Lithium-ion Battery - Rechargeable (Brand Ryobi)

Techtronic Industries Australia Pty Ltd

Chemwatch Hazard Alert Code: **0**

Chemwatch: **5514-15**
Version No: **5.1**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **09/03/2023**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Lithium-ion Battery - Rechargeable (Brand Ryobi)
Chemical Name	Not Applicable
Synonyms	AP4001 4V 1.3Ah 5Wh, CB121L 12V 1.3Ah 14Wh, P102 18V 1.3Ah 24Wh, P105 18V 2.6Ah 48Wh, P107 18V 1.5Ah 27Wh, P108 18V 4Ah 72Wh, HP108L 8V 1.3Ah 9.5Wh, HP44L 4V 1.3Ah 5Wh, OP242 24V 2.6Ah 56Wh, OP243 24V 1.5Ah 33Wh, OP4015 40V 1.5Ah 54Wh, OP4026 40V 2.6Ah 95Wh, OP4040 40V 4Ah 144Wh, BSPL1213 12V 1.3Ah 15Wh, RB12L13 12V 1.3Ah 14Wh, BPL1414 14.4V 1.4Ah 19Wh, RB14L15 14.4V 1.5Ah 21.9Wh, RB14L25 14.4V 2.5Ah 36Wh, RB18L13 18V 1.3Ah 24Wh, RB18L26 18V 2.6Ah 48Wh, RB18L15 18V 1.5Ah 27Wh, RB18L40 18V 4Ah 72Wh, RB18L25 18V 2.5Ah 45Wh, RB18L50 18V 5Ah 90Wh, R8DD-L13 8V 1.3Ah 9.5Wh, BPL3615 36V 1.5Ah 54Wh, BPL3626 36V 2.6Ah 93.6Wh, BPL3640 36V 4Ah 144Wh, BPL3640D 36V 4Ah 144Wh, BPL3650D 36V 5Ah 180Wh, BPL3626D 36V 2.6Ah 95Wh, BPL3625D 36V 2.5Ah 90Wh, ES9200 5V 0.4Ah 2Wh, OP4050 40V 5Ah 180Wh, BPL3650 36V 5Ah 180Wh, RPS1215 12V 1.3Ah 14Wh, R7SD 7.2V 1.3Ah 9.5Wh, R4SDP 4V 1.3Ah 5Wh, P190 18V 2Ah 36Wh, RB18L20 18V 2Ah 36Wh, OP40261 40V 2.6Ah 95Wh, P194 18V 9Ah 162Wh, P189 18V 1.5Ah 27Wh, OP4030 40V 3Ah 108Wh, RB18L90 18V 9Ah 162Wh, BPL3626D2 36V 2.6Ah 95Wh, BPL3630D 36V 3Ah 108Wh, RB18L15B 18V 1.5Ah 27Wh, P192 18V 4Ah 72Wh, RB18L40B 18V 4Ah 72Wh, OP40301 40V 3Ah 108Wh, OP40501 40V 5Ah 180Wh, BPL3650D2 36V 5Ah 180Wh, P191 18V 3Ah 54Wh, RB18L30 18V 3Ah 54Wh, RB18L30A 18V 3Ah 54Wh, RB18L20A 18V 2Ah 36Wh, P192 18V 4Ah 72Wh, RB18L40B 18V 4Ah 72Wh, RB18L40A 18V 4Ah 72Wh, RB18L90A 18V 9Ah 162Wh, ERGO 4V 1.5Ah 5Wh, ERGO 4V 1.3Ah 5Wh, P193 18V 6Ah 108Wh, RB18L60 18V 6Ah 108Wh, RB18L60A 18V 6Ah 108Wh, RB18L15A 18V 1.5Ah 27Wh, P102 18V 1.5Ah 27Wh, P197 18V 4Ah 72Wh, HP34L 4V 1.5Ah 5Wh, RB18L25A 18V 2.5Ah 45Wh, RB18L40A 18V 4Ah 72Wh, OP40601 40V 6Ah 216Wh, OP40501 40V 5Ah 180Wh, OP40201 40V 2Ah 72Wh, OP40401 40V 4Ah 144Wh, OP40301 40V 3Ah 144Wh, HP108L, R8DD, R7SD 8V 1.3Ah 9.5Wh, RB18L50, P177 18V 5Ah 90Wh, HP44L, R4DSP 4V 1.3Ah 5Wh, HP43L, R4SD 4V 1.3Ah 5Wh, P191 18V 3Ah 54Wh, ERGO, R4SDC 4V 1.5Ah 5Wh, ERGO, R4SDC 4V 1.3Ah 5Wh, P195, RB18L30, RB18L30A 18V 3Ah 54Wh, RB18L25B 18V 2.5Ah 45Wh, RB18L50A 18V 5Ah 90Wh, BPL3640D2 36V 4Ah 144Wh, BPL3660D 36V 6Ah 216Wh, BPL3620D 36V 2Ah 72Wh, R4SD 4V 1.5Ah 6Wh, R4SDP 4V 1.5Ah 6Wh, R7SD 7.2V 1.5Ah 10.8Wh, R8DD 8V 1.5Ah 12Wh, P108, P197, RB18L40, RB18L40A 18V 4Ah 73Wh, P108, P197, RB18L40, RB18L40A 18V 4Ah 72Wh, OP40602 40V 6Ah 216Wh, RY36B60A, BPL3660D 36V 6Ah 216Wh, HP34L 4V 1.3Ah 5Wh, OP40752 40V 7.5Ah 270Wh, OP40902 40V 9Ah 324Wh, OP40122 40V 12Ah 432Wh, RY36B90A, BPL3690D 36V 9Ah 324Wh, RY36B12A, BPL3612D 36V 12Ah 432Wh, PBP001 18V 1.3Ah 24Wh, RB18L13, RB18L13Z 18V 1.3Ah 24Wh, P4400 4V 2Ah 7Wh, PBP002 18V 1.5Ah 27Wh, RB1815C 18V 1.5Ah 27Wh, PBP003 18V 2Ah 36Wh, PBP003 18V 2Ah 37Wh, PBP004 18V 4Ah 72Wh, PBP004 18V 4Ah 74Wh, PBP005 18V 4Ah 72Wh, PBP005 18V 4Ah 74Wh, PBP006 18V 2Ah 36Wh, PBP006 18V 2Ah 37Wh, RB1820C 18V 2Ah 36Wh, RB1820C 18V 2Ah 37Wh, RB1840C 18V 4Ah 72Wh, RB1840C 18V 4Ah 74Wh, RB1840X 18V 4Ah 72Wh, RB1840X 18V 4Ah 74Wh, OP40404 40V 4Ah 144Wh, OP40204 40V 2Ah 72Wh, OP40504 40V 5Ah 180Wh, OP40604 40V 6Ah 216Wh, OP40602VNM 40V 6Ah 216Wh, RB12L20 12V 2Ah 22Wh, BSPL1220 12V 2Ah 22Wh, R36BTY2, RY36B20B 36V 2Ah 72Wh, R36BTY4, RY36B40B 36V 4Ah 144Wh, R36BTY5, RY36B50B 36V 5Ah 180Wh, RB1850C 18V 5Ah 90Wh, RB1850X 18V 5Ah 90Wh, OP40753 40V 7.5Ah 270Wh, OP40404VNM 40V 4Ah 144Wh, PBP002 18V 1.5Ah 28Wh, RB1815C 18V 1.5Ah 28Wh, PBP007 18V 6Ah 108Wh, RB1860X 18V 6Ah 108Wh, RB1825C 18V 2.5Ah 45Wh, OP40603VNM 40V 6Ah 216Wh, OP40753VNM 40V 7.5Ah 270Wh, OP40125 40V 12Ah 432Wh, OP40125VNM 40V 12Ah 432Wh, OP40605 40V 6Ah 216Wh, OP40605VNM 40V 6Ah 216Wh, OP40504VNM 40V 5Ah 180Wh,; OP40804 40V 8Ah 304Wh, OP40603 40V 6Ah 216Wh, RB18L20 18V 2Ah 37Wh, AP4001 4V 1.5Ah 6Wh, HP108L 8V 1.5Ah 11Wh, HP34LVN 4V 1.5Ah 5Wh, HP44LVN 4V 1.5Ah 5Wh, RB1840HE 18V 4Ah 72Wh, OP40204VNM 40V 2Ah 72Wh, FVB01, RB420 4V 2Ah 7.4Wh, PBP017 18V 6Ah 108Wh,; BPL3650D2 36V 5Ah 180Wh, RB18L30 18V 3Ah 54Wh, RB18L30A 18V 3Ah 54Wh, RB18L20A 18V 2Ah 36Wh, RB18L40B 18V 4Ah 72Wh, RB18L40A 18V 4Ah 72Wh, RB18L90A 18V 9Ah 162Wh, RB18L60 18V 6Ah 108Wh, RB18L60A 18V 6Ah 108Wh, RB18L15A 18V 1.5Ah 27Wh, RB18L25A 18V 2.5Ah 45Wh, RB18L40A 18V 4Ah 72Wh, RB18L50 18V 5Ah 90Wh, R4DSP 4V 1.3Ah 5Wh, R4SD 4V 1.3Ah 5Wh, RB18L30/A 18V 3Ah 54Wh, RB18L25B 18V 2.5Ah 45Wh, RB18L50A 18V 5Ah 90Wh, BPL3640D2 36V 4Ah 144Wh, BPL3660D 36V 6Ah 216Wh, BPL3620D 36V 2Ah 72Wh, R4SD 4V 1.5Ah 6Wh, R4SDP 4V 1.5Ah 6Wh, R7SD 7.2V 1.5Ah 10.8Wh, R8DD 8V 1.5Ah 12Wh, RB18L40/A 18V 4Ah 73Wh, RB18L40/A 18V 4Ah 72Wh, BPL3660D 36V 6Ah 216Wh, BPL3690D 36V 9Ah 324Wh, BPL3612D 36V 12Ah 432Wh, RB18L13/Z 18V 1.3Ah 24Wh, RB1815C 18V 1.5Ah 27Wh, RB1820C 18V 2Ah 36Wh, RB1820C 18V 2Ah 37Wh, RB1840C 18V 4Ah 74Wh, RB1840X 18V 4Ah 72Wh, RB1840X 18V 4Ah 74Wh, RY36B20B 36V 2Ah 72Wh, R36BTY4 36V 4Ah 144Wh, R36BTY5 36V 5Ah 180Wh, RB1850C 18V 5Ah 90Wh, RB1850X 18V 5Ah 90Wh, RB1815C 18V 1.5Ah 28Wh, RB1860X 18V 6Ah 108Wh, RB1825C 18V 2.5Ah 45Wh, RB18L20 18V 2Ah 37Wh, RB1840HE 18V 4Ah 72Wh, RRT12 12V 2Ah 22Wh, RB1840T 18V 4.0Ah 72Wh; OP801720, R80BAT10 80V 10Ah 720Wh, R36BAT42 36V 4Ah 144Wh, R36BTY6 36V 6Ah 216Wh, R36BTY8 36V 8Ah 288Wh, R36BTY12 36V 12Ah 432Wh, RB4L30 4V 3Ah 10.8Wh, RB4L20 4V 2Ah 7.4Wh
Proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
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	NOTE: Hazard statement relates to battery contents. Potential for exposure should not exist unless the battery leaks, is exposed to high temperatures or is mechanically, physically or electrically abused. Use involves discharge then regenerative charging cycle from external DC power source. CHARGING HAZARD. Completion of charging process includes evolution of highly flammable and explosive hydrogen gas which is readily detonated by electric spark. No smoking or naked lights. Use according to manufacturer's directions.

Details of the manufacturer or supplier of the safety data sheet

Registered company name	**Techtronic Industries Australia Pty Ltd**	**Techtronic Industries N.Z. Limited**
Address	31 Gilby Road, Mount Waverley Melbourne, VIC 3149 Australia	Unit C 70 Business Parade South Highbrook, Auckland 2013 New Zealand
Telephone	1300 697 9624	0508 697 9624
Fax	Not Available	0800 479 624

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Website	http://www.hoover.com.au/	http://www.ryobi.co.nz/
Email	sales@hoover.com.au	customerservice@tti.co.nz

Emergency telephone number

Association / Organisation	Poison Information Centre	Poison Information Centre (New Zealand)	CHEMWATCH EMERGENCY RESPONSE (24/7)
Emergency telephone numbers	13 11 26 (24 hours a day, seven days a week, Australia)	0800 764 766 (New Zealand)	+61 1800 951 288
Other emergency telephone numbers	Not Available	Not Available	+61 3 9573 3188

Once connected and if the message is not in your preferred language then please dial 01

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Not Applicable

Label elements

Hazard pictogram(s)	Not Applicable
Signal word	**Not Applicable**

Hazard statement(s)

Not Applicable

Precautionary statement(s) General

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read carefully and follow all instructions.

Precautionary statement(s) Prevention

Not Applicable

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

Not Applicable

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
Not Available		hermetically sealed metal containers with electrochemical contents, typically
12031-65-1	0-35	lithium nickel oxide
7440-44-0	0-30	carbon, activated
7439-89-6	0-25	iron
7440-50-8	0-30	copper
7429-90-5	0-15	aluminium
12190-79-3	0-50	lithium cobaltate
616-38-6	0-10	dimethyl carbonate
12057-17-9	0-15	lithium manganate
9002-88-4	0-10	polyethylene
96-49-1	0-5	ethylene carbonate
21324-40-3	0-10	lithium fluorophosphate
7782-42-5	0-30	graphite
623-53-0	0-5	ethyl methyl carbonate
7440-02-0	0-5	nickel
25640-14-6	0-1	dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol

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CAS No	%[weight]	Name
9003-07-0	0-1	polypropylene
16812-54-7	0-1	nickel(II) sulfide
26023-21-2	0-1	imide resin
7440-21-3	0-1	silicon
554-13-2	0-1	lithium carbonate
1333-86-4	0-1	carbon black
9003-55-8	0-1	styrene/ butadiene copolymer
26337-35-9	0-1	poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density
9004-32-4	0-1	sodium carboxymethylcellulose
110-61-2	0-1	succinonitrile
11089-89-7	0-1	lithium aluminate
346417-97-8	0-35	lithium nickel manganese cobalt oxide
113066-89-0	0-40	lithium nickel cobalt oxide
24937-79-9	0-10	vinylidene fluoride homopolymer
10097-28-6	0-5	silicon monoxide
554-12-1	0-5	methyl propionate
114435-02-8	0-5	fluoroethylene carbonate
1318-23-6	0-1	boehmite
872-50-4	0-1	N-methyl-2-pyrrolidone
7440-47-3	0-1	chromium
100-41-4	0-1	ethylbenzene
182442-95-1	0-50	cobalt lithium manganese nickelate
1309-37-1	0-1	ferric oxide
141-78-6	0-10	ethyl acetate
1307-96-6	0-30	cobalt (II) oxide
1313-13-9	0-30	manganese dioxide
1313-99-1	0-30	nickel oxide
92-52-4	0-0.3	biphenyl
13463-67-7	0-10	titanium dioxide
12016-80-7	0-10	cobalt(III) oxide monohydrate
1308-06-1	0-10	cobalt oxide (tetroxide)
546-93-0	0-10	magnesite
90076-65-6	0-1	N-lithiotrifluoromethanesulfonimide
30174-67-5	0-1	itaconic acid/ 1,3-butadiene/ styrene copolymer
111-69-3	0-1	adiponitrile
15365-14-7	0-30	lithium iron phosphate
Not Available	balance	Aluminum, Steel, Nickel and other inert materials

Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 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

Description of first aid measures

Eye Contact	▸ Generally not applicable. If this product comes in contact with eyes: ▸ Wash out immediately with water. ▸ If irritation continues, seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	▸ Generally not applicable. If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ Generally not applicable. ▸ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▸ Other measures are usually unnecessary.
Ingestion	▸ Generally not applicable. ▸ Not considered a normal route of entry. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

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Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

Extinguishing media

- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known. ▸ Keep dry ▸ **NOTE:** May develop pressure in containers; open carefully. Vent periodically.

Advice for firefighters

Fire Fighting	Slight hazard when exposed to heat, flame and oxidisers.
Fire/Explosion Hazard	▸ Non combustible. ▸ Not considered to be a significant fire risk. ▸ Heating may cause expansion or decomposition leading to violent rupture of containers. Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place. Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard.
HAZCHEM	2Y

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

Minor Spills	Clean up all spills immediately. Avoid contact with skin and eyes. Place in suitable containers for disposal.
Major Spills	▸ Clean up all spills immediately. ▸ Wear protective clothing, safety glasses, dust mask, gloves. ▸ Secure load if safe to do so.

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

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	Do not connect the positive terminal to the negative terminal with electrical wire or chain. Avoid polarity reverse connection when installing the battery to an instrument. Do not wet the battery with water, seawater or acid; or expose to strong oxidizer. Do not damage or remove the external tube. Keep the battery away from heat and fire. Do not disassemble or reconstruct the battery; or solder the battery directly. Do not give a mechanical shock or deform. Do not use unauthorized charger or other charging method. This battery is manufactured in a charged state. It is NOT designed for recharging. Inadvertent charging can occur if a battery is installed backwards. Use good occupational work practice. Observe manufacturer's storage and handling recommendations contained within this SDS. Avoid physical damage to containers.
Other information	▸ Keep dry. ▸ Store under cover. ▸ Protect containers against physical damage. Keep out of reach of children. Store out of direct sunlight ▸ Store away from incompatible materials.

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	Avoid contamination of water, foodstuffs, feed or seed. ▸ Keep dry ▸ **NOTE:** May develop pressure in containers; open carefully. Vent periodically.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

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INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	copper	Copper (fume)	0.2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	copper	Copper, dusts & mists (as Cu)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium	Aluminium (metal dust)	10 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium	Aluminium (welding fumes) (as Al)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	aluminium	Aluminium, pyro powders (as Al)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	lithium manganate	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	graphite	Graphite (all forms except fibres) (respirable dust) (natural & synthetic)	3 mg/m3	Not Available	Not Available	(e) Containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	nickel	Nickel, metal	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel	Nickel, powder	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel(II) sulfide	Nickel sulphide roasting (fume & dust) (as Ni)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	silicon	Silicon	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	carbon black	Carbon black	3 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	lithium nickel manganese cobalt oxide	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	boehmite	Aluminium oxide	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	N-methyl-2-pyrrolidone	1-Methyl-2-pyrrolidone	25 ppm / 103 mg/m3	309 mg/m3 / 75 ppm	Not Available	Not Available
Australia Exposure Standards	chromium	Chromium (metal)	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ethylbenzene	Ethyl benzene	100 ppm / 434 mg/m3	543 mg/m3 / 125 ppm	Not Available	Not Available
Australia Exposure Standards	cobalt lithium manganese nickelate	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ferric oxide	Iron oxide fume (Fe2O3) (as Fe)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ferric oxide	Rouge dust	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	ethyl acetate	Ethyl acetate	200 ppm / 720 mg/m3	1440 mg/m3 / 400 ppm	Not Available	Not Available
Australia Exposure Standards	manganese dioxide	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	biphenyl	Biphenyl	0.2 ppm / 1.3 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	titanium dioxide	Titanium dioxide	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	magnesite	Magnesite	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
carbon, activated	6 mg/m3	330 mg/m3	2,000 mg/m3
iron	3.2 mg/m3	35 mg/m3	150 mg/m3
copper	3 mg/m3	33 mg/m3	200 mg/m3
dimethyl carbonate	11 ppm	120 ppm	700 ppm
polyethylene	16 mg/m3	170 mg/m3	1,000 mg/m3
ethylene carbonate	30 mg/m3	330 mg/m3	2,000 mg/m3
lithium fluorophosphate	7.5 mg/m3	83 mg/m3	500 mg/m3
graphite	6 mg/m3	330 mg/m3	2,000 mg/m3

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Ingredient	TEEL-1	TEEL-2	TEEL-3
nickel	4.5 mg/m3	50 mg/m3	99 mg/m3
polypropylene	5.2 mg/m3	58 mg/m3	350 mg/m3
silicon	45 mg/m3	100 mg/m3	630 mg/m3
lithium carbonate	3.1 mg/m3	34 mg/m3	210 mg/m3
carbon black	9 mg/m3	99 mg/m3	590 mg/m3
lithium aluminate	28 mg/m3	310 mg/m3	1,800 mg/m3
lithium aluminate	37 mg/m3	400 mg/m3	2,400 mg/m3
silicon monoxide	30 mg/m3	330 mg/m3	2,000 mg/m3
boehmite	15 mg/m3	170 mg/m3	990 mg/m3
N-methyl-2-pyrrolidone	30 ppm	32 ppm	190 ppm
chromium	1.5 mg/m3	17 mg/m3	99 mg/m3
ethylbenzene	Not Available	Not Available	Not Available
ferric oxide	15 mg/m3	360 mg/m3	2,200 mg/m3
ethyl acetate	1,200 ppm	1,700 ppm	10000** ppm
cobalt (II) oxide	0.076 mg/m3	4.2 mg/m3	25 mg/m3
manganese dioxide	4.7 mg/m3	7.9 mg/m3	690 mg/m3
manganese dioxide	4.2 mg/m3	6.9 mg/m3	41 mg/m3
nickel oxide	0.76 mg/m3	220 mg/m3	1,300 mg/m3
biphenyl	0.87 ppm	Not Available	300 ppm
titanium dioxide	30 mg/m3	330 mg/m3	2,000 mg/m3
cobalt oxide (tetroxide)	0.082 mg/m3	4.5 mg/m3	27 mg/m3
magnesite	45 mg/m3	260 mg/m3	1,600 mg/m3
adiponitrile	0.35 ppm	3.8 ppm	8.1 ppm

Ingredient	Original IDLH	Revised IDLH
lithium nickel oxide	10 mg/m3	Not Available
carbon, activated	Not Available	Not Available
iron	Not Available	Not Available
copper	100 mg/m3	Not Available
aluminium	Not Available	Not Available
lithium cobaltate	Not Available	Not Available
dimethyl carbonate	Not Available	Not Available
lithium manganate	500 mg/m3	Not Available
polyethylene	Not Available	Not Available
ethylene carbonate	Not Available	Not Available
lithium fluorophosphate	Not Available	Not Available
graphite	1,250 mg/m3	Not Available
ethyl methyl carbonate	Not Available	Not Available
nickel	10 mg/m3	Not Available
dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol	Not Available	Not Available
polypropylene	Not Available	Not Available
nickel(II) sulfide	10 mg/m3	Not Available
imide resin	Not Available	Not Available
silicon	Not Available	Not Available
lithium carbonate	Not Available	Not Available
carbon black	1,750 mg/m3	Not Available
styrene/ butadiene copolymer	Not Available	Not Available
poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density	Not Available	Not Available
sodium carboxymethylcellulose	Not Available	Not Available
succinonitrile	25 mg/m3	Not Available
lithium aluminate	Not Available	Not Available
lithium nickel manganese cobalt oxide	500 mg/m3 / 10 mg/m3	Not Available
lithium nickel cobalt oxide	10 mg/m3	Not Available
vinylidene fluoride homopolymer	Not Available	Not Available
silicon monoxide	Not Available	Not Available
methyl propionate	Not Available	Not Available

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Ingredient	Original IDLH	Revised IDLH
fluoroethylene carbonate	Not Available	Not Available
boehmite	Not Available	Not Available
N-methyl-2-pyrrolidone	Not Available	Not Available
chromium	250 mg/m3	Not Available
ethylbenzene	800 ppm	Not Available
cobalt lithium manganese nickelate	500 mg/m3 / 10 mg/m3	Not Available
ferric oxide	2,500 mg/m3	Not Available
ethyl acetate	2,000 ppm	Not Available
cobalt (II) oxide	Not Available	Not Available
manganese dioxide	500 mg/m3	Not Available
nickel oxide	10 mg/m3	Not Available
biphenyl	100 mg/m3	Not Available
titanium dioxide	5,000 mg/m3	Not Available
cobalt(III) oxide monohydrate	Not Available	Not Available
cobalt oxide (tetroxide)	Not Available	Not Available
magnesite	Not Available	Not Available
N-lithiotrifluoromethanesulfonimide	Not Available	Not Available
itaconic acid/ 1,3-butadiene/ styrene copolymer	Not Available	Not Available
adiponitrile	25 mg/m3	Not Available
lithium iron phosphate	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
lithium nickel oxide	E	≤ 0.01 mg/m³
lithium cobaltate	E	≤ 0.01 mg/m³
ethylene carbonate	E	≤ 0.01 mg/m³
lithium fluorophosphate	E	≤ 0.01 mg/m³
imide resin	E	≤ 0.01 mg/m³
lithium carbonate	E	≤ 0.01 mg/m³
succinonitrile	E	≤ 0.01 mg/m³
lithium nickel cobalt oxide	D	> 0.01 to ≤ 0.1 mg/m³
silicon monoxide	E	≤ 0.01 mg/m³
methyl propionate	E	≤ 0.1 ppm
fluoroethylene carbonate	E	≤ 0.1 ppm
cobalt (II) oxide	E	≤ 0.01 mg/m³
nickel oxide	D	> 0.01 to ≤ 0.1 mg/m³
cobalt oxide (tetroxide)	E	≤ 0.01 mg/m³
N-lithiotrifluoromethanesulfonimide	E	≤ 0.01 mg/m³
adiponitrile	E	≤ 0.1 ppm
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.*	

MATERIAL DATA

Exposure controls

Appropriate engineering controls	General exhaust is adequate under normal operating conditions. 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.
Individual protection measures, such as personal protective equipment	
Eye and face protection	None under normal operating conditions. **OTHERWISE:** ▸ Safety glasses.
Skin protection	See Hand protection below
Hands/feet protection	None under normal operating conditions. **OTHERWISE:** ▸ Rubber Gloves
Body protection	See Other protection below

Continued...

Other protection	No special equipment needed when handling small quantities

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
Lithium-ion Battery - Rechargeable (Brand Ryobi)

Material	CPI
BUTYL	C
BUTYL/NEOPRENE	C
CPE	C
HYPALON	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
NITRILE+PVC	C
PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23 2-PLY	C
SARANEX-23	C
TEFLON	C
VITON	C
VITON/CHLOROBUTYL	C

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type AK-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	AK-AUS P2	-	AK-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AK-AUS / Class 1 P2	-
up to 100 x ES	-	AK-2 P2	AK-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	Odourless solid (battery); insoluble in water.

Physical state	Manufactured	**Relative density (Water = 1)**	Not Available
Odour	No Odour	**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 Available
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 Applicable	**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 Applicable
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 Applicable	**VOC g/L**	Not Applicable

SECTION 10 Stability and reactivity

Continued...

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
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	Vapors or fumes may cause respiratory tract irritation. Not normally a hazard due to physical form of product.
Ingestion	Considered an unlikely route of entry in commercial/industrial environments Ingestion may result in nausea, abdominal irritation, pain and vomiting
Skin Contact	The electrolyte causes severe skin burns and irritation. Not normally a hazard due to physical form of product.
Eye	The electrolyte causes eye irritation and damage. Not normally a hazard due to physical form of product.
Chronic	The chemicals in this product are contained in a sealed case and exposure does not occur during normal handling and use. Not normally a hazard due to physical form of product.

Lithium-ion Battery - Rechargeable (Brand Ryobi)	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
lithium nickel oxide	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >2000 mg/kg[1]	Not Available
carbon, activated	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
iron	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 98600 mg/kg[2]	Not Available
copper	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: 0.733 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Mouse) LD50; 0.7 mg/kg[2]	
aluminium	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >2.3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
lithium cobaltate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50: 5.05 mg/l4h[1]	
	Oral (Rat) LD50: >5000 mg/kg[1]	
dimethyl carbonate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >5.36 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >5000 mg/kg[1]	
lithium manganate	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
polyethylene	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Not Available
	Oral (Rat) LD50: >2000 mg/kg[1]	

Continued...

ethylene carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit): 20 mg - mild [CCInfo]*
	Oral (Rat) LD50: >2000 mg/kg[1]	Eye: adverse effect observed (irritating)[1]
		Skin (rabbit): 660 mg - moderate
		Skin: no adverse effect observed (not irritating)[1]
lithium fluorophosphate	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 50-300 mg/kg[1]	Not Available
graphite	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >2 mg/L4h[1]	Not Available
	Oral (Rat) LD50: >200 mg/kg[1]	
ethyl methyl carbonate	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >17.6 mg/l4h[1]	Not Available
	Oral (Rat) LD50: >5000 mg/kg[1]	
nickel	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol	**TOXICITY**	**IRRITATION**
	dermal (guinea pig) LD50: >1000 mg/kg[2]	Eye (rabbit): slight ** * [Kodak] ** [Eastman]
	Oral (Rat) LD50: >3200 mg/kg[2]	Skin (rabbit): slight **
polypropylene	**TOXICITY**	**IRRITATION**
	Oral (Mouse) LD50; 3200 mg/kg[2]	Not Available
nickel(II) sulfide	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: 0.924 mg/l4h[1]	Not Available
	Oral (Rat) LD50: >5000 mg/kg[1]	
imide resin	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
silicon	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: 3160 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]
lithium carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit) : Moderate *
	Inhalation(Rat) LC50: >0.8 mg/L4h[2]	Skin (rabbit) : Mild *
	Oral (Rat) LD50: 525 mg/kg[2]	
carbon black	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
styrene/ butadiene copolymer	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >20000 mg/kg[2]	Eye (rabbit) 500: mg/24h -
	Oral (Rat) LD50: 71000 mg/kg[2]	Eye : Mild
poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
sodium carboxymethylcellulose	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Not Available
	Inhalation(Rat) LC50: >5.8 mg/L4h[2]	
	Oral (Guinea) LD50; 16000 mg/kg[2]	

Continued...

succinonitrile	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Mouse) LD50; 129 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]
lithium aluminate	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
lithium nickel manganese cobalt oxide	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
lithium nickel cobalt oxide	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
vinylidene fluoride homopolymer	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
silicon monoxide	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
methyl propionate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Skin (rabbit):500 mg/24h-moderate
	Inhalation(Rat) LC50: >22.7 mg/l4h[1]	
	Oral (Rat) LD50: 5000 mg/kg[2]	
fluoroethylene carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[2]	Not Available
	Oral (Rat) LD50: ~500 mg/kg[1]	
boehmite	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >2.3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
N-methyl-2-pyrrolidone	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 8000 mg/kg[2]	Eye (rabbit): 100 mg - moderate *[Manufacturer]
	Inhalation(Rat) LC50: 3.1-8.8 mg/l4h[2]	
	Oral (Rat) LD50: 3914 mg/kg[2]	
chromium	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >5.41 mg/l4h[1]	Not Available
	Oral (Rat) LD50: >5000 mg/kg[1]	
ethylbenzene	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 17800 mg/kg[2]	Eye (rabbit): 500 mg - SEVERE
	Inhalation(Rat) LC50: 17.2 mg/l4h[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: 3500 mg/kg[2]	Skin (rabbit): 15 mg/24h mild
		Skin: no adverse effect observed (not irritating)[1]
cobalt lithium manganese nickelate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Oral (Rat) LD50: >2000 mg/kg[1]	
ferric oxide	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >5000 mg/kg[1]	Not Available
ethyl acetate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >18000 mg/kg[2]	Eye (human): 400 ppm
	Inhalation(Mouse) LC50; >18 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Mouse) LD50; 4100 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]
cobalt (II) oxide	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]

Continued...

	Inhalation(Rat) LC50: 0.06 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: 202 mg/kg[2]	

manganese dioxide	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: >3478 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]

nickel oxide	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50: >5.08 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >5000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

biphenyl	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >5010 mg/kg[2]	Eye (rabbit): 100 mg - mild
	Inhalation(Mouse) LC50; >0.275 mg/l4h[2]	Eye: adverse effect observed (irritating)[1]
	Oral (Rat) LD50: 2400 mg/kg[2]	Skin: adverse effect observed (irritating)[1]

titanium dioxide	**TOXICITY**	**IRRITATION**
	dermal (hamster) LD50: >=10000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >2.28 mg/l4h[1]	Skin (human): 0.3 mg /3D (int)-mild *
	Oral (Rat) LD50: >=2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

cobalt(III) oxide monohydrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >5000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

cobalt oxide (tetroxide)	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >4.83 mg/l4h[2]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >5000 mg/kg[2]	

magnesite	**TOXICITY**	**IRRITATION**
	Oral (Mouse) LD50; 7000 mg/kg[2]	Not Available

N-lithiotrifluoromethanesulfonimide	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 371 mg/kg[1]	Eye: adverse effect observed (irritating)[1]
	Oral (Rat) LD50: 160 mg/kg[2]	Skin: adverse effect observed (corrosive)[1]

itaconic acid/ 1,3-butadiene/ styrene copolymer	**TOXICITY**	**IRRITATION**
	Not Available	Not Available

adiponitrile	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Not Available
	Inhalation(Rat) LC50: 1.71 mg/L4h[2]	
	Oral (Rabbit) LD50; 22 mg/kg[2]	

lithium iron phosphate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: 2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50: >3.2 mg/l4h[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	

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*

COPPER	WARNING: 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. for copper and its compounds (typically copper chloride): **Acute toxicity:** 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.
LITHIUM COBALTATE	Allergic reactions which develop in the respiratory passages as bronchial asthma or rhinoconjunctivitis, are mostly the result of reactions of the allergen with specific antibodies of the IgE class and belong in their reaction rates to the manifestation of the immediate type. In addition to the allergen-specific potential for causing respiratory sensitisation, the amount of the allergen, the exposure period and the genetically determined disposition of the exposed person are likely to be decisive. Factors which

Continued...

	increase the sensitivity of the mucosa may play a role in predisposing a person to allergy. Particular attention is drawn to so-called atopic diathesis which is characterised by an increased susceptibility to allergic rhinitis, allergic bronchial asthma and atopic eczema (neurodermatitis) which is associated with increased IgE synthesis. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.
POLYETHYLENE	polyethylene pyrolyzate 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.
ETHYLENE CARBONATE	for ethylene carbonate **Mammalian toxicity:** Reliable acute toxicity tests are available on ethylene carbonate. Ethylene carbonate is practically nontoxic following acute oral exposure in a test that meets OECD and EPA test guidelines; the LD50 is >5000 mg/kg. The dermal LD50 is >2000 mg/kg, in a test that meets OECD and EPA test guidelines. Ethylene carbonate is rapidly metabolized to ethylene glycol. For ethylene glycol: Ethylene glycol is quickly and extensively absorbed through the gastrointestinal tract. Limited information suggests that it is also absorbed through the respiratory tract; dermal absorption is apparently slow. Following absorption, ethylene glycol is distributed throughout the body according to total body water.
NICKEL	Oral (rat) TDLo: 500 mg/kg/5D-I Inhalation (rat) TCLo: 0.1 mg/m3/24H/17W-C Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [*National Toxicology Program: U.S. Dep. of Health & Human Services 2002*]
DIMETHYL TEREPHTHALATE/ CYCLOHEXANEDIMETHANOL/ ETH. GLYCOL	For polyethylene terephthalate (PET polyesters) and its derivatives No adverse effects described in animals from short exposures by inhalation, ingestion or skin contact. Animal testing indicates that this compound does not have carcinogenic mutagenic, embryotoxic, nor reproductive effects. * DuPont Acetaldehyde forms by degradation of PET through the mishandling of the material. At high temperatures, (PET decomposes above 300 C or 570 F), high pressures, extruder speeds (excessive shear flow raises temperature) and long barrel residence times all contribute to the production of acetaldehyde.
POLYPROPYLENE	* For pyrolyzate
NICKEL(II) SULFIDE	NOTE: IARC Cancer Review: Animal Sufficient Evidence.
IMIDE RESIN	Polyimides displayed an insignificant level of cell culture cytotoxicity and haemolysis, and in the presence of whole blood, clotting times ranged from 63 to 98% of normal. These clotting times and haemolytic index values were intermediate between the values observed for Teflon and Silastic controls.In addition polyimides adsorbed significant amounts of albumin (2-3 micrograms/cm2) and fibrinogen (0.5-0.8 microgram/cm2). These factors, along with the strong adherence of polyimides to metal oxide substrates, indicate that polyimide materials are good candidates for further testing as encapsulants for implantable biosensors Polyetherimides, based on bisphenol A and its close analogues, represent a potential reproductive hazard (as endocrine disruptors of fertility) to fertility.
SILICON	Intraperitoneal injection of silicon produced only minor local trauma and foreign body reaction. Parenterally administered elemental silica is considered biologically inert. Dogs and rats fed 800 mg silicon/kg/day (as the dioxide) for 1 month showed no clinical signs or histological changes. The compound was largely eliminated in the faeces. Normal human cerebral cortex tissue contains about 3.8 ug/g silicon
LITHIUM CARBONATE	Lacrimation, altered sleep times, hallucinations, distorted perception, toxic psychosis, excitement, ataxia, respiratory depression, allergic dermatitis (after sytemic administration), foetoxicity and foetolethality and specific development abnormalities recorded. Non-sensitising guinea pig * * FMC SDS The material may trigger oculogyric crisis. The term "oculogyric" refers to the bilateral elevation of the visual gaze. Initial symptoms include restlessness, agitation, malaise, or a fixed stare. Then comes the more characteristically described extreme and sustained upward deviation of the eyes.
CARBON BLACK	Inhalation (rat) TCLo: 50 mg/m3/6h/90D-I Nil reported
SODIUM CARBOXYMETHYLCELLULOSE	Neoplastic by RTECS criteria 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. 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
SUCCINONITRILE	Spastic paralysis, convulsions, nausea, changes in urine composition, foetotoxicity, specific developmental abnormalities (central nervous system) recorded.
LITHIUM ALUMINATE	For aluminium compounds: Aluminium present in food and drinking water is poorly absorbed through the gastrointestinal tract. The bioavailability of aluminium is dependent on the form in which it is ingested and the presence of dietary constituents with which the metal cation can complex Ligands in food can have a marked effect on absorption of aluminium, as they can either enhance uptake by forming absorbable (usually water soluble) complexes (e.g., with carboxylic acids such as citric and lactic), or reduce it by forming insoluble compounds (e.g., with phosphate or dissolved silicate). Considering the available human and animal data it is likely that the oral absorption of aluminium can vary 10-fold based on chemical form alone. Although bioavailability appears to generally parallel water solubility, insufficient data are available to directly extrapolate from solubility in water to bioavailability. For oral intake from food, the European Food Safety Authority (EFSA) has derived a tolerable weekly intake (TWI) of 1 milligram (mg) of aluminium per kilogram of bodyweight.
SILICON MONOXIDE	For silica amorphous: Derived No Adverse Effects Level (NOAEL) in the range of 1000 mg/kg/d. In humans, synthetic amorphous silica (SAS) is essentially non-toxic by mouth, skin or eyes, and by inhalation. Epidemiology studies show little evidence of adverse health effects due to SAS. Repeated exposure (without personal protection) may cause mechanical irritation of the eye and drying/cracking of the skin. When experimental animals inhale synthetic amorphous silica (SAS) dust, it dissolves in the lung fluid and is rapidly eliminated.
METHYL PROPIONATE	The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

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FLUOROETHYLENE CARBONATE	A study was performed to assess the skin sensitisation potential of Monofluoroethylene carbonate in the CBA/Ca strain mouse following topical application to the dorsal surface of the ear. The test material was considered to be a sensitiser under the conditions of the test. An inverse dose response relationship was noted in the Stimulation Index results. The reason for this is unknown but could be due to decreased bioactivity of the test material with increasing concentrations in dimethyl formamide, or due to immunosuppression at higher concentrations of test material. Genetic toxicity: in vitro Significant increases of revertant colonies were observed in Salmonella typhimurium TA98 in the presence of metabolic activation system and Salmonella typhimurium TA 100 in the absence and presence of metabolic activation system. It is concluded that Monofluoroethylene carbonate exhibited mutagenic activity in Salmonella typhimurium TA98, TA 100 under the conditions employed for this test. Genetic toxicity: in vivo Monofluoroethylene carbonate was cytotoxic to bone marrow cells, but did not show any indication of chromosomal damage and/or damage to the mitotic apparatus of the bone marrow target cells in female mice, treated intraperitoneally with it is concluded that Monofluoroethylene carbonate was cytotoxic to the bone marrow cells, but did not show any indication of chromosomal damage and/or damage to the mitotic apparatus of the bone marrow target cells in female mice, treated intraperitoneally with monofluoroethylene carbonate, up to 100 mg/kg bw., up to 100 mg/kg bw. *REACh Dossier
N-METHYL-2-PYRROLIDONE	for N-methyl-2-pyrrolidone (NMP): **Acute toxicity:** In rats, NMP is absorbed rapidly after inhalation, oral, and dermal administration, distributed throughout the organism, and eliminated mainly by hydroxylation to polar compounds, which are excreted via urine. About 80% of the administered dose is excreted as NMP and NMP metabolites within 24 h. A probably dose-dependent yellow coloration of the urine in rodents is observed. A substance (or part of a group of chemical substances) of very high concern (SVHC) - or product containing an SVHC: It is proposed that use within the European Union be subject to authorisation under the REACH Regulation.Indeed, listing of a substance as an SVHC by the European Chemicals Agency (ECHA) is the first step in the procedure for authorisation or restriction of use of a chemical. The criteria are given in article 57 of the REACH Regulation. A substance may be proposed as an SVHC if it meets one or more of the following criteria: ▸ it is carcinogenic *; ▸ it is mutagenic *; ▸ it is toxic for reproduction *; ▸ it is persistent, bioaccumulative and toxic (PBT substances); ▸ it is very persistent and very bioaccumulative (vPvB substances); ▸ there is "scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern"; such substances are identified on a case-by-case basis. * Collectively described as CMR substances The "equivalent concern" criterion is significant because it is this classification which allows substances which are, for example, neurotoxic, endocrine-disrupting or otherwise present an unanticipated environmental health risk to be regulated under REACH] Simply because a substance meets one or more of the criteria does not necessarily mean that it will be proposed as an SVHC.
CHROMIUM	Gastrointestinal tumours, lymphoma, musculoskeletal tumours and tumours at site of application recorded. For chrome(III) and other valence states (except hexavalent): For inhalation exposure, all trivalent and other chromium compounds are treated as particulates, not gases. The mechanisms of chromium toxicity are very complex, and although many studies on chromium are available, there is a great deal of uncertainty about how chromium exerts its toxic influence. Much more is known about the mechanisms of hexavalent chromium toxicity than trivalent chromium toxicity. There is an abundance of information available on the carcinogenic potential of chromium compounds and on the genotoxicity and mutagenicity of chromium compounds in experimental systems. Tenth Annual Report on Carcinogens: Substance known to be Carcinogenic [*National Toxicology Program: U.S. Dep. of Health and Human Services 2002*]
ETHYLBENZENE	Liver changes, utheral tract, effects on fertility, foetotoxicity, specific developmental abnormalities (musculoskeletal system) recorded. Ethylbenzene is readily absorbed following inhalation, oral, and dermal exposures, distributed throughout the body, and excreted primarily through urine. There are two different metabolic pathways for ethylbenzene with the primary pathway being the alpha-oxidation of ethylbenzene to 1-phenylethanol, mostly as the R-enantiomer. The pattern of urinary metabolite excretion varies with different mammalian species. **NOTE:** Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.
COBALT (II) OXIDE	Tumorigenic by RTECS criteria
BIPHENYL	Neoplastic by RTECS criteria. for biphenyl: Biphenyl is well absorbed through the gastrointestinal tract and presumably also via lung and skin. In those species examined, the metabolites of biphenyl, mainly 4-hydroxybiphenyl, are excreted rapidly and almost exclusively in the urine. The acute oral toxicity of biphenyl is moderate.
TITANIUM DIOXIDE	* IUCLID Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of appropriate studies using mammalian somatic cells in vivo. For titanium dioxide: Humans can be exposed to titanium dioxide via inhalation, ingestion or dermal contact. In human lungs, the clearance kinetics of titanium dioxide is poorly characterized relative to that in experimental animals. (General particle characteristics and host factors that are considered to affect deposition and retention patterns of inhaled, poorly soluble particles such as titanium dioxide are summarized in the monograph on carbon black.) With regard to inhaled titanium dioxide, human data are mainly available from case reports that showed deposits of titanium dioxide in lung tissue as well as in lymph nodes. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
N-LITHIOTRIFLUOROMETHANESULFONIMIDE	The material may produce respiratory tract irritation. Symptoms of pulmonary irritation may include coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and a burning sensation. Unlike most organs, the lung can respond to a chemical insult or a chemical agent, by first removing or neutralising the irritant and then repairing the damage (inflammation of the lungs may be a consequence). The repair process (which initially developed to protect mammalian lungs from foreign matter and antigens) may, however, cause further damage to the lungs (fibrosis for example) when activated by hazardous chemicals. Often, this results in an impairment of gas exchange, the primary function of the lungs. No indication of mutagenic activity. * Merck MSDS
ADIPONITRILE	For adiponitrile: Oral and inhalation acute toxicity is reported in animal assays. Few reported human cases of skin irritation lead to consider adiponitrile as irritant although such effects on acute dermal exposure are not observed in animals. Adiponitrile is considered as toxic and irritant accordingly. A NOEL of 0.03 mg/l was derived from repeated dose toxicity tests (inhalation route). No genotoxic effects were observed in any systems up to the maximum possible dose.

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LITHIUM NICKEL OXIDE & COPPER & LITHIUM COBALTATE & NICKEL & NICKEL(II) SULFIDE & LITHIUM NICKEL MANGANESE COBALT OXIDE & LITHIUM NICKEL COBALT OXIDE & FLUOROETHYLENE CARBONATE & COBALT LITHIUM MANGANESE NICKELATE & COBALT (II) OXIDE & NICKEL OXIDE & COBALT OXIDE (TETROXIDE)	The following information refers to contact allergens as a group and may not be specific to this product. 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.
LITHIUM NICKEL OXIDE & ETHYLENE CARBONATE & LITHIUM FLUOROPHOSPHATE & GRAPHITE & IMIDE RESIN & SILICON & LITHIUM CARBONATE & SUCCINONITRILE & SILICON MONOXIDE & N-METHYL-2-PYRROLIDONE & FERRIC OXIDE & ETHYL ACETATE & BIPHENYL & TITANIUM DIOXIDE & COBALT OXIDE (TETROXIDE) & N-LITHIOTRIFLUOROMETHANESULFONIMIDE & ADIPONITRILE	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.
CARBON, ACTIVATED & ALUMINIUM & LITHIUM COBALTATE & LITHIUM MANGANATE & LITHIUM FLUOROPHOSPHATE & GRAPHITE & ETHYL METHYL CARBONATE & IMIDE RESIN & SILICON & CARBON BLACK & POLY(ETHYLENE-CO-VINYL ACETATE-CO-CARBON MONOXIDE) LOW DENSITY & LITHIUM ALUMINATE & LITHIUM NICKEL MANGANESE COBALT OXIDE & LITHIUM NICKEL COBALT OXIDE & VINYLIDENE FLUORIDE HOMOPOLYMER & SILICON MONOXIDE & BOEHMITE & CHROMIUM & COBALT LITHIUM MANGANESE NICKELATE & MANGANESE DIOXIDE & TITANIUM DIOXIDE & COBALT(III) OXIDE MONOHYDRATE & ITACONIC ACID/ 1,3-BUTADIENE/ STYRENE COPOLYMER & LITHIUM IRON PHOSPHATE	No significant acute toxicological data identified in literature search.
CARBON, ACTIVATED & POLYETHYLENE & POLYPROPYLENE & STYRENE/ BUTADIENE COPOLYMER & CHROMIUM	The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
LITHIUM COBALTATE & LITHIUM CARBONATE & LITHIUM ALUMINATE & LITHIUM NICKEL MANGANESE COBALT OXIDE & LITHIUM NICKEL COBALT OXIDE & N-LITHIOTRIFLUOROMETHANESULFONIMIDE & 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, i.e., a goitre Goitrogens include: ▸ Vitexin, a flavanoid, which inhibits thyroid peroxidase thus contributing to goiter. ▸ Ions such as thiocyanate and perchlorate which decrease iodide uptake by competitive inhibition; as a consequence of reduced thyroxine and triiodothyronine secretion by the gland, at low doses, this causes an increased release of thyrotropin (by reduced negative feedback), which then stimulates the gland.
POLYETHYLENE & POLYPROPYLENE	for poly-alpha-olefins (PAOs): 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. Read across data exist for health effects endpoints from the following similar *hydrogenated* long chain branched alkanes derived from a C8, C10, and/or C12 alpha olefins: ▸ Decene homopolymer ▸ Decene/dodecene copolymer ▸ Octene/decene/dodecene copolymer ▸ Dodecene trimer The data for these structural analogs demonstrated no evidence of health effects.
ETHYLENE CARBONATE & ETHYLBENZENE	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
ETHYLENE CARBONATE & ETHYLBENZENE & TITANIUM DIOXIDE	The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.
NICKEL & CARBON BLACK & ETHYLBENZENE & COBALT (II) OXIDE & TITANIUM DIOXIDE	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
SILICON & STYRENE/ BUTADIENE COPOLYMER & BIPHENYL	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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*

Continued...

SECTION 12 Ecological information

Toxicity

Lithium-ion Battery - Rechargeable (Brand Ryobi)

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

lithium nickel oxide

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

carbon, activated

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72h	Algae or other aquatic plants	50mg/L	4

iron

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	48h	Algae or other aquatic plants	0.1-4mg/l	4
EC50	72h	Algae or other aquatic plants	18mg/l	2
LC50	96h	Fish	0.00499-0.00819mg/l	4
EC50	48h	Crustacea	>100mg/l	2

copper

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	48h	Fish	0.00009mg/l	4
EC50	96h	Algae or other aquatic plants	0.03-0.058mg/l	4
EC50	72h	Algae or other aquatic plants	0.011-0.017mg/L	4
LC50	96h	Fish	0.0028mg/l	2
EC50	48h	Crustacea	0.0006-0.0017mg/l	4

aluminium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	48h	Crustacea	>100mg/l	1
EC50	96h	Algae or other aquatic plants	0.0054mg/l	2
EC50	72h	Algae or other aquatic plants	0.0169mg/l	2
LC50	96h	Fish	0.078-0.108mg/l	2
EC50	48h	Crustacea	0.7364mg/l	2

lithium cobaltate

Endpoint	Test Duration (hr)	Species	Value	Source
EC10(ECx)	168h	Algae or other aquatic plants	0.00123mg/l	2
EC50	96h	Algae or other aquatic plants	23.8mg/l	2
LC50	96h	Fish	0.8mg/l	2
EC50	72h	Algae or other aquatic plants	0.0288mg/l	2
EC50	48h	Crustacea	0.241mg/l	2

dimethyl carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	504h	Crustacea	25mg/l	2
EC50	72h	Algae or other aquatic plants	>57.29mg/l	2
LC50	96h	Fish	>=100mg/l	2
EC50	96h	Algae or other aquatic plants	166.6-211mg/l	2
EC50	48h	Crustacea	>74.16mg/l	2

lithium manganate

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

ethylene carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72h	Algae or other aquatic plants	100mg/l	2
EC50	72h	Algae or other aquatic plants	>100mg/l	2
EC50	48h	Crustacea	>100mg/l	2
LC50	96h	Fish	>100mg/l	2

lithium fluorophosphate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	528h	Fish	0.2mg/l	2

Continued...

	EC50	72h	Algae or other aquatic plants	62mg/l	2
	EC50	96h	Algae or other aquatic plants	43mg/l	2
	EC50	48h	Crustacea	98mg/l	2
	LC50	96h	Fish	42mg/l	2

graphite	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	48h	Crustacea	>=100mg/l	2
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	LC50	96h	Fish	>100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2

ethyl methyl carbonate	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	72h	Algae or other aquatic plants	62mg/l	2
	EC50	72h	Algae or other aquatic plants	>62mg/l	2
	LC50	96h	Fish	>100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2

nickel	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50(ECx)	72h	Algae or other aquatic plants	0.18mg/l	1
	EC50	96h	Algae or other aquatic plants	0.174-0.311mg/l	4
	EC50	72h	Algae or other aquatic plants	0.18mg/l	1
	LC50	96h	Fish	0.06mg/l	4
	EC50	48h	Crustacea	>100mg/l	1

dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	>100mg/l	Not Available

polypropylene	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available

nickel(II) sulfide	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	96h	Algae or other aquatic plants	0.36mg/l	2
	EC50	48h	Crustacea	0.09731mg/l	2
	EC10(ECx)	720h	Crustacea	0.0011mg/l	2
	LC50	96h	Fish	0.35mg/l	2
	EC50	72h	Algae or other aquatic plants	0.0407mg/l	2

imide resin	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available

silicon	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC10(ECx)	1.28h	Algae or other aquatic plants	>=66<=88mg/l	2
	EC50	72h	Algae or other aquatic plants	~250mg/l	2

lithium carbonate	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50(ECx)	48h	Crustacea	33.2mg/l	Not Available
	EC50	72h	Algae or other aquatic plants	>400mg/l	2
	LC50	96h	Fish	30.3mg/l	Not Available
	EC50	48h	Crustacea	33.2mg/l	Not Available

carbon black	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	>100mg/l	2
	EC50	72h	Algae or other aquatic plants	>0.2mg/l	2
	EC50	48h	Crustacea	33.076-41.968mg/l	4
	NOEC(ECx)	24h	Crustacea	3200mg/l	1

styrene/ butadiene copolymer	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available

Continued...

poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density

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
EC50(ECx)	48h	Crustacea	46.04-165.37mg/l	4
EC50	48h	Crustacea	46.04-165.37mg/l	4
LC50	96h	Fish	>20000mg/l	4

succinonitrile

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>100mg/l	2
EC50	48h	Crustacea	>100mg/l	2
NOEC(ECx)	504h	Crustacea	0.784mg/l	2

lithium aluminate

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

lithium nickel manganese cobalt oxide

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

lithium nickel cobalt oxide

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

silicon monoxide

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

methyl propionate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	504h	Crustacea	3.2mg/L	5
EC50	72h	Algae or other aquatic plants	>500mg/l	2
EC50	96h	Algae or other aquatic plants	>500mg/l	4

fluoroethylene carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	6-60mg/l	Not Available
EC50	72h	Algae or other aquatic plants	6.3mg/l	2
EC50	48h	Crustacea	8.4mg/l	Not Available
NOEC(ECx)	48h	Crustacea	2.8mg/l	Not Available

boehmite

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.078-0.108mg/l	2
EC50	72h	Algae or other aquatic plants	0.2mg/l	2
EC50	48h	Crustacea	1.5mg/l	2
NOEC(ECx)	72h	Algae or other aquatic plants	>=0.004mg/l	2
EC50	96h	Algae or other aquatic plants	0.024mg/l	2

N-methyl-2-pyrrolidone

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	504h	Crustacea	12.5mg/l	2
EC50	72h	Algae or other aquatic plants	>500mg/l	1
LC50	96h	Fish	464mg/l	1
EC50	48h	Crustacea	ca.4897mg/l	1

chromium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	672h	Fish	0.00019mg/l	4
EC50	96h	Algae or other aquatic plants	36mg/L	4
EC50	72h	Algae or other aquatic plants	0.026-0.208mg/L	4

Continued...

	LC50	96h	Fish	0.106mg/L	4
	EC50	48h	Crustacea	<0.001mg/l	2

ethylbenzene

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	3.381-4.075mg/L	4
EC50	72h	Algae or other aquatic plants	2.4-9.8mg/l	4
EC50	48h	Crustacea	1.37-4.4mg/l	4
EC50(ECx)	24h	Algae or other aquatic plants	0.02-938mg/l	4
EC50	96h	Algae or other aquatic plants	1.7-7.6mg/l	4

cobalt lithium manganese nickelate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	>1mg/l	2
NOEC(ECx)	672h	Fish	>0.1<=1mg/l	2

ferric oxide

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.05mg/l	2
EC50	72h	Algae or other aquatic plants	18mg/l	2
EC50	48h	Crustacea	>100mg/l	2
NOEC(ECx)	504h	Fish	0.52mg/l	2

ethyl acetate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>75.6mg/l	2
EC50	72h	Algae or other aquatic plants	1800-3200mg/l	4
EC50	48h	Crustacea	164mg/l	1
EC50	96h	Algae or other aquatic plants	2500mg/l	4
NOEC(ECx)	72h	Algae or other aquatic plants	>100mg/l	1

cobalt (II) oxide

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	0.8mg/l	2
EC50	72h	Algae or other aquatic plants	0.0288mg/l	2
EC50	48h	Crustacea	0.241mg/l	2
EC10(ECx)	168h	Algae or other aquatic plants	0.00123mg/l	2
EC50	96h	Algae or other aquatic plants	23.8mg/l	2

manganese dioxide

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	1560h	Fish	0.55mg/l	2

nickel oxide

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96h	Fish	>100mg/l	Not Available
EC50	72h	Algae or other aquatic plants	0.0407mg/l	2
EC50	48h	Crustacea	>100mg/l	Not Available
EC50(ECx)	48h	Crustacea	>100mg/l	Not Available
EC50	96h	Algae or other aquatic plants	0.0078mg/l	2

biphenyl

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	48h	Crustacea	0.04mg/l	4
EC50	96h	Algae or other aquatic plants	1.3mg/l	2
EC50	72h	Algae or other aquatic plants	0.78mg/l	2
EC50	48h	Crustacea	0.63-0.85mg/l	4
LC50	96h	Fish	1.17-1.81mg/l	4

titanium dioxide

Endpoint	Test Duration (hr)	Species	Value	Source
BCF	1008h	Fish	<1.1-9.6	7
LC50	96h	Fish	1.85-3.06mg/l	4
EC50	72h	Algae or other aquatic plants	3.75-7.58mg/l	4
EC50	48h	Crustacea	1.9mg/l	2
EC50	96h	Algae or other aquatic plants	179.05mg/l	2
NOEC(ECx)	504h	Crustacea	0.02mg/l	4

Continued...

cobalt(III) oxide monohydrate	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	0.8mg/l	2
	EC50	72h	Algae or other aquatic plants	0.0288mg/l	2
	EC50	48h	Crustacea	0.241mg/l	2
	EC10(ECx)	168h	Algae or other aquatic plants	0.00123mg/l	2
	EC50	96h	Algae or other aquatic plants	23.8mg/l	2
cobalt oxide (tetroxide)	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	0.8mg/l	2
	EC50	72h	Algae or other aquatic plants	88mg/l	1
	EC50	48h	Crustacea	>136mg/l	1
	NOEC(ECx)	72h	Algae or other aquatic plants	9.8mg/l	1
	EC50	96h	Algae or other aquatic plants	23.8mg/l	2
magnesite	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	72h	Algae or other aquatic plants	18.5mg/l	2
	EC50	72h	Algae or other aquatic plants	>18.5mg/l	2
	LC50	96h	Fish	2120mg/l	2
N-lithiotrifluoromethanesulfonimide	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	48h	Crustacea	3.2mg/l	2
	EC50	72h	Algae or other aquatic plants	36mg/l	2
	EC50	48h	Crustacea	14mg/l	2
	LC50	96h	Fish	88.4mg/l	2
itaconic acid/ 1,3-butadiene/ styrene copolymer	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available
adiponitrile	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	670mg/l	2
	EC50	72h	Algae or other aquatic plants	>97.4mg/l	2
	EC50	48h	Crustacea	>1000mg/l	1
	NOEC(ECx)	72h	Algae or other aquatic plants	>100mg/l	1
lithium iron phosphate	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	LC50	96h	Fish	>28mg/l	2
	EC50	72h	Algae or other aquatic plants	>24mg/l	2
	EC50	48h	Crustacea	>28mg/l	2
	NOEC(ECx)	72h	Algae or other aquatic plants	>=24mg/l	2

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*

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
dimethyl carbonate	HIGH	HIGH
polyethylene	LOW	LOW
ethylene carbonate	HIGH	HIGH
ethyl methyl carbonate	HIGH	HIGH
polypropylene	LOW	LOW
lithium carbonate	LOW	LOW
succinonitrile	LOW	LOW
vinylidene fluoride homopolymer	LOW	LOW
methyl propionate	LOW	LOW
N-methyl-2-pyrrolidone	LOW	LOW
ethylbenzene	HIGH (Half-life = 228 days)	LOW (Half-life = 3.57 days)
ethyl acetate	LOW (Half-life = 14 days)	LOW (Half-life = 14.71 days)
biphenyl	LOW (Half-life = 14 days)	LOW (Half-life = 4.58 days)
titanium dioxide	HIGH	HIGH

Continued...

Ingredient	Persistence: Water/Soil	Persistence: Air
magnesite	LOW	LOW
adiponitrile	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
dimethyl carbonate	LOW (LogKOW = 0.2336)
polyethylene	LOW (LogKOW = 1.2658)
ethylene carbonate	LOW (LogKOW = -0.3388)
ethyl methyl carbonate	LOW (LogKOW = 0.7247)
polypropylene	LOW (LogKOW = 1.6783)
lithium carbonate	LOW (LogKOW = -0.4605)
succinonitrile	LOW (LogKOW = -0.99)
vinylidene fluoride homopolymer	LOW (LogKOW = 1.24)
methyl propionate	LOW (LogKOW = 0.84)
boehmite	LOW (BCF = 231)
N-methyl-2-pyrrolidone	LOW (BCF = 0.16)
ethylbenzene	LOW (BCF = 79.43)
ethyl acetate	HIGH (BCF = 3300)
biphenyl	MEDIUM (LogKOW = 3.98)
titanium dioxide	LOW (BCF = 10)
magnesite	LOW (LogKOW = -0.4605)
adiponitrile	LOW (BCF = 1)

Mobility in soil

Ingredient	Mobility
dimethyl carbonate	LOW (KOC = 8.254)
polyethylene	LOW (KOC = 14.3)
ethylene carbonate	LOW (KOC = 9.168)
ethyl methyl carbonate	LOW (KOC = 15.22)
polypropylene	LOW (KOC = 23.74)
lithium carbonate	HIGH (KOC = 1)
succinonitrile	LOW (KOC = 28.23)
vinylidene fluoride homopolymer	LOW (KOC = 35.04)
methyl propionate	LOW (KOC = 6.423)
N-methyl-2-pyrrolidone	LOW (KOC = 20.94)
ethylbenzene	LOW (KOC = 517.8)
ethyl acetate	LOW (KOC = 6.131)
biphenyl	LOW (KOC = 6250)
titanium dioxide	LOW (KOC = 23.74)
magnesite	HIGH (KOC = 1)
adiponitrile	LOW (KOC = 96.05)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	▸ Recycle wherever possible or consult manufacturer for recycling options. ▸ Consult State Land Waste Management Authority for disposal.

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO
HAZCHEM	2Y

Land transport (ADG)

Continued...

UN number or ID number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class(es)	Class: 9 Subsidiary risk: Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: 188 230 310 348 376 377 384 387 390 Limited quantity: 0

Air transport (ICAO-IATA / DGR)

UN number	3480
UN proper shipping name	Lithium ion batteries (including lithium ion polymer batteries)
Transport hazard class(es)	ICAO/IATA Class: 9 ICAO / IATA Subrisk: Not Applicable ERG Code: 12FZ
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	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)

UN number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class(es)	IMDG Class: 9 IMDG Subrisk: Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-A, S-I Special provisions: 188 230 310 348 376 377 384 387 Limited Quantities: 0

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

Not Applicable

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

Product name	Group
lithium nickel oxide	Not Available
carbon, activated	Not Available
iron	Not Available
copper	Not Available
aluminium	Not Available
lithium cobaltate	Not Available
dimethyl carbonate	Not Available
lithium manganate	Not Available
polyethylene	Not Available
ethylene carbonate	Not Available
lithium fluorophosphate	Not Available
graphite	Not Available
ethyl methyl carbonate	Not Available
nickel	Not Available

Continued...

Product name	Group
dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol	Not Available
polypropylene	Not Available
nickel(II) sulfide	Not Available
imide resin	Not Available
silicon	Not Available
lithium carbonate	Not Available
carbon black	Not Available
styrene/ butadiene copolymer	Not Available
poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density	Not Available
sodium carboxymethylcellulose	Not Available
succinonitrile	Not Available
lithium aluminate	Not Available
lithium nickel manganese cobalt oxide	Not Available
lithium nickel cobalt oxide	Not Available
vinylidene fluoride homopolymer	Not Available
silicon monoxide	Not Available
methyl propionate	Not Available
fluoroethylene carbonate	Not Available
boehmite	Not Available
N-methyl-2-pyrrolidone	Not Available
chromium	Not Available
ethylbenzene	Not Available
cobalt lithium manganese nickelate	Not Available
ferric oxide	Not Available
ethyl acetate	Not Available
cobalt (II) oxide	Not Available
manganese dioxide	Not Available
nickel oxide	Not Available
biphenyl	Not Available
titanium dioxide	Not Available
cobalt(III) oxide monohydrate	Not Available
cobalt oxide (tetroxide)	Not Available
magnesite	Not Available
N-lithiotrifluoromethanesulfonimide	Not Available
itaconic acid/ 1,3-butadiene/ styrene copolymer	Not Available
adiponitrile	Not Available
lithium iron phosphate	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
lithium nickel oxide	Not Available
carbon, activated	Not Available
iron	Not Available
copper	Not Available
aluminium	Not Available
lithium cobaltate	Not Available
dimethyl carbonate	Not Available
lithium manganate	Not Available
polyethylene	Not Available
ethylene carbonate	Not Available
lithium fluorophosphate	Not Available
graphite	Not Available
ethyl methyl carbonate	Not Available
nickel	Not Available

Continued...

Product name	Ship Type
dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol	Not Available
polypropylene	Not Available
nickel(II) sulfide	Not Available
imide resin	Not Available
silicon	Not Available
lithium carbonate	Not Available
carbon black	Not Available
styrene/ butadiene copolymer	Not Available
poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density	Not Available
sodium carboxymethylcellulose	Not Available
succinonitrile	Not Available
lithium aluminate	Not Available
lithium nickel manganese cobalt oxide	Not Available
lithium nickel cobalt oxide	Not Available
vinylidene fluoride homopolymer	Not Available
silicon monoxide	Not Available
methyl propionate	Not Available
fluoroethylene carbonate	Not Available
boehmite	Not Available
N-methyl-2-pyrrolidone	Not Available
chromium	Not Available
ethylbenzene	Not Available
cobalt lithium manganese nickelate	Not Available
ferric oxide	Not Available
ethyl acetate	Not Available
cobalt (II) oxide	Not Available
manganese dioxide	Not Available
nickel oxide	Not Available
biphenyl	Not Available
titanium dioxide	Not Available
cobalt(III) oxide monohydrate	Not Available
cobalt oxide (tetroxide)	Not Available
magnesite	Not Available
N-lithiotrifluoromethanesulfonimide	Not Available
itaconic acid/ 1,3-butadiene/ styrene copolymer	Not Available
adiponitrile	Not Available
lithium iron phosphate	Not Available

SECTION 15 Regulatory information

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

lithium nickel oxide is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

carbon, activated is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

iron is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

copper is found on the following regulatory lists

Continued...

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

aluminium is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lithium cobaltate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

dimethyl carbonate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

lithium manganate is found on the following regulatory lists

International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

polyethylene is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ethylene carbonate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

lithium fluorophosphate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

graphite is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ethyl methyl carbonate is found on the following regulatory lists

Not Applicable

nickel is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

polypropylene is found on the following regulatory lists

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

nickel(II) sulfide is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

imide resin is found on the following regulatory lists

Not Applicable

silicon is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lithium carbonate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

carbon black is found on the following regulatory lists

Continued...

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

styrene/ butadiene copolymer is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

sodium carboxymethylcellulose is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

succinonitrile is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

lithium aluminate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lithium nickel manganese cobalt oxide is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

lithium nickel cobalt oxide is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

vinylidene fluoride homopolymer is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

silicon monoxide is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

methyl propionate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

fluoroethylene carbonate is found on the following regulatory lists

Not Applicable

boehmite is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

N-methyl-2-pyrrolidone is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

chromium is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ethylbenzene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

cobalt lithium manganese nickelate is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ferric oxide is found on the following regulatory lists

Continued...

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

ethyl acetate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

cobalt (II) oxide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

manganese dioxide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

nickel oxide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

biphenyl is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

titanium dioxide is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

cobalt(III) oxide monohydrate is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

cobalt oxide (tetroxide) is found on the following regulatory lists

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

magnesite is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

N-lithiotrifluoromethanesulfonimide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

itaconic acid/ 1,3-butadiene/ styrene copolymer is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

adiponitrile is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

lithium iron phosphate is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (lithium nickel oxide; lithium manganate; ethyl methyl carbonate; nickel(II) sulfide; imide resin; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; fluoroethylene carbonate; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate; N-lithiotrifluoromethanesulfonimide; lithium iron phosphate)
Canada - DSL	No (lithium nickel oxide; lithium manganate; lithium fluorophosphate; ethyl methyl carbonate; imide resin; lithium aluminate; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; fluoroethylene carbonate; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate)
Canada - NDSL	No (lithium nickel oxide; carbon, activated; iron; copper; aluminium; lithium cobaltate; dimethyl carbonate; lithium manganate; polyethylene; ethylene carbonate; graphite; nickel; dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol; polypropylene; nickel(II) sulfide; imide resin; silicon; lithium carbonate; carbon black; styrene/ butadiene copolymer; poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density; sodium carboxymethylcellulose; succinonitrile; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; vinylidene fluoride homopolymer;

Continued...

National Inventory	Status
	methyl propionate; N-methyl-2-pyrrolidone; chromium; ethylbenzene; cobalt lithium manganese nickelate; ferric oxide; ethyl acetate; cobalt (II) oxide; manganese dioxide; nickel oxide; biphenyl; cobalt oxide (tetroxide); magnesite; N-lithiotrifluoromethanesulfonimide; itaconic acid/ 1,3-butadiene/ styrene copolymer; adiponitrile; lithium iron phosphate)
China - IECSC	No (lithium nickel oxide; lithium manganate; nickel(II) sulfide; imide resin; succinonitrile; lithium aluminate; lithium nickel manganese cobalt oxide; fluoroethylene carbonate; cobalt(III) oxide monohydrate)
Europe - EINEC / ELINCS / NLP	No (lithium nickel oxide; lithium manganate; polyethylene; dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol; polypropylene; imide resin; styrene/ butadiene copolymer; poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density; sodium carboxymethylcellulose; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; vinylidene fluoride homopolymer; cobalt lithium manganese nickelate; itaconic acid/ 1,3-butadiene/ styrene copolymer; lithium iron phosphate)
Japan - ENCS	No (carbon, activated; iron; copper; aluminium; lithium manganate; lithium fluorophosphate; graphite; nickel; imide resin; silicon; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; chromium; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate)
Korea - KECI	No (imide resin; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; cobalt lithium manganese nickelate; itaconic acid/ 1,3-butadiene/ styrene copolymer)
New Zealand - NZIoC	No (lithium fluorophosphate; ethyl methyl carbonate; nickel(II) sulfide; imide resin; lithium aluminate; lithium nickel manganese cobalt oxide; fluoroethylene carbonate; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate; N-lithiotrifluoromethanesulfonimide; lithium iron phosphate)
Philippines - PICCS	No (lithium nickel oxide; lithium cobaltate; lithium manganate; nickel(II) sulfide; imide resin; lithium aluminate; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; fluoroethylene carbonate; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate; N-lithiotrifluoromethanesulfonimide; lithium iron phosphate)
USA - TSCA	No (imide resin; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide)
Taiwan - TCSI	No (imide resin)
Mexico - INSQ	No (lithium nickel oxide; lithium cobaltate; lithium manganate; ethylene carbonate; lithium fluorophosphate; ethyl methyl carbonate; dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol; imide resin; poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density; lithium aluminate; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; vinylidene fluoride homopolymer; silicon monoxide; fluoroethylene carbonate; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate; N-lithiotrifluoromethanesulfonimide; itaconic acid/ 1,3-butadiene/ styrene copolymer; lithium iron phosphate)
Vietnam - NCI	No (lithium cobaltate; imide resin; lithium aluminate; lithium nickel cobalt oxide)
Russia - FBEPH	No (lithium nickel oxide; lithium cobaltate; lithium manganate; lithium fluorophosphate; dimethyl terephthalate/ cyclohexanedimethanol/ eth. glycol; nickel(II) sulfide; imide resin; poly(ethylene-co-vinyl acetate-co-carbon monoxide) low density; lithium aluminate; lithium nickel manganese cobalt oxide; lithium nickel cobalt oxide; silicon monoxide; cobalt lithium manganese nickelate; cobalt(III) oxide monohydrate; N-lithiotrifluoromethanesulfonimide; itaconic acid/ 1,3-butadiene/ styrene copolymer; lithium iron phosphate)
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	09/03/2023
Initial Date	25/12/2021

SDS Version Summary

Version	Date of Update	Sections Updated
4.1	18/05/2022	Physical and chemical properties - Appearance, Identification of the substance / mixture and of the company / undertaking - Synonyms
5.1	09/03/2023	Physical and chemical properties - Appearance, Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

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.

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
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

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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

end of SDS