

# 12V 1400A PROFESSIONAL JUMP STARTER

Brown & Watson International Pty Ltd

Chemwatch: 5443-59

Version No: 10.1

Safety Data Sheet according to the Health and Safety at Work (Hazardous Substances) Regulations 2017

Chemwatch Hazard Alert Code: 4

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S.GHS.NZL.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	12V 1400A PROFESSIONAL JUMP STARTER
Synonyms	Part Number: IS1400, 12V 900A EMERGENCY JUMP STARTER (Part Number: IS920 & PJ-IS920-2), 12V 1200A EMERGENCY JUMP STARTER (Part Number: IS1220 & PJ-IS1220-2), 12V 1400A PROFESSIONAL JUMP STARTER (Part Number: IS1400 & PJ-IS1400-2), 12/24V 2000A PROFESSIONAL JUMP STARTER (Part Number: IS2000 & PJ-IS2000-2), 12/24V 3000A PROFESSIONAL JUMP STARTER (Part Number: IS3000 & PJ-IS3000-2), 12/24V 5000A PROFESSIONAL JUMP STARTER (Part Number: IS5000 & PJ-IS5000-2), JS900, JS1200, IS1500: 12V/6AH LITHIUM JUMPSTARTER
Proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries) (contains lithium fluorophosphate)
Chemical formula	Not Applicable
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Use according to manufacturer's directions.
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### Details of the manufacturer or supplier of the safety data sheet

Registered company name	Brown & Watson International Pty Ltd	Brown & Watson International NZ Limited
Address	1500 Ferntree Gully Road Knoxfield 3180 VIC Australia	19 Bell Ave Mt Wellington 1060 Auckland New Zealand
Telephone	+61 3 9730 6000	+64 9 525 4575
Fax	Not Available	Not Available
Website	www.narva.com.au & www.projecta.com.au	https://bwinz.co.nz/
Email	info@narva.com.au	sales@nz.brownwatson.com

### Emergency telephone number

Association / Organisation	Australia Poisons Information Centre	NZ National Poisons Centre
Emergency telephone number(s)	13 11 26 (All Hours)	0800 764 766 (0800 POISON)
Other emergency telephone number(s)	Not Available	Not Available

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture


#### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	4	
Body Contact	3	
Reactivity	1	
Chronic	2	

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

Classification <sup>[1]</sup>	Acute Toxicity (Oral) Category 2, Skin Corrosion/Irritation Category 2, Sensitisation (Skin) Category 1, Serious Eye Damage/Eye Irritation Category 2, Acute Toxicity (Inhalation) Category 2, Hazardous to the Aquatic Environment Long-Term Hazard Category 3
Legend:	1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI
Determined by Chemwatch using GHS/HSNO criteria	6.1B (inhalation), 6.1B (oral), 6.3A, 6.4A, 6.5B (contact), 9.1C

### Label elements

Hazard pictogram(s)	
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SIGNAL WORD	DANGER
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Hazard statement(s)

H300	Fatal if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P260	Do not breathe dust/fume.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P273	Avoid release to the environment.
P284	[In case of inadequate ventilation] wear respiratory protection.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330	Rinse mouth.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
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.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
Not Available		Sealed metal containers with electrochemical contents, typically
15365-14-7	28	lithium iron phosphate
7440-50-8	13	copper
7782-42-5	12	graphite
21324-40-3	9	lithium fluorophosphate
96-49-1	9	ethylene carbonate
616-38-6	9	dimethyl carbonate
7429-90-5	7	aluminium
9003-07-0	5	polypropylene
9002-88-4	5	polyethylene
24937-79-9	2	vinylidene fluoride homopolymer
9004-32-4	0.5	sodium carboxymethylcellulose
Not Available		case material as
9003-56-9	100	styrene/ butadiene/ acrylonitrile copolymer

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from CCID EPA NZ; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; \* EU IOELVs available

SECTION 4 FIRST AID MEASURES

## 12V 1400A PROFESSIONAL JUMP STARTER

## Description of first aid measures

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>• Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>• Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>• Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>• Transport to hospital or doctor without delay.</li> <li>• Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> <li>• Generally not applicable.</li> </ul>
<b>Skin Contact</b>	<p>For thermal burns:</p> <ul style="list-style-type: none"> <li>• Decontaminate area around burn.</li> <li>• Consider the use of cold packs and topical antibiotics.</li> </ul> <p>For first-degree burns (affecting top layer of skin)</p> <ul style="list-style-type: none"> <li>• Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides.</li> <li>• Use compresses if running water is not available.</li> <li>• Cover with sterile non-adhesive bandage or clean cloth.</li> <li>• Do NOT apply butter or ointments; this may cause infection.</li> <li>• Give over-the counter pain relievers if pain increases or swelling, redness, fever occur.</li> </ul> <p>For second-degree burns (affecting top two layers of skin)</p> <ul style="list-style-type: none"> <li>• Cool the burn by immerse in cold running water for 10-15 minutes.</li> <li>• Use compresses if running water is not available.</li> <li>• Do NOT apply ice as this may lower body temperature and cause further damage.</li> <li>• Do NOT break blisters or apply butter or ointments; this may cause infection.</li> <li>• Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape.</li> </ul> <p>To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort):</p> <ul style="list-style-type: none"> <li>• Lay the person flat.</li> <li>• Elevate feet about 12 inches.</li> <li>• Elevate burn area above heart level, if possible.</li> <li>• Cover the person with coat or blanket.</li> <li>• Seek medical assistance.</li> </ul> <p>For third-degree burns</p> <p>Seek immediate medical or emergency assistance.</p> <p>In the mean time:</p> <ul style="list-style-type: none"> <li>• Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound.</li> <li>• Separate burned toes and fingers with dry, sterile dressings.</li> <li>• Do not soak burn in water or apply ointments or butter; this may cause infection.</li> <li>• To prevent shock see above.</li> <li>• For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway.</li> <li>• Have a person with a facial burn sit up.</li> <li>• Check pulse and breathing to monitor for shock until emergency help arrives.</li> <li>• Generally not applicable.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>• Generally not applicable.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>• Generally not applicable.</li> </ul>

## Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

for phosphate salts intoxication:

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus, not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.
- Treatment should take into consideration both anionic and cation portion of the molecule.
- All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

Treat symptomatically.

for copper intoxication:

- Unless extensive vomiting has occurred empty the stomach by lavage with water, milk, sodium bicarbonate solution or a 0.1% solution of potassium ferrocyanide (the resulting copper ferrocyanide is insoluble).
- Administer egg white and other demulcents.
- Maintain electrolyte and fluid balances.
- Morphine or meperidine (Demerol) may be necessary for control of pain.
- If symptoms persist or intensify (especially circulatory collapse or cerebral disturbances, try BAL intramuscularly or penicillamine in accordance with the supplier's recommendations.
- Treat shock vigorously with blood transfusions and perhaps vasopressor amines.
- If intravascular haemolysis becomes evident protect the kidneys by maintaining a diuresis with mannitol and perhaps by alkalising the urine with sodium bicarbonate.
- It is unlikely that methylene blue would be effective against the occasional methaemoglobinemia and it might exacerbate the subsequent haemolytic episode.
- Institute measures for impending renal and hepatic failure.

[GOSSELIN, SMITH & HODGE: Commercial Toxicology of Commercial Products]

- A role for activated charcoals for emesis is, as yet, unproven.
- In severe poisoning CaNa2EDTA has been proposed.

[ELLENHORN & BARCELOUX: Medical Toxicology]

Clinical effects of lithium intoxication appear to relate to duration of exposure as well as to level.

- Lithium produces a generalised slowing of the electroencephalogram; the anion gap may increase in severe cases.
- Emesis (or lavage if the patient is obtunded or convulsing) is indicated for ingestions exceeding 40 mg (Li)/Kg.
- Overdose may delay absorption; decontamination measures may be more effective several hours after cathartics.
- Charcoal is not useful. No clinical data are available to guide the administration of catharsis.
- Haemodialysis significantly increases lithium clearance; indications for haemodialysis include patients with serum levels above 4 meq/L.
- There are no antidotes.

[Ellenhorn and Barceloux: Medical Toxicology]

For acute or short term repeated exposures to ethylene glycol:

- Early treatment of ingestion is important. Ensure emesis is satisfactory.
- Test and correct for metabolic acidosis and hypocalcaemia.
- Apply sustained diuresis when possible with hypertonic mannitol.
- Evaluate renal status and begin haemodialysis if indicated. [I.L.O.]

- Rapid absorption is an indication that emesis or lavage is effective only in the first few hours. Cathartics and charcoal are generally not effective.
- Correct acidosis, fluid/electrolyte balance and respiratory depression in the usual manner. Systemic acidosis (below 7.2) can be treated with intravenous sodium bicarbonate solution.
- Ethanol therapy prolongs the half-life of ethylene glycol and reduces the formation of toxic metabolites.
- Pyridoxine and thiamine are cofactors for ethylene glycol metabolism and should be given (50 to 100 mg respectively) intramuscularly, four times per day for 2 days.
- Magnesium is also a cofactor and should be replenished. The status of 4-methylpyrazole, in the treatment regime, is still uncertain. For clearance of the material and its metabolites, haemodialysis is much superior to peritoneal dialysis.

[Ellenhorn and Barceloux: Medical Toxicology]

It has been suggested that there is a need for establishing a new biological exposure limit before a workshift that is clearly below 100 mmol ethoxy-acetic acids per mole creatinine in morning urine of people occupationally exposed to ethylene glycol ethers. This arises from the finding that an increase in urinary stones may be associated with such exposures.

Laitinen J., et al: *Occupational & Environmental Medicine* 1996; 53, 595-600

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

Metal dust fires need to be smothered with sand, inert dry powders.

**DO NOT USE WATER, CO2 or FOAM.**

- Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.
- Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.
- Chemical reaction with CO2 may produce flammable and explosive methane.
- If impossible to extinguish, withdraw, protect surroundings and allow fire to burn itself out.
- **DO NOT** use halogenated fire extinguishing agents.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	<ul style="list-style-type: none"> <li>• Reacts with acids producing flammable / explosive hydrogen (H2) gas</li> <li>• Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result</li> <li>• Keep dry</li> <li>• <b>NOTE:</b> May develop pressure in containers; open carefully. Vent periodically.</li> </ul>
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### Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>• Alert Fire Brigade and tell them location and nature of hazard.</li> <li>• Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>• Prevent, by any means available, spillage from entering drains or water courses.</li> <li>• Use fire fighting procedures suitable for surrounding area.</li> <li>• <b>DO NOT</b> approach containers suspected to be hot.</li> <li>• Cool fire exposed containers with water spray from a protected location.</li> <li>• If safe to do so, remove containers from path of fire.</li> <li>• Equipment should be thoroughly decontaminated after use.</li> </ul> <p>Slight hazard when exposed to heat, flame and oxidisers.</p>
<b>Fire/Explosion Hazard</b>	<p>Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place.</p> <p>Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard.</p> <p>Decomposes on heating and produces:</p> <p>carbon dioxide (CO2) hydrogen fluoride nitrogen oxides (NOx) phosphorus oxides (POx) metal oxides other pyrolysis products typical of burning organic material.</p>

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>• Clean up all spills immediately.</li> <li>• Secure load if safe to do so.</li> <li>• Bundle/collect recoverable product.</li> <li>• Collect remaining material in containers with covers for disposal.</li> </ul>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>• Clear area of personnel and move upwind.</li> <li>• Alert Fire Brigade and tell them location and nature of hazard.</li> <li>• Wear breathing apparatus plus protective gloves.</li> <li>• Prevent, by any means available, spillage from entering drains or water course.</li> <li>• Stop leak if safe to do so.</li> <li>• Contain spill with sand, earth or vermiculite.</li> <li>• Collect recoverable product into labelled containers for recycling.</li> <li>• Neutralise/decontaminate residue (see Section 13 for specific agent).</li> <li>• Collect solid residues and seal in labelled drums for disposal.</li> <li>• Wash area and prevent runoff into drains.</li> <li>• After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.</li> <li>• If contamination of drains or waterways occurs, advise emergency services.</li> <li>• Do not use compressed air to remove metal dusts from floors, beams or equipment</li> </ul>

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## 12V 1400A PROFESSIONAL JUMP STARTER

- Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.
  - Use non-sparking handling equipment, tools and natural bristle brushes.
  - Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations
  - Cover and reseal partially empty containers.
  - Do not allow chips, fines or dusts to contact water, particularly in enclosed areas.
- If molten:
- Contain the flow using dry sand or salt flux as a dam.
  - All tooling (e.g., shovels or hand tools) and containers which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use.
  - Allow the spill to cool before remelting scrap.
  - Clean up all spills immediately.
  - Wear protective clothing, safety glasses, dust mask, gloves.
  - Secure load if safe to do so. Bundle/collect recoverable product.
  - Use dry clean up procedures and avoid generating dust.
  - Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).
  - Water may be used to prevent dusting.
  - Collect remaining material in containers with covers for disposal.
  - Flush spill area with water.

## Minor hazard.

- Clear area of personnel.
- Alert Fire Brigade and tell them location and nature of hazard.
- Control personal contact with the substance, by using protective equipment as required.
- Prevent spillage from entering drains or water ways.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal.
- Wash area and prevent runoff into drains or waterways.
- If contamination of drains or waterways occurs, advise emergency services.

## Reference to other sections

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

## Precautions for safe handling

## Safe handling

Polyalpaolefin (PAO) dimers require bonding and grounding to prevent static hazards which could cause a fire

**NOTE:**

- Wet, activated carbon removes oxygen from the air thus producing a severe hazard to workers inside carbon vessels and in enclosed or confined spaces where activated carbons might accumulate.
- Before entry to such areas, sampling and test procedures for low oxygen levels should be undertaken; control conditions should be established to ensure the availability of adequate oxygen supply.

## For molten metals:

· Molten metal and water can be an explosive combination. The risk is greatest when there is sufficient molten metal to entrap or seal off water. Water and other forms of contamination on or contained in scrap or remelt ingot are known to have caused explosions in melting operations. While the products may have minimal surface roughness and internal voids, there remains the possibility of moisture contamination or entrapment. If confined, even a few drops can lead to violent explosions.

· All tooling, containers, molds and ladles, which come in contact with molten metal must be preheated or specially coated, rust free and approved for such use.

· Any surfaces that may contact molten metal (e.g. concrete) should be specially coated

· Drops of molten metal in water (e.g. from plasma arc cutting), while not normally an explosion hazard, can generate enough flammable hydrogen gas to present an explosion hazard. Vigorous circulation of the water and removal of the particles minimise the hazard.

During melting operations, the following minimum guidelines should be observed:

· Inspect all materials prior to furnace charging and completely remove surface contamination such as water, ice, snow, deposits of grease and oil or other surface contamination resulting from weather exposure, shipment, or storage.

· Store materials in dry, heated areas with any cracks or cavities pointed downwards.

· Preheat and dry large objects adequately before charging in to a furnace containing molten metal. This is typically done by the use of a drying oven or homogenising furnace. The dry cycle should bring the metal temperature of the coldest item of the batch to 200 degree C (400 deg F) and then hold at that temperature for 6 hours.

· Electrostatic discharge may be generated during pumping - this may result in fire.

· Ensure electrical continuity by bonding and grounding (earthing) all equipment.

· Restrict line velocity during pumping in order to avoid generation of electrostatic discharge ( $\leq 1$  m/sec until fill pipe submerged to twice its diameter, then  $\leq 7$  m/sec).

· Avoid splash filling.

· Do NOT use compressed air for filling discharging or handling operations.

· Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes.

· Wait 30 minutes after tank filling ( for large storage tanks)

· before opening hatches or manholes. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to

· accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling

· operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are

· not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and

· containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may


· lead to static discharge e.g. spark formation. Restrict line


· velocity during pumping in order to avoid generation of electrostatic discharge ( $\approx 1$  m/s until fill pipe submerged to


	<ul style="list-style-type: none"><li>· twice its diameter, then = 7 m/s). Avoid splash filling.</li><li>· Do NOT use compressed air for filling, discharging, or handling operations<ul style="list-style-type: none"><li>• Avoid all personal contact, including inhalation.</li><li>• Wear protective clothing when risk of exposure occurs.</li><li>• Use in a well-ventilated area.</li><li>• Prevent concentration in hollows and sumps.</li><li>• <b>DO NOT enter confined spaces until atmosphere has been checked.</b></li><li>• <b>DO NOT allow material to contact humans, exposed food or food utensils.</b></li></ul></li><li>• Avoid contact with incompatible materials.</li><li>• <b>When handling, DO NOT eat, drink or smoke.</b></li><li>• Keep containers securely sealed when not in use.</li><li>• Avoid physical damage to containers.</li><li>• Always wash hands with soap and water after handling.</li><li>• Work clothes should be laundered separately. Launder contaminated clothing before re-use.</li><li>• Use good occupational work practice.</li><li>• Observe manufacturer's storage and handling recommendations contained within this SDS.</li><li>• Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</li></ul>
Other information	<ul style="list-style-type: none"><li>• Store in original containers.</li><li>• Keep containers securely sealed.</li><li>• Store in a cool, dry, well-ventilated area.</li><li>• Store away from incompatible materials and foodstuff containers.</li><li>• Protect containers against physical damage and check regularly for leaks.</li><li>• Observe manufacturer's storage and handling recommendations contained within this SDS.</li><li>• Store away from incompatible materials.</li></ul>


Conditions for safe storage, including any incompatibilities


Suitable container	Generally packaging as originally supplied with the article or manufactured item is sufficient to protect against physical hazards. If repackaging is required ensure the article is intact and does not show signs of wear. As far as is practicably possible, reuse the original packaging or something providing a similar level of protection to both the article and the handler.
Storage incompatibility	<ul style="list-style-type: none"><li>• Keep dry</li><li>• <b>NOTE:</b> May develop pressure in containers; open carefully. Vent periodically.</li></ul>


  
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– Must not be stored together

○ – May be stored together with specific preventions

– May be stored together

Note: Depending on other risk factors, compatibility assessment based on the table above may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
New Zealand Workplace Exposure Standards (WES)	lithium iron phosphate	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	lithium iron phosphate	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	lithium iron phosphate	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	copper	Copper and its inorganic compounds, as Cu respirable dust	0.01 mg/m3	Not Available	Not Available	(dsen) - Dermal sensitiser
New Zealand Workplace Exposure Standards (WES)	copper	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	copper	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	copper	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	graphite	Graphite, all forms except graphite fibres respirable dust	3 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational	graphite	BOEL	Not Available	Not Available	Not Available	Not Available

Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)						
New Zealand Workplace Exposure Standards (WES)	lithium fluorophosphate	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	lithium fluorophosphate	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	lithium fluorophosphate	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	aluminium	Aluminium metal and insoluble aluminium compounds (including pyro powder, aluminium oxide, and aluminium welding fumes), as Al respirable dust	1 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	aluminium	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	aluminium	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	aluminium	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	polypropylene	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	polypropylene	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	polypropylene	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	polyethylene	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	polyethylene	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	polyethylene	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	vinylidene fluoride homopolymer	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	vinylidene fluoride homopolymer	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	vinylidene fluoride homopolymer	BOEL	Not Available	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	styrene/ butadiene/ acrylonitrile copolymer	Respirable dust (not otherwise classified)	3 mg/m3	Not Available	Not Available	Not Available
New Zealand Workplace Exposure Standards (WES)	styrene/ butadiene/ acrylonitrile copolymer	Inhalable dust (not otherwise classified)	10 mg/m3	Not Available	Not Available	Not Available
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)	styrene/ butadiene/ acrylonitrile copolymer	BOEL	Not Available	Not Available	Not Available	Not Available

EMERGENCY LIMITS			
Ingredient	TEEL-1	TEEL-2	TEEL-3
copper	3 mg/m3	33 mg/m3	200 mg/m3
graphite	6 mg/m3	330 mg/m3	2,000 mg/m3
lithium fluorophosphate	7.5 mg/m3	83 mg/m3	500 mg/m3
ethylene carbonate	30 mg/m3	330 mg/m3	2,000 mg/m3
dimethyl carbonate	11 ppm	120 ppm	700 ppm
polypropylene	5.2 mg/m3	58 mg/m3	350 mg/m3
polyethylene	16 mg/m3	170 mg/m3	1,000 mg/m3



Ingredient	Original IDLH	Revised IDLH
lithium iron phosphate	Not Available	Not Available
copper	100 mg/m3	Not Available
graphite	1,250 mg/m3	Not Available
lithium fluorophosphate	Not Available	Not Available
ethylene carbonate	Not Available	Not Available
dimethyl carbonate	Not Available	Not Available
aluminium	Not Available	Not Available
polypropylene	Not Available	Not Available
polyethylene	Not Available	Not Available
vinylidene fluoride homopolymer	Not Available	Not Available
sodium carboxymethylcellulose	Not Available	Not Available
styrene/ butadiene/ acrylonitrile copolymer	Not Available	Not Available





OCCUPATIONAL EXPOSURE BANDING

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
ethylene carbonate	E	≤ 0.01 mg/m³
Notes:	Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.	

Exposure controls

Appropriate engineering controls	Articles or manufactured items, in their original condition, generally don't require engineering controls during handling or in normal use. Exceptions may arise following extensive use and subsequent wear, during recycling or disposal operations where substances, found in the article, may be released to the environment.	
	Metal dusts must be collected at the source of generation as they are potentially explosive.	
	<ul style="list-style-type: none"><li>Avoid ignition sources.</li><li>Good housekeeping practices must be maintained.</li><li>Dust accumulation on the floor, ledges and beams can present a risk of ignition, flame propagation and secondary explosions.</li><li>Do not use compressed air to remove settled materials from floors, beams or equipment</li><li>Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.</li><li>Use non-sparking handling equipment, tools and natural bristle brushes. Cover and reseal partially empty containers. Provide grounding and bonding where necessary to prevent accumulation of static charges during metal dust handling and transfer operations.</li><li>Do not allow chips, fines or dusts to contact water, particularly in enclosed areas.</li><li>Metal spraying and blasting should, where possible, be conducted in separate rooms. This minimises the risk of supplying oxygen, in the form of metal oxides, to potentially reactive finely divided metals such as aluminium, zinc, magnesium or titanium.</li><li>Work-shops designed for metal spraying should possess smooth walls and a minimum of obstructions, such as ledges, on which dust accumulation is possible.</li><li>Wet scrubbers are preferable to dry dust collectors.</li><li>Bag or filter-type collectors should be sited outside the workrooms and be fitted with explosion relief doors.</li><li>Cyclones should be protected against entry of moisture as reactive metal dusts are capable of spontaneous combustion in humid or partially wetted states.</li><li>Local exhaust systems must be designed to provide a minimum capture velocity at the fume source, away from the worker, of 0.5 metre/sec.</li><li>Local ventilation and vacuum systems must be designed to handle explosive dusts. Dry vacuum and electrostatic precipitators must not be used, unless specifically approved for use with flammable/ explosive dusts.</li></ul>	
	Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.	
	Type of Contaminant:	Air Speed:
	welding, brazing fumes (released at relatively low velocity into moderately still air)	0.5-1.0 m/s (100-200 f/min.)
	Within each range the appropriate value depends on:	
	Lower end of the range	Upper end of the range
	1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
	2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
	3: Intermittent, low production.	3: High production, heavy use
	4: Large hood or large air mass in motion	4: Small hood-local control only
	Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2.5 m/s (200-500 f/min.) for extraction of gases discharged 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.	
	Exhaust ventilation should be designed to prevent accumulation and recirculation in the workplace and safely remove carbon black from the air.	
	Note: Wet, activated carbon removes oxygen from the air and thus presents a severe hazard to workers inside carbon vessels and enclosed or confined spaces. Before entering such areas sampling and test procedures for low oxygen levels should be undertaken and control conditions set up to ensure ample oxygen availability.[Linde]	



Individual protection measures, such as personal protective equipment	   
Eye and face protection	No special equipment required due to the physical form of the product.
Skin protection	See Hand protection below
Hands/feet protection	No special equipment required due to the physical form of the product.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"><li>· During repair or maintenance activities the potential exists for exposures to toxic metal particulate in excess of the occupational standards. Under these circumstances, protecting workers can require the use of specific work practices or procedures involving the combined use of ventilation, wet and vacuum cleaning methods, respiratory protection, decontamination, special protective clothing, and when necessary, restricted work zones.</li><li>· Protective over-garments or work clothing must be worn by persons who may become contaminated with particulate during activities such as machining, furnace rebuilding, air cleaning equipment filter changes, maintenance, furnace tending, etc. Contaminated work clothing and over-garments must be managed in a controlled manner to prevent secondary exposure to workers of third parties, to prevent the spread of particulate to other areas, and to prevent particulate from being taken home by workers.</li><li>· Personnel who handle and work with <u>molten metal</u> should utilise primary protective clothing like polycarbonate face shields, fire resistant tapper's jackets, neck shades (snoods), leggings, spats and similar equipment to prevent burn injuries. In addition to primary protection, secondary or day-to-day work clothing that is fire resistant and sheds metal splash is recommended for use with molten metal. Synthetic materials should never be worn even as secondary clothing (undergarments).</li></ul>

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A-AUS P2	-	A-PAPR-AUS / Class 1 P2
up to 50 x ES	-	A-AUS / Class 1 P2	-
up to 100 x ES	-	A-2 P2	A-PAPR-2 P2 ^

^ - Full-face  
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

Respiratory protection not normally required due to the physical form of the product.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Not Available		
Physical State	Manufactured	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Applicable
pH (as supplied)	Not Applicable	Decomposition temperature (°C)	Not Applicable
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Applicable	Gas group	Not Available
Solubility in water	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available
Heat of Combustion (kJ/g)	Not Available	Ignition Distance (cm)	Not Available
Flame Height (cm)	Not Available	Flame Duration (s)	Not Available
Enclosed Space Ignition Time Equivalent (s/m3)	Not Available	Enclosed Space Ignition Deflagration Density (g/m3)	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
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Continued...

Chemical stability	<ul style="list-style-type: none"><li>Unstable in the presence of incompatible materials.</li><li>Product is considered stable.</li><li>Hazardous polymerisation will not occur.</li></ul>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	<p>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.</p> <p>Exposure to toxic levels of butadiene may cause dry nose, mouth and throat, also, fatigue, headache, falling sensation, nausea, respiratory paralysis, central nervous system depression, loss of consciousness and even death. Liver and kidney damage as well as genetic damage may occur.</p> <p>Impurities found in carbons, including iodine, can be toxic. Carbon dusts in the air may cause irritation of the mucous membranes, eyes and skin.</p> <p>Copper poisoning following exposure to copper dusts and fume may result in headache, cold sweat and weak pulse. Capillary, kidney, liver and brain damage are the longer term manifestations of such poisoning. Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever". Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours following removal from exposure.</p> <p>Considered an unlikely route of entry in commercial/industrial environments</p> <p>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.</p>	
Ingestion	<p>Considered an unlikely route of entry in commercial/industrial environments</p> <p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion.</p>	
Skin Contact	<p>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.</p> <p>Irritation and skin reactions are possible with sensitive skin</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>Considered an unlikely route of entry in commercial/industrial environments The material can produce severe chemical burns following direct contact with the skin.</p>	
Eye	<p>If applied to the eyes, this material causes severe eye damage. Considered an unlikely route of entry in commercial/industrial environments</p> <p>The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.</p>	
Chronic	<p>Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.</p> <p>Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems.</p> <p>Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.</p> <p>There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.</p> <p>Exposure to large doses of aluminium has been connected with the degenerative brain disease Alzheimer's Disease.</p> <p>Prolonged or repeated inhalation of dust may cause lung disease. Graphite workers have reported symptoms of headaches, coughing, depression, low appetite, difficult breathing and black sputum. Workers suffering from this have generally worked in the industry for long periods, (10 years or more), although some cases have been reported after as little as four years.</p> <p>Lithium compounds can affect the nervous system and muscle. This can cause tremor, inco-ordination, spastic jerks and very brisk reflexes.</p> <p>There is insufficient evidence to suggest that exposure to carbon black causes increased susceptibility to cancer or other ill effects. Some lung changes can occur after a prolonged period of exposure as well as increased strain on the right side of the heart.</p> <p>For copper and its compounds (typically copper chloride):</p> <p>Acute toxicity: There are no reliable acute oral toxicity results available. Animal testing shows that skin in exposure to copper may lead to hardness of the skin, scar formation, exudation and reddish changes. Inflammation, irritation and injury of the skin were noted.</p> <p>Repeat dose toxicity: Animal testing shows that very high levels of copper monochloride may cause anaemia.</p> <p>Genetic toxicity: Copper monochloride does not appear to cause mutations in vivo, although chromosomal aberrations were seen at very high concentrations in vitro.</p> <p>Cancer-causing potential: There was insufficient information to evaluate the cancer-causing activity of copper monochloride.</p> <p>Occupational exposure to 1,3-butadiene, enhanced or caused cancer at different body sites with significant associated mortality, in animal testing and on the basis of human data. The predominant tumours are lymphomas, cancers of the testes, stomach and intestines, breast, thyroid, pancreas, throat and womb.</p> <p>Sodium phosphate dibasic can cause stones in the kidney, loss of mineral from the bones and loss of thyroid gland function.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>Chronic excessive intake of iron have been associated with damage to the liver and pancreas. People with a genetic disposition to poor control over iron are at an increased risk.</p>	
12V 1400A PROFESSIONAL JUMP STARTER	TOXICITY	IRRITATION
	Not Available	Not Available
lithium iron phosphate	TOXICITY	IRRITATION
	dermal (rat) LD50: 2000 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>

	Inhalation (Rat) LC50: >3.2 mg/l4h <sup>[1]</sup> Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
copper	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Inhalation (Rat) LC50: 0.733 mg/l4h <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
	Oral (Mouse) LD50; 0.7 mg/kg <sup>[2]</sup>	
graphite	TOXICITY	IRRITATION
	Inhalation (Rat) LC50: >2 mg/L4h <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Oral (Rat) LD50; >200 mg/kg <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
lithium fluorophosphate	TOXICITY	IRRITATION
	Oral (Rat) LD50; 50-300 mg/kg <sup>[1]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup> Skin: adverse effect observed (corrosive) <sup>[1]</sup>
ethylene carbonate	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Eye (rabbit): 20 mg - mild [CCInfo]*
	Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup> Skin (rabbit): 660 mg - moderate
		Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
dimethyl carbonate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Inhalation (Rat) LC50: >5.36 mg/l4h <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
	Oral (Rat) LD50; >5000 mg/kg <sup>[1]</sup>	
aluminium	TOXICITY	IRRITATION
	Inhalation (Rat) LC50: >2.3 mg/l4h <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
polypropylene	TOXICITY	IRRITATION
	Oral (Mouse) LD50; 3200 mg/kg <sup>[2]</sup>	Not Available
polyethylene	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg <sup>[1]</sup>	Not Available
	Oral (Rat) LD50; >2000 mg/kg <sup>[1]</sup>	
vinylidene fluoride homopolymer	TOXICITY	IRRITATION
	Not Available	Not Available
sodium carboxymethylcellulose	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg <sup>[2]</sup>	Not Available
	Inhalation (Rat) LC50: >5.8 mg/L4h <sup>[2]</sup>	
	Oral (Guinea) LD50; 16000 mg/kg <sup>[2]</sup>	
styrene/ butadiene/ acrylonitrile copolymer	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 5010 mg/kg <sup>[2]</sup>	Not Available
	Oral (Rat) LD50; 5010 mg/kg <sup>[2]</sup>	
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	
lithium iron phosphate	Goitrogenic: Goitrogens are substances that suppress the function of the thyroid gland by interfering with iodine uptake, which can, as a result, cause an enlargement of the thyroid (a goitre). Goitrogens include: - Vitexin, a flavonoid, which inhibits thyroid peroxidase, contributing to goitre - Thiocyanate and perchlorate, which decrease iodide uptake by competitive inhibition and consequently increase release of TSH from the pituitary gland - Lithium, which inhibits thyroid hormone release - Certain foods, such as soy and millet (containing vitexins) and vegetables in the genus Brassica (which includes broccoli, Brussels sprouts, cabbage, cauliflower and horseradish). - Caffeine (found in coffee, tea, cola and chocolate), which acts on thyroid function as a suppressant.	
	* For pyrolyzate	
	Ultrafine particles (UFPs) may be produced at lower temperatures during the 3D printing process Concerns have been raised regarding	

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acrylonitrile copolymer	<p>airborne UFP concentrations generated while printing with ABS, as UFPs have been linked with adverse health effects</p> <p><b>WARNING:</b> Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. Symptoms are tiredness, influenza like respiratory tract irritation with fever.</p> <p>The following information refers to contact allergens as a group and may not be specific to this product.</p> <p>Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.</p> <p>for copper and its compounds (typically copper chloride):</p> <p><b>Acute toxicity:</b> There are no reliable acute oral toxicity results available. In an acute dermal toxicity study (OECD TG 402), one group of 5 male rats and 5 groups of 5 female rats received doses of 1000, 1500 and 2000 mg/kg bw via dermal application for 24 hours. The LD50 values of copper monochloride were 2,000 mg/kg bw or greater for male (no deaths observed) and 1,224 mg/kg bw for female. Four females died at both 1500 and 2000 mg/kg bw, and one at 1,000 mg/kg bw. Symptom of the hardness of skin, an exudation of hardness site, the formation of scar and reddish changes were observed on application sites in all treated animals. Skin inflammation and injury were also noted. In addition, a reddish or black urine was observed in females at 2,000, 1,500 and 1,000 mg/kg bw. Female rats appeared to be more sensitive than male based on mortality and clinical signs.</p> <p>No reliable skin/eye irritation studies were available. The acute dermal study with copper monochloride suggests that it has a potential to cause skin irritation.</p> <p><b>Repeat dose toxicity:</b> In repeated dose toxicity study performed according to OECD TG 422, copper monochloride was given orally (gavage) to Sprague-Dawley rats for 30 days to males and for 39 - 51 days to females at concentrations of 0, 1.3, 5.0, 20, and 80 mg/kg bw/day. The NOAEL value was 5 and 1.3 mg/kg bw/day for male and female rats, respectively. No deaths were observed in male rats. One treatment-related death was observed in female rats in the high dose group. Erythropoietic toxicity (anaemia) was seen in both sexes at the 80 mg/kg bw/day. The frequency of squamous cell hyperplasia of the forestomach was increased in a dose-dependent manner in male and female rats at all treatment groups, and was statistically significant in males at doses of =20 mg/kg bw/day and in females at doses of =5 mg/kg bw/day doses. The observed effects are considered to be local, non-systemic effect on the forestomach which result from oral (gavage) administration of copper monochloride.</p> <p><b>Genotoxicity:</b> An in vitro genotoxicity study with copper monochloride showed negative results in a bacterial reverse mutation test with Salmonella typhimurium strains (TA 98, TA 100, TA 1535, and TA 1537) with and without S9 mix at concentrations of up to 1,000 ug/plate. An in vitro test for chromosome aberration in Chinese hamster lung (CHL) cells showed that copper monochloride induced structural and numerical aberrations at the concentration of 50, 70 and 100 ug/mL without S9 mix. In the presence of the metabolic activation system, significant increases of structural aberrations were observed at 50 and 70 ug/mL and significant increases of numerical aberrations were observed at 70 ug/mL. In an in vivo mammalian erythrocyte micronucleus assay, all animals dosed (15 - 60 mg/kg bw) with copper monochloride exhibited similar PCE/(PCE+NCE) ratios and MNPCE frequencies compared to those of the negative control animals. Therefore copper monochloride is not an in vivo mutagen.</p> <p><b>Carcinogenicity:</b> there was insufficient information to evaluate the carcinogenic activity of copper monochloride.</p> <p>Reproductive and developmental toxicity: In the combined repeated dose toxicity study with the reproduction/developmental toxicity screening test (OECD TG 422), copper monochloride was given orally (gavage) to Sprague-Dawley rats for 30 days to males and for 39-51 days to females at concentrations of 0, 1.3, 5.0, 20, and 80 mg/kg bw/day. The NOAEL of copper monochloride for fertility toxicity was 80 mg/kg bw/day for the parental animals. No treatment-related effects were observed on the reproductive organs and the fertility parameters assessed. For developmental toxicity the NOAEL was 20 mg/kg bw/day. Three of 120 pups appeared to have icterus at birth; 4 of 120 pups appeared runted at the highest dose tested (80 mg/kg bw/day).</p>
ethylene carbonate	<p>The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.</p> <p>For ethylene carbonate: Ethylene carbonate is rapidly converted to ethylene glycol, and both substances have similar toxicity in animals. In animals, chronic exposure has resulted in kidney damage. Testing has not shown ethylene carbonate to cause genetic toxicity. At sufficient doses, ethylene carbonate caused birth defects.</p> <p>For ethylene glycol:</p> <p>Ethylene glycol is quickly and extensively absorbed throughout the gastrointestinal tract. Limited information suggests that it is also absorbed through the airways; absorption through skin is apparently slow. Following absorption, it is distributed throughout the body. In humans, it is initially metabolized by alcohol dehydrogenase to form glycoaldehyde, which is rapidly converted to glycolic acid and glyoxal. These breakdown products are oxidized to glyoxylate, which may be further metabolized to formic acid, oxalic acid, and glycine. Breakdown of both glycine and formic acid can generate carbon dioxide, which is one of the major elimination products of ethylene glycol. In addition to exhaled carbon dioxide, ethylene glycol is eliminated in the urine as both the parent compound and glycolic acid. Elimination is rapid and occurs within a few hours.</p> <p>Respiratory effects: Respiratory system involvement occurs 12-24 hours after swallowing sufficient amounts of ethylene glycol. Symptoms include hyperventilation, shallow rapid breathing, and generalized swelling of the lungs with calcium oxalate deposits occasionally appearing in the lungs. Respiratory system involvement appears to be dose-dependent and occurs at the same time as cardiovascular changes. Later, there may be other changes compatible with adult respiratory distress syndrome (ARDS). Swelling of the lung can be a result of heart failure, ARDS, or aspiration of stomach contents. Symptoms related to acidosis such as fast or excessive breathing are frequently observed; however, major symptoms such as swelling of the lung and inflammation of the bronchi and lungs are relatively rare, and are usually seen only in extreme poisoning.</p> <p>Cardiovascular effects: Cardiovascular system involvement in humans occurs at the same time as respiratory system involvement, during the second phase of ethylene glycol poisoning by swallowing, which is 12-24 hours after acute exposure. The symptoms of poisoning involving the heart include increased heart rate, heart enlargement and ventricular gallop. There may also be high or low blood pressure, which may progress to cardiogenic shock. In lethal cases, inflammation of the heart muscle has been observed at autopsy. Cardiovascular involvement appears to be rare and usually seen after swallowing higher doses of ethylene glycol. In summary, acute exposure to high levels of ethylene glycol can cause serious cardiovascular effects in humans. The effects of a long-term, low-dose exposure are unknown.</p> <p>Gastrointestinal effects: Common early acute effects of swallowing ethylene glycol include nausea, vomiting with or without blood, heartburn and abdominal cramping and pain. One patient showed intermittent diarrhea and pain, and after surgery, deposition of oxalate crystals was shown to have occurred.</p> <p>Musculoskeletal effects: Reported musculoskeletal effects in cases of acute ethylene glycol poisoning include diffuse muscle tenderness and pain, associated with high levels of creatinine in the blood, and jerks and contractions associated with low calcium.</p> <p>Liver effects: Autopsies carried out on people who died following acute ethylene glycol poisoning showed deposition of calcium oxalate in the liver as well as hydropic and fatty degeneration and cell death (necrosis) of the liver.</p> <p>Kidney effects: Adverse kidney effects are seen during the third stage of ethylene glycol poisoning, 2-3 days after acute exposure. Calcium oxalate crystals are deposited in the tubules and are seen in the urine. There may also be degeneration and death of tubule cells, and inflammation of the tubule interstitium. If untreated, the degree of kidney damage progresses and leads to blood and protein in the urine, decreased kidney function, reduction in urine output and ultimately, kidney failure. With adequate supportive therapy, kidney function can return to normal or near normal.</p> <p>Metabolic effects: Metabolic changes can occur within 12 hours of exposure to ethylene glycol. There may be metabolic acidosis, caused by accumulation of glycolic acid in the blood and therefore a reduction in blood pH. The anion gap is increased, due to increased unmeasured anions (mainly glycolate).</p>

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	<p>Effects on the nervous system: Adverse reactions involving the nervous system are among the first symptoms to appear in humans after ethylene glycol is swallowed. These early effects are also the only symptoms caused by unmetabolised ethylene glycol. Together with metabolic effects (see above), they occur from 0.5-12 hours after exposure and are considered to be part of the first stage in ethylene glycol poisoning. Inco-ordination, slurred speech, confusion and sleepiness are common in the early stages, as are irritation, restlessness and disorientation. Later, there may be effects on cranial nerves (which may be reversible over many months). Swelling of the brain (cerebrum) and crystal deposits of calcium oxalate in the walls of the small blood vessels of the brain were found at autopsy in people who died after acute ethylene glycol poisoning.</p> <p>Reproductive effects: Animal testing showed that ethylene glycol may affect fertility, survival of fetuses and the male reproductive organs.</p> <p>Effects on development: Animal studies indicate that birth defects may occur after exposure in pregnancy; there may also be reduction in foetal weight.</p> <p>Cancer: No studies are known regarding cancer effects in humans or animal, after skin exposure to ethylene glycol.</p> <p>Genetic toxicity: No human studies available, but animal testing results are consistently negative.</p>
polyethylene	<p>polyethylene pyrolyzate</p> <p>Inclusion of polyethylene in the diet of rats at 8 g/kg/day did not result in treatment-related effects. Polyethylene implanted into rats and mice has reportedly caused local tumorigenic activity at doses of 33 to 2120 mg/kg, but the relevance to human exposure is not certain.</p>
sodium carboxymethylcellulose	<p>Neoplastic by RTECS criteria</p> <p>While thought to be uncommon, case reports of severe reactions to carboxymethylcellulose exist. In one such instance, a woman was known to experience anaphylaxis following exposure. Skin testing is believed to be a useful diagnostic tool for this purpose.</p> <p>Effects on inflammation, microbiota-related metabolic syndrome, and colitis are a subject of research Carboxymethyl cellulose has been found to cause inflammation of the gut, altering microbiota, and was found to be a triggering factor of inflammatory bowel diseases such as ulcerative colitis and Crohn's disease</p>
polypropylene & polyethylene	<p>For poly-alpha-olefins (PAOs):</p> <p>PAOs are highly branched, isoparaffinic chemicals produced by oligomerisation of 1-octene, 1-decene and/or 1-dodecene. The crude polyalphaolefin mixture is then distilled into appropriate product fractions to meet specific viscosity specifications and hydrogenated.</p> <p>In existing data, there appears to be no data to show that these structural analogs cause health effects. In addition, there is evidence in the literature that alkanes with 30 or more carbon atoms are unlikely to be absorbed when given by mouth. The physical and chemical properties make it unlikely that significant absorption into the body will occur. There are also no functional groups on PAO molecules that are biologically active. PAOs also have low volatility, so that exposure is unlikely to occur by inhalation. The high viscosity of these substances also makes it hard to generate a high concentration of breathable particles in air.</p> <p>Acute toxicity: Animal testing shows that PAOs have relatively low acute toxicity.</p> <p>Repeat dose toxicity: Animal testing shows that PAOs show low repeat dose toxicity – some increased scaling of the skin occurred, with skin inflammation, after exposure at high doses.</p> <p>Reproductive toxicity: Animal testing suggested that application of PAO to skin did not impair reproductive performance.</p> <p>Genetic toxicity: Testing has not shown any evidence that PAOs cause mutations or chromosomal aberrations.</p> <p>Cancer-causing potentials: Animal testing has not shown any propensity to cause tumours. While alpha-olefin polymers have similar properties to mineral oils, they do not contain polycyclic aromatic hydrocarbons, or other known cancer-causing materials.</p>
graphite & lithium fluorophosphate & ethylene carbonate	<p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.</p>
polypropylene & polyethylene & styrene/butadiene/ acrylonitrile copolymer	<p>The substance is classified by IARC as Group 3:</p> <p><b>NOT</b> classifiable as to its carcinogenicity to humans.</p> <p>Evidence of carcinogenicity may be inadequate or limited in animal testing.</p>
lithium iron phosphate & graphite & lithium fluorophosphate & aluminium & vinylidene fluoride homopolymer	<p>No significant acute toxicological data identified in literature search.</p>

Acute Toxicity	✓	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✓	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification  
 ✓ – Data available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

## Toxicity

12V 1400A PROFESSIONAL JUMP STARTER	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
lithium iron phosphate	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	72h	Algae or other aquatic plants	>24mg/l	2
	NOEC(ECx)	72h	Algae or other aquatic plants	>=24mg/l	2
	EC50	48h	Crustacea	>28mg/l	2
	LC50	96h	Fish	>28mg/l	2

Continued...

12V 1400A PROFESSIONAL JUMP STARTER

copper	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	72h	Algae or other aquatic plants	0.011-0.017mg/L	4
	EC50	96h	Algae or other aquatic plants	0.03-0.058mg/l	4
	NOEC(ECx)	48h	Fish	<0.001mg/L	4
	EC50	48h	Crustacea	<0.001mg/L	4
	LC50	96h	Fish	0.003mg/L	2
graphite	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	NOEC(ECx)	96h	Fish	>=100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
	LC50	96h	Fish	>100mg/l	2
lithium fluorophosphate	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	96h	Algae or other aquatic plants	43mg/l	2
	EC50	72h	Algae or other aquatic plants	62mg/l	2
	NOEC(ECx)	528h	Fish	0.2mg/l	2
	EC50	48h	Crustacea	98mg/l	2
	LC50	96h	Fish	42mg/l	2
ethylene carbonate	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	LC50	96h	Fish	>100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
	NOEC(ECx)	72h	Algae or other aquatic plants	100mg/l	2
dimethyl carbonate	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	96h	Algae or other aquatic plants	166.6-211mg/l	2
	EC50	72h	Algae or other aquatic plants	>57.29mg/l	2
	NOEC(ECx)	504h	Crustacea	25mg/l	2
	LC50	96h	Fish	>=100mg/l	2
	EC50	48h	Crustacea	>74.16mg/l	2
aluminium	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	EC50	72h	Algae or other aquatic plants	0.017mg/L	2
	EC50	96h	Algae or other aquatic plants	0.005mg/L	2
	NOEC(ECx)	72h	Algae or other aquatic plants	>100mg/l	1
	EC50	48h	Crustacea	0.736mg/L	2
	LC50	96h	Fish	0.078-0.108mg/l	2
polypropylene	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
polyethylene	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
vinylidene fluoride homopolymer	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
sodium carboxymethylcellulose	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96h	Fish	>20000mg/L	4
	EC50	48h	Crustacea	46.04-165.37mg/l	4
	EC50(ECx)	48h	Crustacea	46.04-165.37mg/l	4
styrene/ butadiene/ acrylonitrile copolymer	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
Legend:		Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data			



May cause long-term adverse effects in the aquatic environment.  
**DO NOT** discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
ethylene carbonate	HIGH	HIGH
dimethyl carbonate	HIGH	HIGH
polypropylene	LOW	LOW
polyethylene	LOW	LOW
vinylidene fluoride homopolymer	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
ethylene carbonate	LOW (LogKOW = -0.3388)
dimethyl carbonate	LOW (LogKOW = 0.2336)
aluminium	LOW (LogKOW = 0.33)
polypropylene	LOW (LogKOW = 17.21)
polyethylene	LOW (LogKOW = 17.04)
vinylidene fluoride homopolymer	LOW (LogKOW = 1.24)

Mobility in soil

Ingredient	Mobility
ethylene carbonate	LOW (KOC = 9.168)
dimethyl carbonate	LOW (KOC = 8.254)
polypropylene	LOW (KOC = 23.74)
polyethylene	LOW (KOC = 14.3)
vinylidene fluoride homopolymer	LOW (KOC = 35.04)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"><li>Recycle wherever possible or consult manufacturer for recycling options.</li><li>Consult State Land Waste Management Authority for disposal.</li><li><b>DO NOT</b> allow wash water from cleaning or process equipment to enter drains.</li><li>It may be necessary to collect all wash water for treatment before disposal.</li><li>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li><li>Where in doubt contact the responsible authority.</li><li>Recycle wherever possible or consult manufacturer for recycling options.</li><li>Consult State Land Waste Authority for disposal.</li><li>Bury or incinerate residue at an approved site.</li><li>Recycle containers if possible, or dispose of in an authorised landfill.</li></ul>
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Ensure that the hazardous substance is disposed in accordance with the Hazardous Substances (Disposal) Notice 2017

Disposal Requirements

Packages that have been in direct contact with the hazardous substance must be only disposed if the hazardous substance was appropriately removed and cleaned out from the package. The package must be disposed according to the manufacturer's directions taking into account the material it is made of. Packages which hazardous content have been appropriately treated and removed may be recycled.  
The hazardous substance must only be disposed if it has been treated by a method that changed the characteristics or composition of the substance and it is no longer hazardous.  
Only dispose to the environment if a tolerable exposure limit has been set for the substance.  
Only deposit the hazardous substance into or onto a landfill or sewage facility or incinerator, where the hazardous substance can be handled and treated appropriately.

SECTION 14 TRANSPORT INFORMATION

Labels Required

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Marine Pollutant	NO
HAZCHEM	2Y

Land transport (UN)

14.1. UN number or ID number	3480				
14.2. UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries) (contains lithium fluorophosphate)				
14.3. Transport hazard class(es)	<table><tr><td>Class</td><td>9</td></tr><tr><td>Subsidiary Hazard</td><td>Not Applicable</td></tr></table>	Class	9	Subsidiary Hazard	Not Applicable
Class	9				
Subsidiary Hazard	Not Applicable				
14.4. Packing group	Not Applicable				
14.5. Environmental hazard	Not Applicable				
14.6. Special precautions for user	<table><tr><td>Special provisions</td><td>188; 230; 310; 348; 376; 377; 384; 387</td></tr><tr><td>Limited quantity</td><td>0</td></tr></table>	Special provisions	188; 230; 310; 348; 376; 377; 384; 387	Limited quantity	0
Special provisions	188; 230; 310; 348; 376; 377; 384; 387				
Limited quantity	0				

Air transport (ICAO-IATA / DGR)

14.1. UN number	3480														
14.2. UN proper shipping name	Lithium ion batteries (including lithium ion polymer batteries) (contains lithium fluorophosphate)														
14.3. Transport hazard class(es)	<table><tr><td>ICAO/IATA Class</td><td>9</td></tr><tr><td>ICAO / IATA Subsidiary Hazard</td><td>Not Applicable</td></tr><tr><td>ERG Code</td><td>12FZ</td></tr></table>	ICAO/IATA Class	9	ICAO / IATA Subsidiary Hazard	Not Applicable	ERG Code	12FZ								
ICAO/IATA Class	9														
ICAO / IATA Subsidiary Hazard	Not Applicable														
ERG Code	12FZ														
14.4. Packing group	Not Applicable														
14.5. Environmental hazard	Not Applicable														
14.6. Special precautions for user	<table><tr><td>Special provisions</td><td>A88 A99 A154 A164 A183 A201 A213 A331 A334 A802</td></tr><tr><td>Cargo Only Packing Instructions</td><td>See 965</td></tr><tr><td>Cargo Only Maximum Qty / Pack</td><td>See 965</td></tr><tr><td>Passenger and Cargo Packing Instructions</td><td>Forbidden</td></tr><tr><td>Passenger and Cargo Maximum Qty / Pack</td><td>Forbidden</td></tr><tr><td>Passenger and Cargo Limited Quantity Packing Instructions</td><td>Forbidden</td></tr><tr><td>Passenger and Cargo Limited Maximum Qty / Pack</td><td>Forbidden</td></tr></table>	Special provisions	A88 A99 A154 A164 A183 A201 A213 A331 A334 A802	Cargo Only Packing Instructions	See 965	Cargo Only Maximum Qty / Pack	See 965	Passenger and Cargo Packing Instructions	Forbidden	Passenger and Cargo Maximum Qty / Pack	Forbidden	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden
Special provisions	A88 A99 A154 A164 A183 A201 A213 A331 A334 A802														
Cargo Only Packing Instructions	See 965														
Cargo Only Maximum Qty / Pack	See 965														
Passenger and Cargo Packing Instructions	Forbidden														
Passenger and Cargo Maximum Qty / Pack	Forbidden														
Passenger and Cargo Limited Quantity Packing Instructions	Forbidden														
Passenger and Cargo Limited Maximum Qty / Pack	Forbidden														

Sea transport (IMDG-Code / GGVSee)

14.1. UN number	3480						
14.2. UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries) (contains lithium fluorophosphate)						
14.3. Transport hazard class(es)	<table><tr><td>IMDG Class</td><td>9</td></tr><tr><td>IMDG Subsidiary Hazard</td><td>Not Applicable</td></tr></table>	IMDG Class	9	IMDG Subsidiary Hazard	Not Applicable		
IMDG Class	9						
IMDG Subsidiary Hazard	Not Applicable						
14.4. Packing group	Not Applicable						
14.5. Environmental hazard	Not Applicable						
14.6. Special precautions for user	<table><tr><td>EMS Number</td><td>F-A , S-I</td></tr><tr><td>Special provisions</td><td>188 230 310 348 376 377 384 387</td></tr><tr><td>Limited Quantities</td><td>0</td></tr></table>	EMS Number	F-A , S-I	Special provisions	188 230 310 348 376 377 384 387	Limited Quantities	0
EMS Number	F-A , S-I						
Special provisions	188 230 310 348 376 377 384 387						
Limited Quantities	0						

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
lithium iron phosphate	Not Available
copper	Not Available
graphite	Not Available
lithium fluorophosphate	Not Available
ethylene carbonate	Not Available
dimethyl carbonate	Not Available
aluminium	Not Available
polypropylene	Not Available
polyethylene	Not Available
vinylidene fluoride homopolymer	Not Available

Product name	Group
sodium carboxymethylcellulose	Not Available
styrene/ butadiene/ acrylonitrile copolymer	Not Available

14.7.3.

Product name	Ship Type
lithium iron phosphate	Not Available
copper	Not Available
graphite	Not Available
lithium fluorophosphate	Not Available
ethylene carbonate	Not Available
dimethyl carbonate	Not Available
aluminium	Not Available
polypropylene	Not Available
polyethylene	Not Available
vinylidene fluoride homopolymer	Not Available
sodium carboxymethylcellulose	Not Available
styrene/ butadiene/ acrylonitrile copolymer	Not Available

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

This substance is to be managed using the conditions specified in an applicable Group Standard

HSR Number	Group Standard
HSR002508	Additives Process Chemicals and Raw Materials Acutely Toxic Group Standard 2020
HSR002550	Corrosion Inhibitors Acutely Toxic Group Standard 2020
HSR002579	Food Additives and Fragrance Materials Acutely Toxic Group Standard 2020
HSR002593	Industrial and Institutional Cleaning Products Acutely Toxic Group Standard 2020
HSR002614	Metal Industry Products Acutely Toxic Group Standard 2020
HSR002645	Polymers Acutely Toxic Group Standard 2020
HSR002654	Solvents Acutely Toxic Group Standard 2020
HSR002675	Surface Coatings and Colourants Acutely Toxic Group Standard 2020
HSR002685	Water Treatment Chemicals Acutely Toxic Group Standard 2020
HSR100425	Pharmaceutical Active Ingredients Group Standard 2020
HSR100756	Active Ingredients for Use in the Manufacture of Agricultural Compounds Group Standard 2020
HSR100757	Veterinary Medicines Limited Pack Size Finished Dose Group Standard 2020
HSR100758	Veterinary Medicines Non dispersive Closed System Application Group Standard 2020

Please refer to Section 8 of the SDS for any applicable tolerable exposure limit or Section 12 for environmental exposure limit.

LITHIUM IRON PHOSPHATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

COPPER IS FOUND ON THE FOLLOWING REGULATORY LISTS

- New Zealand Workplace Exposure Standards (WES)
- New Zealand Land Transport Rule: Dangerous Goods 2005 - Schedule 1 Quantity limits for dangerous goods
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Approved Hazardous Substances with controls

GRAPHITE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)

LITHIUM FLUOROPHOSPHATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ETHYLENE CARBONATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- New Zealand Inventory of Chemicals (NZIoC)

**DIMETHYL CARBONATE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Approved Hazardous Substances with controls

**ALUMINIUM IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Workplace Exposure Standards (WES)
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Approved Hazardous Substances with controls

**POLYPROPYLENE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- Chemical Footprint Project - Chemicals of High Concern List
- New Zealand Inventory of Chemicals (NZIoC)
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

**POLYETHYLENE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

**VINYLDENE FLUORIDE HOMOPOLYMER IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)

**SODIUM CARBOXYMETHYLCELLULOSE IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data
- New Zealand Inventory of Chemicals (NZIoC)

**STYRENE/ BUTADIENE/ ACRYLONITRILE COPOLYMER IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- New Zealand Workplace Exposure Standards (WES)
- International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)
- New Zealand Inventory of Chemicals (NZIoC)
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

**Hazardous Substance Location**

Subject to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Hazard Class	Quantity (Compliance Certificate)	Quantity (Compliance Certificate - Farms >4 ha)
6.1B	250 kg or 250 L	500 kg or 500 L

**Certified Handler**

Subject to Part 4 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Class of substance	Quantities
6.1B	Any quantity

Refer Group Standards for further information

**Maximum quantities of certain hazardous substances permitted on passenger service vehicles**

Subject to Regulation 13.14 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Hazard Class	Gas (aggregate water capacity in mL)	Liquid (L)	Solid (kg)	Maximum quantity per package for each classification
6.1B	120	0,1	0,5	
6.5A or 6.5B	120	1	3	

**Tracking Requirements**

Subject to tracking according to the Health and Safety at Work (Hazardous Substances) Regulations 2017  
- Refer to the regulation for more information

**National Inventory Status**

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (lithium iron phosphate)
Canada - DSL	No (lithium fluorophosphate)
Canada - NDSL	No (lithium iron phosphate, copper, graphite, ethylene carbonate, dimethyl carbonate, aluminium, polypropylene, polyethylene, vinylidene fluoride homopolymer, sodium carboxymethylcellulose, styrene/ butadiene/ acrylonitrile copolymer)

China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (polypropylene, polyethylene, vinylidene fluoride homopolymer, sodium carboxymethylcellulose, styrene/ butadiene/ acrylonitrile copolymer)
Japan - ENCS	No (lithium iron phosphate, copper, graphite, lithium fluorophosphate, aluminium)
Korea - KECI	Yes
New Zealand - NZIoC	No (lithium iron phosphate, lithium fluorophosphate)
Philippines - PICCS	No (lithium iron phosphate)
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (lithium iron phosphate, lithium fluorophosphate, ethylene carbonate, vinylidene fluoride homopolymer)
Vietnam - NCI	Yes
Russia - FBEPH	No (lithium iron phosphate, lithium fluorophosphate)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 OTHER INFORMATION

Revision Date	05/02/2025
Initial Date	22/12/2020

SDS Version Summary

Version	Issue Date	Sections Updated
9.1	20/10/2023	Hazards identification - Classification
10.1	05/02/2025	Hazards identification - Classification, Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

Ingredients with multiple cas numbers

Name	CAS No
lithium iron phosphate	15365-14-7, 349632-76-4, 1199808-36-0, 1220982-34-2, 1268612-70-9, 1313430-35-1, 1369626-25-4, 1374831-14-7, 1444634-63-2, 1448147-16-7, 1449688-81-6, 1482516-10-8, 1632377-10-6, 1644383-03-8, 1802472-84-9, 1824717-95-4, 2083641-40-9, 388094-81-3, 441353-03-3, 855792-36-8, 916501-48-9, 939775-70-9, 950895-64-4
copper	7440-50-8, 133353-46-5, 133353-47-6, 195161-80-9, 65555-90-0, 72514-83-1, 1441640-38-5, 1993435-25-8, 2056901-56-3
graphite	7782-42-5, 115344-49-5, 1215114-94-5, 12424-49-6, 12751-41-6, 1397692-45-3, 1399-57-1, 155660-93-8, 156854-02-3, 159251-18-0, 164973-65-3, 1811526-35-8, 182761-22-4, 2093098-71-4, 2179292-22-7, 2183464-49-3, 37265-44-4, 37265-48-8, 50814-81-8, 72840-52-9, 82696-74-0, 82696-75-1, 82701-02-8, 82701-03-9, 82701-04-0, 82701-05-1, 82701-06-2, 82709-42-0, 83797-07-3, 84739-05-9, 857167-12-5, 87934-03-0
aluminium	7429-90-5, 91728-14-2
polypropylene	9003-07-0, 25085-53-4, 1007233-35-3, 104625-25-4, 1072914-17-0, 1084698-59-8, 112024-68-7, 112327-42-1, 112821-10-0, 1161009-62-6, 1170942-23-0, 1187015-71-9, 122933-37-3, 123243-04-9, 131801-18-8, 132823-57-5, 133757-66-1, 1365635-76-2, 1365657-50-6, 139465-75-1, 143710-36-5, 144855-91-4, 148464-77-1, 150261-04-4, 156680-70-5, 159074-97-2, 162731-35-3, 169741-70-2, 171903-39-2, 178535-67-6, 181232-12-2, 186777-48-0, 201873-76-9, 215369-91-8, 220286-70-4, 221350-75-0, 223461-98-1, 262610-59-3, 268745-65-9, 286465-97-2, 301161-99-9, 313378-44-8, 313471-92-0, 343259-03-0, 349655-63-6, 368887-79-0, 37329-03-6, 37370-57-3, 391599-57-8, 399509-34-3, 425369-26-2, 439608-93-2, 457057-49-7, 52440-18-3, 52622-64-7, 53664-32-7, 582300-70-7, 58318-95-9, 60440-68-8, 73989-50-1, 107001-49-0, 109281-32-5, 1292821-55-6, 1330065-51-4, 1369482-55-2, 1428902-81-1, 1429741-59-2, 1449076-61-2, 1596356-13-6, 1610944-39-2, 1646789-22-1, 170346-99-3, 1708965-95-0, 1808111-63-8, 1821166-88-4, 1821374-82-6, 182876-31-9, 1850381-83-7, 1855877-67-6, 1980812-29-0, 2002431-75-4, 2014375-57-4, 2089120-70-5, 2094994-09-7, 2133458-36-1, 2170444-76-3, 76560-78-6, 796853-32-2, 848784-13-4, 868670-76-2, 875121-17-8, 883306-97-6, 890309-25-8, 9044-59-1, 928298-83-3, 929710-90-7, 95751-29-4, 958447-30-8
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## 12V 1400A PROFESSIONAL JUMP STARTER

	162874-91-1, 1649951-85-8, 1677671-23-6, 1702269-80-4, 1702270-01-6, 1802543-41-4, 1824668-77-0, 187175-95-7, 1887056-94-1, 2057523-80-3, 2089282-60-8, 2104653-94-1, 211866-91-0, 211866-97-6, 212134-14-0, 213018-57-6, 2133458-27-0, 214692-40-7, 2169741-87-9
sodium carboxymethylcellulose	9004-32-4, 9085-26-1, 1012064-31-1, 117385-93-0, 1262215-38-2, 12624-09-8, 1296213-64-3, 1422717-46-1, 1428980-42-0, 147881-80-9, 1610028-94-8, 1610029-04-3, 198084-97-8, 2014388-59-9, 2072854-79-4, 2131127-75-6, 2228913-23-1, 2229957-39-3, 247080-55-3, 37231-14-4, 37231-15-5, 404943-62-0, 454679-81-3, 50642-44-9, 54018-17-6, 55607-96-0, 64103-90-8, 654655-39-7, 73699-63-5, 80296-93-1, 81209-86-1, 82197-79-3, 854036-84-3, 9045-95-8
styrene/ butadiene/ acrylonitrile copolymer	9003-56-9, 101484-40-6, 1186292-82-9, 1430815-64-7, 1468403-04-4, 166091-25-4, 179865-29-3, 179865-39-5, 2099119-81-8, 288860-11-7, 37229-19-9, 37331-48-9, 39291-19-5, 39306-83-7, 52433-83-7, 52434-26-1, 52434-32-9, 52682-91-4, 52907-26-3, 53637-30-2, 73990-12-2, 74238-96-3, 74238-98-5, 82346-94-9, 874948-21-7, 884843-12-3, 884905-25-3, 96827-60-0, 97048-04-9

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

### Definitions and abbreviations

- PC - TWA: Permissible Concentration-Time Weighted Average
- PC - STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit,
- IDLH: Immediately Dangerous to Life or Health Concentrations
- ES: Exposure Standard
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index
- DNEL: Derived No-Effect Level
- PNEC: Predicted no-effect concentration
- MARPOL: International Convention for the Prevention of Pollution from Ships
- IMSBC: International Maritime Solid Bulk Cargoes Code
- IGC: International Gas Carrier Code
- IBC: International Bulk Chemical Code
- AIIC: Australian Inventory of Industrial Chemicals
- DSL: Domestic Substances List
- NDSL: Non-Domestic Substances List
- IECSC: Inventory of Existing Chemical Substance in China
- EINECS: European INventory of Existing Commercial chemical Substances
- ELINCS: European List of Notified Chemical Substances
- NLP: No-Longer Polymers
- ENCS: Existing and New Chemical Substances Inventory
- KECI: Korea Existing Chemicals Inventory
- NZIoC: New Zealand Inventory of Chemicals
- PICCS: Philippine Inventory of Chemicals and Chemical Substances
- TSCA: Toxic Substances Control Act
- TCSI: Taiwan Chemical Substance Inventory
- INSQ: Inventario Nacional de Sustancias Químicas
- NCI: National Chemical Inventory
- FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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