

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended by  
Commission Regulation (EU) 2020/878



## BATTERY PACK-LI-ION FOR CLL18/CLG18/PLL18

Version	Revision Date:	SDS Number:	Date of last issue: 23.08.2024
2.0	18.11.2024	11433235-00002	Date of first issue: 23.08.2024

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### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product identifier

Trade name : BATTERY PACK-LI-ION FOR CLL18/CLG18/PLL18  
Product code : 5709300920

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

Use of the Sub-  
stance/Mixture : Battery  
Recommended restrictions : Not applicable  
on use

#### 1.3 Details of the supplier of the safety data sheet

Company : Adolf Wuerth GmbH & Co. KG  
Reinhold-Würth-Str. 12-17  
74653 Künzelsau  
Telephone : +49 794015 0  
Telefax : +49 794015 10 00  
E-mail address of person  
responsible for the SDS : isi@wuerth.com

#### 1.4 Emergency telephone number

+49 (0)6132 – 84463

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### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**  
Not a hazardous substance or mixture.

#### 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008)**  
No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required.

#### Additional Labelling

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- EUH210      Safety data sheet available on request.
- EUH208      Contains Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel. May produce an allergic reaction.

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

#### Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel	182442-95-1	Acute Tox. 2; H330 Resp. Sens. 1B; H334 Skin Sens. 1; H317 Muta. 2; H341 Carc. 1A; H350 Repr. 1B; H360FD STOT RE 1; H372 (Lungs, spleen, Kidney) Aquatic Chronic 2; H411  Acute toxicity estimate  Acute inhalation toxicity (dust/mist): 0,05001 mg/l	>= 30 - < 50
Ethylene carbonate	96-49-1 202-510-0	Acute Tox. 4; H302 Eye Irrit. 2; H319 STOT RE 2; H373 (Kidney)	>= 1 - < 10

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		Acute toxicity estimate Acute oral toxicity: 1.900 mg/kg	
Lithium hexafluorophosphate	21324-40-3 244-334-7	Acute Tox. 3; H301 Skin Corr. 1A; H314 Eye Dam. 1; H318 STOT RE 1; H372 (Bone, Teeth) EUH029, EUH071	>= 1 - < 3
		Acute toxicity estimate Acute oral toxicity: 100 mg/kg	

For explanation of abbreviations see section 16.

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.
- Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).
- If inhaled : If inhaled, remove to fresh air.  
Get medical attention if symptoms occur.
- In case of skin contact : Wash with water and soap as a precaution.  
Get medical attention if symptoms occur.
- In case of eye contact : Flush eyes with water as a precaution.  
Get medical attention if irritation develops and persists.
- If swallowed : Not applicable

#### 4.2 Most important symptoms and effects, both acute and delayed

- Risks : May produce an allergic reaction.

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

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Treatment : Treat symptomatically and supportively.

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : None known.

#### 5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Cobalt compounds  
Metal oxides  
Nickel compounds  
Carbon oxides  
Fluorine compounds  
Oxides of phosphorus

#### 5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Not applicable

#### 6.2 Environmental precautions

Environmental precautions : No special environmental precautions required.

#### 6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Not applicable

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### 6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Technical measures : Not applicable  
Local/Total ventilation : Not applicable  
Advice on safe handling : Not applicable  
Do not eat, drink or smoke when using this product.  
Hygiene measures : When using do not eat, drink or smoke.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in accordance with the particular national regulations.  
Ensure proper labeling

Advice on common storage : Do not store with the following product types:  
Strong oxidizing agents

Storage class (TRGS 510) : 11

### 7.3 Specific end use(s)

Specific use(s) : No data available

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Manganese(2+) ion λ <sup>2</sup> -cobalt(2+) ion lithium(1+) ion oxonickel	182442-95-1	AGW (Inhalable fraction)	0,2 mg/m <sup>3</sup> (Manganese)	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			
	Further information: For Permanganates an excursion factor of 1(II) applies., When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		AGW (Alveolate fraction)	0,02 mg/m <sup>3</sup> (Manganese)	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			
	Further information: For Permanganates an excursion factor of 1(II) applies., When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		AGW (Inhalable fraction)	0,03 mg/m <sup>3</sup>	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			

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		Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child, Substance sensitizing through the skin		
		TWA (inhalable fraction)	0,2 mg/m3 (Manganese)	2017/164/EU
	Further information: Indicative			
		TWA (Respirable fraction)	0,05 mg/m3 (Manganese)	2017/164/EU
	Further information: Indicative			
		TWA (Respirable dust)	0,01 mg/m3	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		TWA (inhalable fraction)	0,1 mg/m3	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		MAK (measured as the alveolate fraction)	0,02 mg/m3	DE DFG MAK
	Peak-limit: excursion factor (category): 8; II			
	Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed, Permanganates: Peak limitation category I(1)			
		MAK (inhalable fraction)	0,2 mg/m3	DE DFG MAK
	Peak-limit: excursion factor (category): 8; II			
	Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed, Permanganates: Peak limitation category I(1)			
Copper	7440-50-8	MAK (measured as the alveolate fraction)	0,01 mg/m3	DE DFG MAK
	Peak-limit: excursion factor (category): 2; II			
	Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			
Aluminium	7429-90-5	AGW (Inhalable fraction)	10 mg/m3	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(II)			
	Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		AGW (Alveolate fraction)	1,25 mg/m3	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(II)			
	Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
Lithium hexafluorophosphate	21324-40-3	AGW (Inhalable fraction)	1 mg/m3 (Fluorine)	DE TRGS 900
	Peak-limit: excursion factor (category): 4;(II)			
	Further information: Skin absorption, When there is compliance with the OEL			

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	and biological tolerance values, there is no risk of harming the unborn child			
		TWA	2,5 mg/m <sup>3</sup> (Fluorine)	2000/39/EC
	Further information: Indicative			
		MAK (inhalable fraction)	1 mg/m <sup>3</sup> (Fluorine)	DE DFG MAK
	Peak-limit: excursion factor (category): 4; II			
	Further information: Danger of absorption through the skin, Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			

### Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Phosphoric acid	7664-38-2	TWA	1 mg/m <sup>3</sup>	2000/39/EC
	Further information: Indicative			
		STEL	2 mg/m <sup>3</sup>	2000/39/EC
	Further information: Indicative			
		AGW (Inhalable fraction)	2 mg/m <sup>3</sup>	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(I)			
	Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		MAK (inhalable fraction)	2 mg/m <sup>3</sup>	DE DFG MAK
	Peak-limit: excursion factor (category): 2; I			
	Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			
Hydrofluoric acid	7664-39-3	TWA	1,8 ppm 1,5 mg/m <sup>3</sup>	2000/39/EC
	Further information: Indicative			
		STEL	3 ppm 2,5 mg/m <sup>3</sup>	2000/39/EC
	Further information: Indicative			
		AGW	1 ppm 0,83 mg/m <sup>3</sup>	DE TRGS 900
	Peak-limit: excursion factor (category): 2;(I)			
	Further information: Skin absorption, When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		MAK	1 ppm 0,83 mg/m <sup>3</sup>	DE DFG MAK
	Peak-limit: excursion factor (category): 2; I			
	Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			
Lithium fluoride	7789-24-4	AGW (Inhalable fraction)	1 mg/m <sup>3</sup> (Fluorine)	DE TRGS 900
	Peak-limit: excursion factor (category): 4;(II)			
	Further information: Skin absorption, When there is compliance with the OEL			

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	and biological tolerance values, there is no risk of harming the unborn child			
	AGW (Inhalable fraction)	0,2 mg/m <sup>3</sup> (Lithium)	DE TRGS 900	
Peak-limit: excursion factor (category): 1;(I)				
Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child				
	TWA	2,5 mg/m <sup>3</sup> (Fluorine)	2000/39/EC	
Further information: Indicative				
	MAK (inhalable fraction)	1 mg/m <sup>3</sup> (Fluorine)	DE DFG MAK	
Peak-limit: excursion factor (category): 4; II				
Further information: Danger of absorption through the skin, Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed				
	MAK (inhalable fraction)	0,2 mg/m <sup>3</sup> (Lithium)	DE DFG MAK	
Peak-limit: excursion factor (category): 1; I				
Further information: Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed				

### Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
Aluminium	7429-90-5	Aluminium: 50 µg/g creatinine (Urine)	In case of long-term exposure: after more than one shift	TRGS 903
		Aluminium: 50 µg/g creatinine (Urine)	end of shift, for long-term exposures after several previous shifts	DE DFG BAT
Lithium hexafluorophosphate	21324-40-3	fluoride (Fluorine): 4 mg/l (Urine)	Immediately after exposure or after working hours	TRGS 903
		fluoride: 4 mg/l (Urine)	Immediately after exposition or after working hours	DE DFG BAT

### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
Aluminium	Workers	Inhalation	Long-term local effects	3,72 mg/m <sup>3</sup>
	Consumers	Ingestion	Long-term systemic effects	3,95 mg/kg bw/day
Copper	Consumers	Inhalation	Acute systemic effects	20 mg/m <sup>3</sup>
	Consumers	Skin contact	Acute systemic effects	273 mg/kg bw/day
	Workers	Skin contact	Long-term systemic effects	137 mg/kg bw/day



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	Workers	Inhalation	Acute systemic effects	20 mg/m <sup>3</sup>
	Workers	Skin contact	Acute systemic effects	273 mg/kg bw/day
	Consumers	Skin contact	Long-term systemic effects	137 mg/kg bw/day
Carbon	Workers	Inhalation	Long-term local effects	1,84 mg/m <sup>3</sup>
	Consumers	Inhalation	Long-term local effects	0,9 mg/m <sup>3</sup>
Ethylene carbonate	Workers	Inhalation	Long-term systemic effects	15 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term systemic effects	4,3 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	3,7 mg/m <sup>3</sup>
	Consumers	Skin contact	Long-term systemic effects	2,1 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	2,1 mg/kg bw/day
Lithium hexafluorophosphate	Workers	Inhalation	Long-term systemic effects	0,931 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term systemic effects	0,133 mg/kg bw/day
Dimethyl carbonate	Workers	Inhalation	Long-term systemic effects	17,2 mg/m <sup>3</sup>
	Workers	Inhalation	Acute systemic effects	57 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term systemic effects	5 mg/kg bw/day
	Workers	Inhalation	Acute local effects	57 mg/m <sup>3</sup>
	Workers	Skin contact	Acute systemic effects	66,7 mg/kg bw/day
	Workers	Skin contact	Acute local effects	17,7 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	4,4 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute systemic effects	42,5 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute local effects	42,5 mg/m <sup>3</sup>
	Consumers	Skin contact	Long-term systemic effects	2,5 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	33,3 mg/kg bw/day
	Consumers	Skin contact	Acute local effects	8,9 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	2,5 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	50 mg/kg bw/day
Manganese(2+) ion	Workers	Inhalation	Long-term systemic	0,05 mg/m <sup>3</sup>

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$\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel			effects	
	Consumers	Inhalation	Long-term local effects	0,00006 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	0,05 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute local effects	1,8 mg/m <sup>3</sup>
	Workers	Inhalation	Acute local effects	18,9 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term local effects	0,012 mg/cm <sup>2</sup>
	Consumers	Inhalation	Long-term systemic effects	0,00006 mg/m <sup>3</sup>
	Consumers	Ingestion	Long-term systemic effects	0,011 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	0,37 mg/kg bw/day
Carbonic acid, ethyl methyl ester	Workers	Inhalation	Long-term systemic effects	10,3 mg/m <sup>3</sup>
	Workers	Inhalation	Acute systemic effects	9900 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term systemic effects	2,92 mg/kg bw/day
	Workers	Skin contact	Acute systemic effects	417 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	2,17 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute systemic effects	8900 mg/m <sup>3</sup>
	Consumers	Skin contact	Long-term systemic effects	1,25 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	250 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	1,25 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	250 mg/kg bw/day

### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Aluminium	Sewage treatment plant	20 mg/l
Copper	Fresh water	7,8 µg/l
	Marine water	5,2 µg/l
	Sewage treatment plant	230 µg/l
	Fresh water sediment	87 mg/kg
	Marine sediment	676 mg/kg
	Soil	65 mg/kg
Carbon	Soil	10 mg/kg dry weight (d.w.)
Ethylene carbonate	Fresh water	5,9 mg/l
	Intermittent use/release	59 mg/l
	Marine water	0,59 mg/l

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	Marine water - intermittent	0,059 mg/l
	Fresh water sediment	28,3 mg/kg dry weight (d.w.)
	Marine sediment	2,83 mg/kg dry weight (d.w.)
	Soil	2,2 mg/kg dry weight (d.w.)
Lithium hexafluorophosphate	Fresh water	0,31 mg/l
	Marine water	0,031 mg/l
	Intermittent use/release	0,68 mg/l
	Sewage treatment plant	48 mg/l
	Fresh water sediment	7,73 mg/kg dry weight (d.w.)
	Marine sediment	1,55 mg/kg dry weight (d.w.)
	Soil	13,5 mg/kg dry weight (d.w.)
Dimethyl carbonate	Fresh water	0,5 mg/l
	Marine water	0,05 mg/l
	Intermittent use/release	1 mg/l
	Sewage treatment plant	188 mg/l
Manganese(2+) ion λ <sup>2</sup> -cobalt(2+) ion lithium(1+) ion oxonickel	Fresh water	0,62 µg/l
	Marine water	2,36 µg/l
	Sewage treatment plant	0,37 mg/l
	Fresh water sediment	53,8 mg/kg dry weight (d.w.)
	Marine sediment	69,8 mg/kg dry weight (d.w.)
	Soil	10,9 mg/kg dry weight (d.w.)
Carbonic acid, ethyl methyl ester	Fresh water	0,062 mg/l
	Freshwater - intermittent	0,62 mg/l
	Marine water	0,0062 mg/l
	Sewage treatment plant	76 mg/l
	Fresh water sediment	0,233 mg/kg dry weight (d.w.)
	Marine sediment	0,0233 mg/kg dry weight (d.w.)
	Soil	0,0102 mg/kg dry weight (d.w.)

### 8.2 Exposure controls

#### Engineering measures

Not applicable

#### Personal protective equipment

Eye/face protection : Not applicable

Hand protection

Material : Protective gloves

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Remarks	:	Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!
Skin and body protection	:	Not applicable
Respiratory protection	:	If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection. Equipment should conform to DIN EN 14387
Filter type	:	Combined particulates, acidic gas/vapour and organic vapour type (AE-P)

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### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

Physical state	:	solid
Colour	:	black
Odour	:	none
Odour Threshold	:	No data available
Melting point/freezing point	:	> 300 °C
Initial boiling point and boiling range	:	No data available
Flammability (solid, gas)	:	Not classified as a flammability hazard
Upper explosion limit / Upper flammability limit	:	Not applicable
Lower explosion limit / Lower flammability limit	:	Not applicable
Flash point	:	Not applicable
Auto-ignition temperature	:	Not applicable
Decomposition temperature	:	No data available
pH	:	substance/mixture is non-soluble (in water)

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Viscosity  
Viscosity, kinematic : Not applicable

Solubility(ies)  
Water solubility : Not applicable

Partition coefficient: n-  
octanol/water : Not applicable

Vapour pressure : Not applicable

Density : No data available

Relative vapour density : Not applicable

Particle characteristics  
Particle size : No data available

### 9.2 Other information

Explosives : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Evaporation rate : Not applicable

---

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Not classified as a reactivity hazard.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : Can react with strong oxidizing agents.  
Hazardous decomposition products will be formed upon contact with water or humid air.

### 10.4 Conditions to avoid

Conditions to avoid : Exposure to moisture

### 10.5 Incompatible materials

Materials to avoid : Oxidizing agents  
Water

### 10.6 Hazardous decomposition products

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Contact with water or humid air : Phosphoric acid  
Hydrofluoric acid  
Lithium fluoride

### SECTION 11: Toxicological information

#### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Information on likely routes of exposure : Skin contact  
Ingestion  
Eye contact

##### Acute toxicity

Not classified based on available information.

##### Product:

Acute oral toxicity : Acute toxicity estimate: > 2.000 mg/kg  
Method: Calculation method

Acute inhalation toxicity : Assessment: The substance or mixture has no acute inhalation toxicity  
Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

##### Components:

##### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

Acute oral toxicity : LD50 (Rat, female): > 2.000 mg/kg  
Method: OECD Test Guideline 420  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : Acute toxicity estimate (Rat, male): 0,05001 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: Expert judgement

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

##### **Ethylene carbonate:**

Acute oral toxicity : Acute toxicity estimate: 1.900 mg/kg  
Method: Expert judgement  
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 0,73 mg/l  
Exposure time: 8 h  
Test atmosphere: vapour

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Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg  
Method: OECD Test Guideline 402

### **Lithium hexafluorophosphate:**

Acute oral toxicity : LD50 (Rat): > 50 - 300 mg/kg  
Method: OECD Test Guideline 423

Acute inhalation toxicity : Assessment: Corrosive to the respiratory tract.

### **Skin corrosion/irritation**

Not classified based on available information.

### **Product:**

Result : No skin irritation  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5  
UN GHS/CLP article 12

### **Components:**

#### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

#### **Ethylene carbonate:**

Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

#### **Lithium hexafluorophosphate:**

Species : reconstructed human epidermis (RhE)  
Method : OECD Test Guideline 431

Result : Corrosive after 3 minutes or less of exposure

### **Serious eye damage/eye irritation**

Not classified based on available information.

### **Product:**

Result : No eye irritation  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5  
UN GHS/CLP article 12

### **Components:**

#### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

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Species : Rabbit  
Method : OECD Test Guideline 405  
Result : No eye irritation

### Ethylene carbonate:

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : Irritation to eyes, reversing within 21 days

### Lithium hexafluorophosphate:

Result : Irreversible effects on the eye  
Remarks : Based on skin corrosivity.

### Respiratory or skin sensitisation

#### Skin sensitisation

Not classified based on available information.

#### Respiratory sensitisation

Not classified based on available information.

### Product:

Assessment : Does not cause skin sensitisation.  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5  
UN GHS/CLP article 12

Assessment : Does not cause respiratory sensitisation.  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5  
UN GHS/CLP article 12

### Components:

#### Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:

Exposure routes : Skin contact  
Species : Humans  
Result : positive  
Remarks : Based on data from similar materials

Assessment : Probability or evidence of skin sensitisation in humans

Exposure routes : Inhalation  
Species : Humans  
Result : positive  
Remarks : Based on data from similar materials

Assessment : Probability or evidence of low to moderate respiratory sensitisation rate in humans

### Ethylene carbonate:



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Test Type	: Buehler Test
Exposure routes	: Skin contact
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: negative

### Lithium hexafluorophosphate:

Test Type	: Local lymph node assay (LLNA)
Exposure routes	: Skin contact
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: negative

### Germ cell mutagenicity

Not classified based on available information.

### Components:

#### Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:

Genotoxicity in vitro	: Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative
-----------------------	---

Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

Genotoxicity in vivo	: Test Type: In vivo mammalian alkaline comet assay Species: Rat Application Route: inhalation (dust/mist/fume) Result: positive Remarks: Based on data from similar materials
----------------------	--

Test Type: In vivo mammalian alkaline comet assay  
Species: Mouse  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Mutagenicity (in vivo mammalian bone-marrow  
cytogenetic test, chromosomal analysis)  
Species: Mouse  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Rodent dominant lethal test (germ cell) (in vivo)

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Species: Mouse  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

Germ cell mutagenicity- Assessment : Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

### Ethylene carbonate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

### Lithium hexafluorophosphate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro  
Result: positive  
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

Germ cell mutagenicity- Assessment : Weight of evidence does not support classification as a germ cell mutagen.

### Carcinogenicity

Not classified based on available information.

### Product:

Result : negative  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5

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UN GHS/CLP article 12

### Components:

#### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

Species : Rat  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 105 weeks  
Result : positive  
Remarks : Based on data from similar materials

Species : Mouse  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 105 weeks  
Result : positive  
Remarks : Based on data from similar materials

Species : Rat  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 2 Years  
Result : positive  
Remarks : Based on data from similar materials

Carcinogenicity - Assessment : Positive evidence from human epidemiological studies

#### **Reproductive toxicity**

Not classified based on available information.

### Product:

Effects on fertility : Result: negative  
Remarks: Based on bioavailability assessment according to  
1.3.2.4.5 UN GHS/CLP article 12

Effects on foetal development : Result: negative  
Remarks: Based on bioavailability assessment according to  
1.3.2.4.5 UN GHS/CLP article 12

### Components:

#### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

Effects on fertility : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development  
Species: Mouse  
Application Route: Ingestion  
Result: positive

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Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development  
Species: Mouse  
Application Route: inhalation (dust/mist/fume)  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: inhalation (dust/mist/fume)  
Result: positive  
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive  
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments., Clear evidence of adverse effects on development, based on animal experiments.

### Ethylene carbonate:

Effects on fertility : Test Type: Three-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rabbit  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

### Lithium hexafluorophosphate:

Effects on fertility : Test Type: Two-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

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### STOT - single exposure

Not classified based on available information.

### STOT - repeated exposure

Not classified based on available information.

### Product:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Remarks	:	Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

### Components:

#### Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:

Exposure routes	:	inhalation (dust/mist/fume)
Target Organs	:	Lungs, spleen, Kidney
Assessment	:	Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

#### Ethylene carbonate:

Exposure routes	:	Ingestion
Target Organs	:	Kidney
Assessment	:	May cause damage to organs through prolonged or repeated exposure.
Remarks	:	Based on data from similar materials

#### Lithium hexafluorophosphate:

Exposure routes	:	Ingestion
Target Organs	:	Bone, Teeth
Assessment	:	Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Exposure routes	:	inhalation (gas)
Target Organs	:	Bone, Teeth
Assessment	:	Shown to produce significant health effects in animals at concentrations of 50 ppmV/6h/d or less.

### Repeated dose toxicity

### Components:

#### Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:

Species	:	Rat
NOAEL	:	15 mg/kg
Application Route	:	Ingestion
Exposure time	:	28 Days
Method	:	OECD Test Guideline 407

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Species : Rat  
LOAEL : 0,00025 mg/kg  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 90 Days  
Method : OECD Test Guideline 413

### Ethylene carbonate:

Species : Rat  
NOAEL : > 150 mg/kg  
Application Route : Ingestion  
Exposure time : 90 Days  
Remarks : Based on data from similar materials

### Lithium hexafluorophosphate:

Species : Rat  
LOAEL : < 50 ppm  
Application Route : inhalation (gas)  
Exposure time : 1 Months  
Remarks : Based on data from similar materials

### Aspiration toxicity

Not classified based on available information.

## 11.2 Information on other hazards

### Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### Experience with human exposure

#### Components:

#### Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:

Inhalation : Target Organs: Respiratory system  
Symptoms: Tumour  
Remarks: Based on data from similar materials

#### Ethylene carbonate:

Ingestion : Target Organs: Kidney

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### SECTION 12: Ecological information

#### 12.1 Toxicity

##### Product:

##### Ecotoxicology Assessment

##### Components:

##### **Manganese(2+) ion $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel:**

Toxicity to fish : LL50 (Pimephales promelas (fathead minnow)): > 100 mg/l  
Exposure time: 96 h  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

Toxicity to daphnia and other aquatic invertebrates : EL50 (Ceriodaphnia dubia (water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

Toxicity to algae/aquatic plants : EL50 (Champia parvula (marine algae)): > 10 - 100 mg/l  
Exposure time: 7 d  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

EL10 (Champia parvula (marine algae)): > 0,1 - 1 mg/l  
Exposure time: 7 d  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

Toxicity to fish (Chronic toxicity) : NOELR: > 1 mg/l  
Exposure time: 32 d  
Species: Pimephales promelas (fathead minnow)  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EL10: > 0,1 - 1 mg/l  
Exposure time: 7 d  
Species: Ceriodaphnia dubia (water flea)  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

##### **Ethylene carbonate:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

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Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 : > 1.000 mg/l  
Exposure time: 30 min  
Method: OECD Test Guideline 209

### **Lithium hexafluorophosphate:**

Toxicity to fish : LC50 : > 10 - 100 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 : > 10 - 100 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to microorganisms : NOEC : > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: > 1 - 10 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Remarks: Based on data from similar materials

## 12.2 Persistence and degradability

### **Components:**

#### **Ethylene carbonate:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 92,7 %  
Exposure time: 29 d  
Method: OECD Test Guideline 301B

#### **Lithium hexafluorophosphate:**

Biodegradability : Result: rapidly degradable



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### 12.3 Bioaccumulative potential

#### Components:

##### Ethylene carbonate:

Partition coefficient: n- : log Pow: 0,11  
octanol/water

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

#### Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### 12.6 Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

No data available

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.  
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.  
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.  
Do not dispose of waste into sewer.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

Waste Code : The following Waste Codes are only suggestions:

used product  
16 06 05\*, other batteries and accumulators

unused product  
16 06 05\*, other batteries and accumulators

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uncleaned packagings  
15 01 10\*, packaging containing residues of or contaminated  
by hazardous substances

### SECTION 14: Transport information

#### 14.1 UN number or ID number

ADN	:	UN 3480
ADR	:	UN 3480
RID	:	UN 3480
IMDG	:	UN 3480
IATA (Cargo)	:	UN 3480
IATA (Passenger)	:	UN 3480 Not permitted for transport

#### 14.2 UN proper shipping name

ADN	:	LITHIUM ION BATTERIES
ADR	:	LITHIUM ION BATTERIES
RID	:	LITHIUM ION BATTERIES
IMDG	:	LITHIUM ION BATTERIES
IATA (Cargo)	:	Lithium ion batteries
IATA (Passenger)	:	Lithium ion batteries Not permitted for transport

#### 14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADN	:	9
ADR	:	9
RID	:	9
IMDG	:	9
IATA (Cargo)	:	9 LITH_BAT_M
IATA (Passenger)	:	Not permitted for transport

#### 14.4 Packing group

ADN	:	
Packing group	:	Not assigned by regulation
Classification Code	:	M4
Labels	:	LITH_BAT_M
Remarks	:	Transport in accordance with special regulation 188

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### ADR

Packing group : Not assigned by regulation  
Classification Code : M4  
Labels : LITH\_BAT\_M  
Tunnel restriction code : (E)  
Remarks : Transport in accordance with special regulation 188

### RID

Packing group : Not assigned by regulation  
Classification Code : M4  
Hazard Identification Number : 90  
Labels : LITH\_BAT\_M  
Remarks : Transport in accordance with special regulation 188

### IMDG

Packing group : Not assigned by regulation  
Labels : LITH\_BAT\_M  
EmS Code : F-A, S-I  
Remarks : Transport in accordance with special regulation 188

### IATA (Cargo)

Packing instruction (cargo aircraft) : 965  
Packing group : Not assigned by regulation  
Labels : Lithium battery,

IATA (Passenger) : Not permitted for transport

## 14.5 Environmental hazards

### ADN

Environmentally hazardous : no

### ADR

Environmentally hazardous : no

### RID

Environmentally hazardous : no

### IMDG

Marine pollutant : no

## 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## 14.7 Maritime transport in bulk according to IMO instruments

Remarks : Not applicable for product as supplied.

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### SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:  
Number on list 27: Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel

Number on list 75: If you intend to use this product as tattoo ink, please contact your vendor.

Substance(s) or mixture(s) are listed here according to their appearance in the regulation, irrespective of their use/purpose or the conditions of the restriction. Please refer to the conditions in corresponding Regulation to determine whether an entry is applicable to the placing on the market or not.

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59) : Not applicable

Regulation (EC) on substances that deplete the ozone layer : Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Not applicable

Regulation (EU) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. : Not applicable

Water hazard class (Germany) : WGK 3 highly hazardous to water

Classification according to AwSV, Annex 1 (5.2)

TA Luft List (Germany) : 5.2.1: Total dust:

Not applicable

5.2.2: Inorganic substances in powdered form:

Class 2: 45 % Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel

Class 3: 56 % Copper, Lithium hexafluorophosphate, Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel

5.2.4: Inorganic substances in gaseous form:

Not applicable

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### 5.2.5: Organic Substances:

Not applicable

### 5.2.7.1.1: Carcinogenic substance:

Class 2: 45 % Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel

### 5.2.7.1.1: Quartz fine dust PM4:

Not applicable

### 5.2.7.1.1: Formaldehyde:

Not applicable

### 5.2.7.1.1: fibres:

Not applicable

5.2.7.2: Poorly degradable, easily enrichable and highly toxic organic substances:

Not applicable

Volatile organic compounds : Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)  
Remarks: Not applicable

### Other regulations:

Contains a substance which is subject to the TRGS 905 list of carcinogenic, germ cell mutagenic and reproductive toxic substances.

: Manganese(2+) ion  $\lambda^2$ -cobalt(2+) ion lithium(1+) ion oxonickel  
carcinogenic: category 2 according to Annex I of the CLP Directive  
mutagenic: based on the available data no classification in the categories of Annex I of the CLP Directive could be made  
Harmful for fertility: based on the available data no classification in the categories of Annex I of the CLP Directive could be made  
Harmful for development: based on the available data no classification in the categories of Annex I of the CLP Directive could be made

## 15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

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## SECTION 16: Other information

Other information : Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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### Full text of H-Statements

H301 : Toxic if swallowed.  
H302 : Harmful if swallowed.  
H314 : Causes severe skin burns and eye damage.  
H317 : May cause an allergic skin reaction.  
H318 : Causes serious eye damage.  
H319 : Causes serious eye irritation.  
H330 : Fatal if inhaled.  
H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
  
H341 : Suspected of causing genetic defects.  
H350 : May cause cancer.  
H360FD : May damage fertility. May damage the unborn child.  
H372 : Causes damage to organs through prolonged or repeated exposure.  
  
H373 : May cause damage to organs through prolonged or repeated exposure if swallowed.  
  
H411 : Toxic to aquatic life with long lasting effects.  
EUH029 : Contact with water liberates toxic gas.  
EUH071 : Corrosive to the respiratory tract.

### Full text of other abbreviations

Acute Tox. : Acute toxicity  
Aquatic Chronic : Long-term (chronic) aquatic hazard  
Carc. : Carcinogenicity  
Eye Dam. : Serious eye damage  
Eye Irrit. : Eye irritation  
Muta. : Germ cell mutagenicity  
Repr. : Reproductive toxicity  
Resp. Sens. : Respiratory sensitisation  
Skin Corr. : Skin corrosion  
Skin Sens. : Skin sensitisation  
STOT RE : Specific target organ toxicity - repeated exposure  
2000/39/EC : Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values  
  
2004/37/EC : Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work  
  
2017/164/EU : Europe. Commission Directive 2017/164/EU establishing a fourth list of indicative occupational exposure limit values  
  
DE DFG BAT : Germany. MAK BAT Annex XIII  
DE DFG MAK : Germany. MAK BAT Annex IIa  
DE TRGS 900 : Germany. TRGS 900 - Occupational exposure limit values.  
TRGS 903 : TRGS 903 - Biological limit values  
2000/39/EC / TWA : Limit Value - eight hours  
2000/39/EC / STEL : Short term exposure limit  
2004/37/EC / TWA : Long term exposure limit  
2017/164/EU / TWA : Limit Value - eight hours  
DE DFG MAK / MAK : MAK value  
DE TRGS 900 / AGW : Time Weighted Average

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ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

### Further information

Sources of key data used to compile the Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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