS	CAS NUMBER	Concentration % W/W	GHS Classification*
Manganese Dioxide	1313-13-9	< 30%	Acut Tox 4 - H302 Acut Tox 4 - H332 STOT (RE) 1 - H372
Carbon	7440-44-0	< 30%	Flam Sol 2 - H228
Nickel Oxide	1313-99-1	< 30%	Skin Sen 1 - H317 Carc 1A - H350i STOT (RE) 1 - H372 Chron Aq Tox 4 - H413
Cobalt(II) Oxide	1307-96-6	< 30%	Acut Tox 3 - H301 Skin Sen 1 - H317 Resp Sen 1 - H334 Acut Tox 2 - H330 Repro Tox 1B - H360f STOT (RE) 1 - H372 Chron Aq Tox 1 - H410
Electrolyte Components		<20%	Hazards
<i>Phosphate(1-), hexafluoro-, lithium</i>	21324-40-3		Acut Tox 3 - H301 Skin Corr 1B - H314 STOT (RE) 1 - H372
<i>Dimethyl Carbomate</i>	616-38-6		Flam Liq 2 - H225
<i>Carbomate, Methyl ethyl</i>	623-53-0		Flam Liq 2 - H225
<i>Ethylene Carbomate</i>	96-49-1		Eye Irr 2A - H319
<i>4-Fluoro-1,3-dioxolane-2-one (Fluoroethylene Carbomate)</i>	114435-02-8		Acut Tox 4 - H302 Skin Irrit 2 - H315 Skin Sen 1 - H317 Eye Irr 2A - H319

The product does not contain metallic lithium or lithium alloys.

* Please see Section 15 of this SDS for the full text description of the Label Elements.

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SECTION 4 – FIRST AID MEASURES

4.1 DESCRIPTION OF NECESSARY FIRST AID MEASURES:

The hazardous components of this battery are contained within a sealed unit. The hazardous contents are a corrosive electrolyte (Lithium salts in organic solvents) contained in cells containing Manganese oxide, Nickel oxide and Cobalt (II) oxide. **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/damaged.**

INGESTION: If the contents have been 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.

EYE: If the contents comes into contact with 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 product 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.

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.

INHALATION: 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.

PROTECTION FOR FIRST AIDERS:

No person shall place themselves in a situation that is potentially hazardous to themselves. Due to the corrosive nature of the electrolyte liquid and the potential for toxic and corrosive decomposition vapours when leaking, never enter the area until you have assessed the environment for oxygen depletion and corrosive vapours. Only personnel trained in dealing with corrosive spill scenarios should enter such areas. Do not enter corrosive vapour contaminated areas without Self Contained Breathing Apparatus once you have assessed the atmosphere. As the electrolyte is corrosive, if the person has ingested the electrolyte, DO NOT use direct mouth-to-mouth resuscitation techniques. Always ensure that you are wearing gloves when dealing with first aid procedures involving chemicals and/or blood.

FIRST AID FACILITIES: Eye wash fountain and safety showers or at least a source of running water are required in the area where the product is used.

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SECTION 4 – FIRST AID MEASURES Continued

4.2 MOST IMPORTANT SYMPTOMS & EFFECTS, BOTH ACUTE & DELAYED, CAUSED BY EXPOSURE:

ACUTE:

The contents of the battery are rated as corrosive. Ingestion of the electrolyte could lead to immediate severe gastrointestinal tract irritation with nausea and vomiting and this could lead rapidly to burns. The product is rated as toxic by ingestion. Inhalation of vapours may lead to severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing. The battery components may cause allergy or asthma symptoms or breathing difficulties if inhaled. Eye contact may lead to immediate severe eye irritation or in worst case scenario irreversible damage and possible eye burns. Skin contact with the battery contents may lead to an allergic skin reaction and potentially chemical burns.

CHRONIC:

Skin contact may aggravate/exacerbate existing skin conditions, such as dermatitis. The contents of the battery include skin and respiratory sensitisers. The battery components include Cobalt Oxide which is rated as a may damage fertility and Nickel Oxide which is rated as a carcinogen by inhalation.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NECESSARY:

ADVICE TO DOCTOR:

Treat symptomatically. Please note the corrosive nature of the electrolyte liquid and the potential for toxic and corrosive decomposition products such as hydrofluoric acid when leaking.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA:

SUITABLE 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 MEDIA:

Do not use water or foam extinguishers on ruptured batteries. 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.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:

COMBUSTION HAZARDS:

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

5.3 ADVICE FOR FIREFIGHTERS:

FIRE:

This product is not combustible, however electrolyte leakage or battery container rupture is possible under the conditions experienced in a fire. Keep fire exposed surfaces, etc. cool with water spray.

HAZCHEM CODE:

4W.

EXPLOSION:

Closed containers may explode, burst, rupture or vent when exposed to temperatures above 120°C.

PROTECTIVE EQUIPMENT:

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.

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SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES:

PERSONAL PROTECTION: For small spills where a battery is leaking, wear PVC gloves, glasses/goggles, boots and full-length clothing. Do not walk through the spill. During routine operation a respirator is not required. However, 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. NOTE: For anything other than an incident involving less than a couple of batteries only trained personnel should deal with leaking battery incidents.

CONTROL MEASURES: 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. Caution: The spilled product will be slippery. Avoid contact with the spilled material.

EMERGENCY PROCEDURES: In the event of a spill or accidental release, notify the relevant authorities in accordance with all applicable regulations.

6.2 ENVIRONMENTAL PRECAUTIONS:

SPILL ADVICE: Do not allow batteries or electrolyte to enter drains, surface water, sewers or watercourses - inform local authorities if this occurs.

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP:

CONTAINMENT: Contain the spill and absorb with a proprietary absorbent material, DRY sand or earth or chalk powder (CaCO_3). Caution: The spilled product will be slippery. For large battery spill scenarios prepare a bund/barrier/dyke ahead of the spill to confine the spill and allow later recovery. If there is the possibility of spills to enter drains, surface water, sewers or watercourses ensure bunding, or that drains are covered, to minimise the potential for this to occur.

CLEANING PROCEDURES: Having contained the spill, as mentioned above, collect all material quickly and place used absorbent and spent packaging in suitable plastic containers. Caution: The spilled product will be slippery. Follow local regulations for the disposal of waste. Personnel must wear the appropriate protection as mentioned in Section 6.1 during cleaning procedures. Wash contaminated area and objects with large volumes of detergent and water after spill has been cleared. Rinse the cleaned area with water.

SECTION 7 – HANDLING AND STORAGE, INCLUDING HOW THE CHEMICAL MAY BE SAFELY USED

7.1 PRECAUTIONS FOR SAFE HANDLING:

SAFE HANDLING: Under normal operating conditions where the battery remains intact and is not damaged, it is not hazardous. Do not open the battery, damage it or allow it to fall from a substantial height as this could cause a potential exposure and release of the hazardous contents. Protect battery from short-circuiting as it may lead to an explosion. Protect the battery from rain and do not immerse in liquids as there is a danger of short-circuiting the unit. Protect the battery from fire and excessive heat. Do NOT incinerate the battery as there is a danger of explosion. Do NOT use or charge damaged, defective or deformed batteries. Use only with Stihl power tools and use only Stihl chargers to charge or discharge the battery. Only connect the battery to the tool when it is going to be used. Always remove the battery from the tool for transportation purposes. Never use the battery for any other purpose than for that which it has been designed.

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SECTION 7 – HANDLING AND STORAGE, INCLUDING HOW THE CHEMICAL MAY BE SAFELY USED Continued

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES:

SAFE STORAGE: Store in a dry, well ventilated area away from direct sunlight, oxidising agents including strong acids and foodstuffs. The battery is suitable for use and storage in a relative humidity range of 45 to 85%. Nominated use and storage range is -10°C to +50°C. Optimum preservation of functionality occurs in the range of 10°C to 20°C at a 30% charge state.

INCOMPATIBILITIES: Oxidising substances including strong acids.

SECTION 8 – EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1 EXPOSURE CONTROL MEASURES:

EXPOSURE LIMIT VALUES: Exposure standards are not applicable to the sealed article.

8.2 BIOLOGICAL

MONITORING: No data available.

8.3 CONTROL BANDING: No data available.

8.4 ENGINEERING CONTROLS:

ENGINEERING CONTROLS: Special ventilation is not required when using this product in normal use scenarios. Ventilation is required if there is leakage from the battery.

8.5 INDIVIDUAL PROTECTION MEASURES:

EYE & FACE PROTECTION: Eye protection is not required when handling the battery during normal use. Wear safety glasses/goggles if handling a leaking or ruptured battery. Use eye protection in accordance with AS 1336 and AS 1337.

SKIN (HAND) PROTECTION: Hand protection is not required when handling the battery during normal use. PVC gloves are recommended when dealing with a leaking or ruptured battery.

SKIN (CLOTHING) PROTECTION:

Skin protection is not required when handling the battery during normal use. Wear long sleeved clothing to avoid skin contact if handling a leaking or ruptured battery. Soiled clothing should be washed with detergent prior to re-use.

RESPIRATORY PROTECTION: During routine operation a respirator is not required. However, if dealing with an electrolyte leakage and irritating vapours are generated, an approved half face inorganic vapours and gases/acid gases/particulate respirator is required. Use respirators in accordance with AS 1715 and AS 1716.

THERMAL PROTECTION: Not applicable.

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SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1 PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Manufactured sealed unit.
ODOUR:	Not applicable.
ODOUR THRESHOLD:	Not applicable.
pH @ 20°C:	Not applicable.
MELTING/FREEZING POINT:	Not applicable.
INITIAL BOILING POINT:	Not applicable.
BOILING RANGE (°C):	Not applicable.
FLASHPOINT (°C):	Not applicable.
EVAPORATION RATE:	Not applicable.
FLAMMABILITY LIMITS (%):	Not applicable.
VAPOUR PRESSURE (kPa):	Not applicable.
VAPOUR DENSITY:	Not applicable.
DENSITY (g/mL @ 20°C):	Not applicable.
SOLUBILITY IN WATER(g/L):	Not applicable.
PARTITION COEFFICIENT:	Not applicable.
AUTO-IGNITION TEMP (°C):	Not applicable.
DECOMPOSITION TEMP (°C):	Not applicable.
VISCOSITY (cSt @ 100°C):	Not applicable.
VISCOSITY (cSt @ 40°C):	Not applicable.
FLOW TIME @ 20°C:	Not applicable.

SECTION 10 – STABILITY AND REACTIVITY

10.1 REACTIVITY: The product does not pose any further reactivity hazards other than those listed in the following sub-sections.

10.2 CHEMICAL STABILITY: Stable under recommended storage and handling conditions (see section 7).

10.3 POSSIBILITY OF HAZARDOUS REACTIONS: Keep away from strong oxidising agents, such as strong acids. Reaction of the leaking electrolyte materials with water may produce flammable and explosive hydrogen gas as well as corrosive hydrogen fluoride gas. Hazardous polymerisation does not occur.

10.4 CONDITIONS TO AVOID: Do not incinerate the battery or heat above 120°C. Above this temperature the battery is at risk of bursting. Do not, puncture, deform, mutilate, crush or disassemble the unit as it may lead to leakage of the hazardous electrolyte. Avoid short-circuiting of the unit as it may lead to an explosion. Avoid prolonged exposure to conditions of high humidity. When stored at temperatures above 50°C, the battery may age faster and lose its functionality.

10.5 INCOMPATIBLE MATERIALS: The closed unit should not be exposed to strong oxidising agents, including acids, strong bases, water or moisture.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products are not expected to form during normal storage requirements. See Section 5.2 for Hazardous Combustion products. Please note that in contact with water, the electrolyte may produce Hydrofluoric acid which can cause severe chemical burns, is extremely reactive and is toxic by all routes of exposure.

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SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS:

The hazardous components of the battery are contained within a sealed unit. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the battery integrity remains and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused/damaged. **The following toxicology data is in respect to if the person comes into contact with the contents of the battery.**

11.2 SWALLOWED:

Due to the presence of Cobalt (II) Oxide and Phosphate(1-), hexafluoro-, lithium, the contents of the battery are rated as Toxic if swallowed. The electrolyte contained within the battery is a corrosive liquid. Ingestion of the electrolyte could lead to immediate severe gastrointestinal tract irritation with nausea and vomiting and this could lead rapidly to burns. During normal usage ingestion should not be a means of exposure.

11.3 SKIN CORROSION/ IRRITATION:

Due to the presence of Phosphate(1-), hexafluoro-, lithium, the contents of the battery are rated as Causes severe skin burns. The electrolyte contained within the battery is a corrosive liquid and it is expected that it would cause immediate severe skin irritation before leading rapidly to skin burns if not washed off immediately. Correct handling procedures incorporating appropriate protective clothing and gloves should minimise the risk of skin irritation. People with pre-existing skin conditions, such as dermatitis, should take extreme care so as not to exacerbate the condition.

11.4 SERIOUS EYE DAMAGE/ IRRITATION:

Due to the presence of Phosphate(1-), hexafluoro-, lithium, the contents of the battery are rated as Causes severe eye damage. The electrolyte contained within the battery is a corrosive liquid and it is expected that it would lead to immediate severe eye irritation or in worst case scenario irreversible damage and possible eye burns. Contact may cause corneal burns. Effects may be slow to heal after eye contact. Correct handling procedures incorporating appropriate eye protection should minimise the risk of eye irritation. Eye contact

11.5 RESPIRATORY OR SKIN SENSITISATION:

Due to the presence of Nickel Oxide, Cobalt (II) Oxide and Fluoroethylene carbamate, the contents of the battery are rated as May cause an allergic skin reaction. Due to the presence of Cobalt (II) Oxide, the contents of the battery are rated as May cause allergy or asthma symptoms or breathing difficulties if inhaled. Though inhalation of the Cobalt (II) Oxide would be difficult to achieve during a slow, small leakage scenario.

11.6 GERM CELL MUTAGENICITY:

The contents of the battery are not expected to be mutagenic based on the available data and the known hazards of the components.

11.7 CARCINOGENICITY:

Due to the presence of Nickel Oxide, the contents of the battery are rated as May cause cancer by inhalation. Though inhalation of the Nickel Oxide would be difficult to achieve during a slow, small leakage scenario.

11.8 REPRODUCTIVE TOXICITY:

Due to the presence of Cobalt (II) Oxide, the contents of the battery are rated as May damage fertility.

11.9 SPECIFIC TARGET ORGAN TOXICITY (STOT) - SINGLE EXPOSURE:

The presence of Cobalt (II) Oxide, means that the product would be rated as Fatal if inhaled, however during normal spill scenarios it should not be possible to inhale the Cobalt (II) Oxide. The electrolyte contained within the battery is corrosive and is expected to cause respiratory irritation by inhalation. Inhalation of vapours may lead to severe irritation of the mouth and upper respiratory tract with a burning sensation, pain and inflammation in the nose and throat that quickly progresses to chemical burns. There may also be coughing or difficulty breathing.

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SECTION 11 – TOXICOLOGICAL INFORMATION Continued

11.10 SPECIFIC TARGET ORGAN TOXICITY (STOT) -

REPEATED EXPOSURE: Due to the presence of Maganese Dioxide, Nickel Oxide, Cobalt (II) Oxide and Phosphate(1-), hexafluoro-, lithium, the contents of the battery are rated as Causes damage to organs through prolonged or repeated exposure if swallowed or inhaled. Though inhalation of the Oxide components would be difficult to achieve during a slow, small leakage scenario. During normal usage ingestion of the battery contents should not be a means of exposure.

11.11 ASPIRATION HAZARD: This product is not classified as an aspiration hazard, based on the available data and the known hazards of the components. However, due to the corrosive nature of the contents of the battery if swallowed, do NOT induce vomiting. If vomiting has occurred after ingestion the person should be observed to ensure that aspiration into the lungs has not occurred and assessed for chemical burns to the gastrointestinal and respiratory tracts.

11.12 OTHER INFORMATION: No additional data is available.

SECTION 12 – ECOLOGICAL INFORMATION

12.1 ECOTOXICITY: The following Ecotoxicity data applies:

Cobalt (II) Oxide

LC₅₀ (Oncorhynchus mykiss): 1.5 mg Co/L

EC₅₀ (Marine Water Algae): 24.1 microgram Co/L

LC₅₀ (Ceriodaphnia dubia): 0.61 mg Co/L

The sealed battery does not pose an Ecotoxicity hazard. There is no data available for the contents of the battery, however, Cobalt(II) Oxide has been rated as Very toxic to aquatic life with long lasting effects. Based upon these nominated values, by calculation the contents of the battery in a leakage scenario is expected to be Very toxic to aquatic life with long lasting effects.

12.2 PERSISTENCE &

DEGRADABILITY:

There is no data available for the battery contents.

**12.3 BIOACCUMULATIVE
POTENTIAL:**

There is no data available for the battery contents.

12.4 MOBILITY IN SOIL:

There is no data available for the battery contents.

**12.5 OTHER ADVERSE
EFFECTS:**

There is no data available for the battery contents.

SECTION 13 – DISPOSAL CONSIDERATIONS

13.1 DISPOSAL METHODS:

PRODUCT:

The battery should not be released to the environment, so they should be recycled wherever possible or be disposed of as hazardous waste at an appropriate collection depot. Follow Government regulations for disposal of such waste. Batteries must be taken for recycling or disposal by suitably licensed contractors in accordance with Government regulations. Note: The risks associated with lithium battery recycling include the potential for a fire or explosion if batteries become over-heated, for example if they short-circuit. Used batteries should be stored in their original packaging, a plastic bag or with their terminals/contacts taped, to minimise the potential for short-circuiting to occur. Batteries should be fully discharged before being sent for recycling. Do not store used batteries near heat sources, chemicals or food. Do not store or transport used Lithium batteries with lead acid batteries as they have different regulatory requirements. Do not break open or damage Lithium batteries prior to disposal. Care should be taken at all times to ensure that used batteries are not damaged during storage or transportation.

CONTAINERS:

Not applicable.

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SECTION 14 – TRANSPORT INFORMATION

Lithium batteries are regulated for land, sea and air transportation. It is recommended that Lithium ion batteries should not be fitted to equipment during transportation. **NOTE:** Batteries must always be protected against short-circuiting during transportation. Special precautions should be undertaken when damaged or defective batteries are transported. You must contact the manufacturer before transporting damaged or defective batteries. It is prohibited to carry defective or damaged batteries by air.

14.1 LAND (ADG Code):

UN NUMBER: 3480 or 3481 (When packed with or contained in equipment)

UN PROPER SHIPPING NAME: 3480 - LITHIUM ION BATTERIES (including lithium ion polymer batteries).
3481 - LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries) or
3481 - LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries).

TRANSPORT HAZARD CLASS(ES): 9

PACKAGING GROUP: Not applicable

ENVIRONMENTAL HAZARDS: Not applicable

SPECIAL PROVISIONS FOR USER: 3480 - 188, 230, 310, 348, 376, 377, 384, 387 (Special Packaging Instructions P903, P908, P909, P910, LP903, LP904 apply)
3481 - 188, 230, 310, 348, 360, 376, 377, 384, 387 (Special Packaging Instructions P903, P908, P909, P910, LP903, LP904 apply)

HAZCHEM CODE: 4W

14.2 SEA (IMDG):

UN NUMBER: 3480 or 3481 (When packed with or contained in equipment)

UN PROPER SHIPPING NAME: 3480 - LITHIUM ION BATTERIES (including lithium ion polymer batteries).
3481 - LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries) or
3481 - LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries).

TRANSPORT HAZARD CLASS(ES): 9

PACKAGING GROUP: Not applicable

ENVIRONMENTAL HAZARDS: Not applicable

SPECIAL PROVISIONS FOR USER: 3480 - 188, 230, 310, 348, 376, 377, 384 (Special Packaging Instructions P903, P908, P909, P910, LP903, LP904 apply)
3481 - 188, 230, 310, 348, 360, 376, 377, 384 (Special Packaging Instructions P903, P908, P909, P910, LP903, LP904 apply)

OTHER INFORMATION: EmS: F-A, S-I; Stowage Category A

14.3 AIR (IATA):

UN NUMBER: 3480 or 3481 (When packed with or contained in equipment)

UN PROPER SHIPPING NAME: 3480 - LITHIUM ION BATTERIES.
3481 - LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or
3481 - LITHIUM ION BATTERIES PACKED WITH EQUIPMENT

TRANSPORT HAZARD CLASS(ES): 9

PACKAGING GROUP: Not applicable

ENVIRONMENTAL HAZARDS: Not applicable

SPECIAL PROVISIONS FOR USER: 3480 - A88, A99, A154, A164, A183
3481 (Packed with equipment) - A88, A99, A154, A164, A181, A185
3481 (Contained in equipment) - A48, A99, A154, A164, A181, A185

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SECTION 15 – REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS:

APPLICABLE REGULATIONS:

SUSMP:	Not applicable
AICS:	All ingredients are on the AICS list with the exception of 4-Fluoro-1,3-dioxolane-2-one, (CAS RN: 114435-02-8) which is imported inside a sealed Article and hence does not need to be registered with NICNAS.
MONTREAL PROTOCOL:	Not applicable to this product.
STOCKHOLM CONVENTION:	Not applicable to this product.
ROTTERDAM CONVENTION:	Not applicable to this product.
BASEL CONVENTION:	Not applicable to this product.
INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL):	Not applicable to this product.

OTHER REGULATORY INFORMATION:

GHS CLASSIFICATION HAZARD CLASS & CATEGORY

AND HAZARD STATEMENT: Flammable Liquids Category 2; H225 - Highly flammable liquid and vapour.
Flammable Solid Category 2; H228 - Flammable solid.
Acute Toxicity - Oral Category 3; H301 - Toxic if swallowed.
Acute Toxicity - Oral Category 4; H302 - Harmful if swallowed.
Skin Corrosion/Irritation Category 1B; H314 - Causes severe skin burns and eye damage.
Skin Corrosion/Irritation Category 2; H315 - Causes skin irritation.
Sensitisation - Skin Category 1; H317 - May cause an allergic skin reaction.
Serious Eye Damage/Irritation Category 2A; H319 - Causes serious eye irritation.
Acute Toxicity - Inhalation Category 2; H330 - Fatal if inhaled.
Acute Toxicity - Inhalation Category 4; H332 - Harmful if inhaled.
Sensitisation - Respiratory Category 1; H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Carcinogenicity Category 1A; H350i - May cause cancer by inhalation.
Toxic to Reproduction Category 1B; H360f - May damage fertility.
Specific Target Organ Toxicity (Repeated Exposure) Category 1; H372 - Causes damage to organs through prolonged or repeated exposure if swallowed or inhaled.
Chronic Aquatic Toxicity Category 1; H410 - Very toxic to aquatic life with long lasting effects.
Chronic Aquatic Toxicity Category 4; H413 - May cause long lasting harmful effects to aquatic life.

HSNO APPROVAL NUMBER: Not applicable.

HSNO GROUP TITLE: Not applicable.

SECTION 16 – ANY OTHER RELEVANT INFORMATION

SDS INFORMATION:

Date of SDS Preparation: 2nd November 2018

Revision: 0.0

REVISION CHANGES: Initial preparation of SDS.

ACRONYMS:

SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
CAS Number	Chemical Abstracts Service Registry Number
EINECS	European Inventory of Existing Commercial Chemical Substances
UN Number	United Nations Number
OSHA	Occupational Safety and Health Administration
ACGIH	American Conference of Governmental Industrial Hygienists
HSE-WEL	Health and Safety Executive - Workplace Exposure Limit
EH40	EH40/2005 Workplace Exposure Limits
IMDG	International Maritime Dangerous Goods

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SECTION 16 – ANY OTHER RELEVANT INFORMATION Continued

ACRONYMS Continued:

IATA	International Air Transport Association
IUCLID	International Uniform Chemical Information Database
RTECS	Registry of Toxic Effects of Chemical Substances
%W/W	Percent weight for weight
OECD	Organisation for Economic Co-Operation and Development
ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
HAZCHEM Code	Emergency action code of numbers and letters which gives information to emergency services
NOHSC	National Occupational Health and Safety Commission
NICNAS	National Industrial Chemicals Notification & Assessment Scheme
IMAP	Inventory Multi-Tiered Assessment and Prioritisation
AICS	Australian Inventory of Chemical Substances
TWA	Time-Weighted Average
STEL	Short Term Exposure Limit
HSNO	Hazardous Substances and New Organisms Act 1996
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
WHS	Work Health and Safety PPE Personal Protective Equipment.
LD ₅₀	Median Lethal Dose
LC ₅₀	Median Lethal Concentration
EC ₅₀	Effective Concentration of a substance that causes 50% of the maximum response after exposure for a nominated time
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
ECHA	European Chemicals Agency
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
HCIS	Hazardous Chemical Information System

LITERATURE REFERENCES AND SOURCES OF DATA:

OECD Guidelines for Testing of Chemicals
Annex I: OECD Test Guidelines for Studies Included in SIDS
Manual for the Assessment of Chemicals Chapter 2 Data Gathering
International Toxicity Testing Guidelines
Hazardous Substance Information System - Guidance Material for Hazard Classifications
Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice.
Model Work Health and Safety Regulations.
Model Work Health and Safety Regulations - Transitional Principles
Workplace Exposure Standards for Airborne Contaminants
Australian Dangerous Goods Code 7th Edition
Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004)]
Guidance on the Classification of Hazardous Chemicals under the WHS Regulations
Assigning a Hazardous Substance to a Group Standard
User Guide to the HSNO Thresholds and Classifications
Summary User Guide to the HSNO Thresholds and Classifications of Hazardous Substances
Correlation between GHS and New Zealand HSNO Hazard Classes and Categories
HSNO Control Regulations
Record of Group Standard Assignment
Labelling of Hazardous Substances Hazard and Precautionary Information
Thresholds and Classifications Under the Hazardous Substances and New Organisms Act 1996
Workplace Exposure Standards and Biological Exposure Indices
Handheld Battery Recycling - Guidelines for Lithium Batteries (Australian Battery Recycling Initiative)
Handheld Battery Recycling - Guidelines for Transport (Australian Battery Recycling Initiative)

All information contained in this Safety Data Sheet and the health, safety and environmental information are considered to be accurate to the best of our knowledge as of the issue date specified above. However, no warranty or representation, expressed or implied, is made as to the accuracy or completeness of the data and information contained in this data sheet.

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