

# SAFETY DATA SHEET

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



## BATTERY LI-ION 18 V / 2,0 AH M-CUBE BASIC

Version 9.1      Revision Date: 26.07.2024      SDS Number: 6104488-00012      Date of last issue: 25.06.2024  
Date of first issue: 01.07.2020

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

#### 1.1 Product identifier

Trade name : BATTERY LI-ION 18 V / 2,0 AH M-CUBE BASIC  
Product code : 5703420000

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

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

#### 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)

Effects on or via lactation      H362: May cause harm to breast-fed children.

#### 2.2 Label elements

##### Labelling (REGULATION (EC) No 1272/2008)

Hazard statements : H362      May cause harm to breast-fed children.

Precautionary statements : **Prevention:**  
P201      Obtain special instructions before use.

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P202      Do not handle until all safety precautions have been read and understood.  
P263      Avoid contact during pregnancy and while nursing.  
P264      Wash skin thoroughly after handling.  
P270      Do not eat, drink or smoke when using this product.

**Response:**

P308 + P313      IF exposed or concerned: Get medical advice/attention.

**Hazardous components which must be listed on the label:**

Lithium carbonate

**Additional Labelling**

EUH208      Contains Nickel, Cobalt lithium dioxide, Lithium nickel dioxide. May produce an allergic reaction.

Restricted to professional users.

### 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)
Lithium nickel dioxide	12031-65-1  028-057-00-7	Resp. Sens. 1; H334 Skin Sens. 1; H317 Muta. 2; H341 Carc. 1A; H350i Repr. 1B; H360D STOT RE 1; H372 (Lungs) Aquatic Acute 1; H400	>= 20 - < 25

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		Aquatic Chronic 1; H410 <hr/> M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 10 <hr/> specific concentration limit STOT RE 1; H372 >= 1 % STOT RE 2; H373 0,1 - < 1 %	
Lithium Manganese (III,IV) oxide	12057-17-9	STOT RE 2; H373 (Central nervous system, Respiratory Tract, Cardiovascular system) Aquatic Chronic 2; H411	>= 10 - < 20
Ethylene carbonate	96-49-1 202-510-0	Acute Tox. 4; H302 Eye Irrit. 2; H319 STOT RE 2; H373 (Kidney) <hr/> Acute toxicity estimate  Acute oral toxicity: 1.900 mg/kg	>= 1 - < 10
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 <hr/> Acute toxicity estimate  Acute oral toxicity: 50,01 mg/kg	>= 5 - < 10
Cobalt lithium dioxide	12190-79-3 235-362-0	Resp. Sens. 1B; H334 Muta. 2; H341 Carc. 1B; H350 Repr. 1B; H360F STOT RE 1; H372 (Thyroid, Heart,	>= 2,5 - < 10

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		Blood, Respiratory Tract) Aquatic Chronic 2; H411	
		specific concentration limit Carc. 1B; H350 >= 0,01 %	
Nickel	7440-02-0 231-111-4 028-002-00-7	Skin Sens. 1; H317 Carc. 2; H351 STOT RE 1; H372 (Respiratory Tract)	>= 0,1 - < 1
Lithium carbonate	554-13-2 209-062-5	Acute Tox. 4; H302 Eye Irrit. 2; H319 Repr. 1A; H360FD Lact.; H362	>= 0,3 - < 1
		Acute toxicity estimate  Acute oral toxicity: 525 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.

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May cause harm to breast-fed children.

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

Treatment : Treat symptomatically and supportively.

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## 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 : Carbon oxides  
Metal oxides  
Cobalt compounds  
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.

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## 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.

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

Methods for cleaning up : Not applicable

### 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

Avoid contact during pregnancy and while nursing.  
Wash skin thoroughly after handling.  
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
Graphite	7782-42-5	AGW (Inhalable fraction)	10 mg/m <sup>3</sup>	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/m <sup>3</sup>	DE TRGS 900
		Peak-limit: excursion factor (category): 2;(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			
		MAK (measured as the alveolate fraction)	0,3 mg/m <sup>3</sup>	DE DFG MAK
	Peak-limit: excursion factor (category): 8; II			
	Further information: Substances that cause cancer in humans or animals or that are considered to be carcinogenic for humans and for which a MAK value can be derived., Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			
		MAK (inhalable fraction)	4 mg/m <sup>3</sup>	DE DFG MAK
	Peak-limit: excursion factor (category): 8; II			
	Further information: Substances that cause cancer in humans or animals or that are considered to be carcinogenic for humans and for which a MAK value can be derived., Damage to the embryo or foetus is unlikely when the MAK value or the BAT value is observed			
Lithium nickel dioxide	12031-65-1	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			
		AGW (Inhalable fraction)	0,03 mg/m <sup>3</sup>	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			
	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			
		Acceptable concentration (Alveolate part)	6 microgram per cubic meter (Nickel)	DE TRGS 910
		Tolerable concentration (Alveolate part)	6 microgram per cubic meter (Nickel)	DE TRGS 910
	Peak-limit: excursion factor (category): 8 - Excursion factor according to Number 3.2.6			
		TWA (Respirable dust)	0,01 mg/m <sup>3</sup>	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		TWA (inhalable fraction)	0,1 mg/m <sup>3</sup>	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		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			
Lithium Manganese (III,IV) oxide	12057-17-9	AGW (Inhalable fraction)	0,2 mg/m <sup>3</sup> (Manganese)	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			

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		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/m3 (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)	0,2 mg/m3 (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 (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		
		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)		
		MAK (inhalable fraction)	0,2 mg/m3 (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		
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 hexafluor- ophosphate	21324-40-3	AGW (Inhalable fraction)	1 mg/m3 (Fluorine)	DE TRGS 900
		Peak-limit: excursion factor (category): 4;(II)		



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	Further information: Skin absorption, 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			
Cobalt lithium dioxide	12190-79-3	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			
		Acceptable concentration (Alveolate part)	0,5 microgram per cubic meter (Cobalt)	DE TRGS 910
		Tolerable concentration (Alveolate part)	5 microgram per cubic meter (Cobalt)	DE TRGS 910
	Peak-limit: excursion factor (category): 8 - Excursion factor according to Number 3.2.6			
Copper	7440-50-8	MAK (measured as the alveolate fraction)	0,01 mg/m <sup>3</sup>	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			
Nickel	7440-02-0	AGW (Alveolate fraction)	0,006 mg/m <sup>3</sup> (Nickel)	DE TRGS 900
	Peak-limit: excursion factor (category): 8;(II)			
	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 (Respirable dust)	0,01 mg/m <sup>3</sup>	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		TWA (inhalable fraction)	0,1 mg/m <sup>3</sup>	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
Lithium carbonate	554-13-2	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			
		MAK (inhalable fraction)	0,2 mg/m <sup>3</sup> (Lithium)	DE DFG MAK

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	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

### 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 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

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	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
Iron	Workers	Inhalation	Long-term local effects	3 mg/m <sup>3</sup>
	Consumers	Inhalation	Long-term local effects	1,5 mg/m <sup>3</sup>
	Consumers	Ingestion	Long-term systemic effects	0,71 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
	Workers	Inhalation	Acute systemic effects	20 mg/m <sup>3</sup>
	Workers	Skin contact	Acute systemic effects	273 mg/kg

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			fects	bw/day
	Consumers	Skin contact	Long-term systemic effects	137 mg/kg bw/day
Graphite	Consumers	Inhalation	Long-term local effects	0,3 mg/m3
	Consumers	Ingestion	Long-term systemic effects	813 mg/kg bw/day
	Workers	Inhalation	Long-term local effects	1,2 mg/m3
Ethylene carbonate	Workers	Inhalation	Long-term systemic effects	15 mg/m3
	Workers	Skin contact	Long-term systemic effects	4,3 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	3,7 mg/m3
	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/m3
	Workers	Skin contact	Long-term systemic effects	0,133 mg/kg bw/day
Cobalt lithium dioxide	Workers	Inhalation	Long-term local effects	0,0664 mg/m3
	Consumers	Inhalation	Long-term local effects	0,0105 mg/m3
	Consumers	Ingestion	Long-term systemic effects	0,0495 mg/kg bw/day
Dimethyl carbonate	Workers	Inhalation	Long-term systemic effects	17,2 mg/m3
	Workers	Inhalation	Acute systemic effects	57 mg/m3
	Workers	Skin contact	Long-term systemic effects	5 mg/kg bw/day
	Workers	Inhalation	Acute local effects	57 mg/m3
	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/m3
	Consumers	Inhalation	Acute systemic effects	42,5 mg/m3
	Consumers	Inhalation	Acute local effects	42,5 mg/m3
	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	2,5 mg/kg

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			effects	bw/day
	Consumers	Ingestion	Acute systemic effects	50 mg/kg bw/day
Nickel	Workers	Inhalation	Long-term systemic effects	0,05 mg/m <sup>3</sup>
	Workers	Inhalation	Acute systemic effects	680 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	0,05 mg/m <sup>3</sup>
	Workers	Inhalation	Acute local effects	4 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term local effects	0,035 mg/cm <sup>2</sup>
	Consumers	Inhalation	Long-term systemic effects	0,00002 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute systemic effects	408 mg/m <sup>3</sup>
	Consumers	Inhalation	Long-term local effects	0,00002 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute local effects	2,4 mg/m <sup>3</sup>
	Consumers	Skin contact	Long-term local effects	0,035 mg/cm <sup>2</sup>
	Consumers	Ingestion	Long-term systemic effects	0,02 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	0,012 mg/kg bw/day
Lithium carbonate	Workers	Inhalation	Long-term systemic effects	10 mg/m <sup>3</sup>
	Workers	Inhalation	Acute systemic effects	30 mg/m <sup>3</sup>
	Workers	Skin contact	Long-term systemic effects	64,3 mg/kg bw/day
	Workers	Skin contact	Acute systemic effects	100 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	9,64 mg/m <sup>3</sup>
	Consumers	Inhalation	Acute systemic effects	28,92 mg/m <sup>3</sup>
	Consumers	Skin contact	Long-term systemic effects	64,3 mg/kg bw/day
	Consumers	Skin contact	Acute systemic effects	50 mg/kg bw/day
	Consumers	Ingestion	Long-term systemic effects	6,43 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	19,23 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

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	Fresh water sediment	87 mg/kg
	Marine sediment	676 mg/kg
	Soil	65 mg/kg
Ethylene carbonate	Fresh water	5,9 mg/l
	Intermittent use/release	59 mg/l
	Marine water	0,59 mg/l
	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.)
Cobalt lithium dioxide	Fresh water	0,0006 mg/l
	Marine water	0,00236 mg/l
	Sewage treatment plant	0,37 mg/l
	Fresh water sediment	9,5 mg/kg dry weight (d.w.)
	Marine sediment	9,5 mg/kg dry weight (d.w.)
	Soil	10,9 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
Lithium carbonate	Fresh water	9 mg/l
	Marine water	0,9 mg/l
	Intermittent use/release	0,3 mg/l
	Sewage treatment plant	122,2 mg/l
	Fresh water sediment	35,2 mg/kg
	Marine sediment	3,52 mg/kg
	Soil	1,76 mg/kg

### 8.2 Exposure controls

#### Engineering measures

Not applicable

#### Personal protective equipment

Eye/face protection : Not applicable

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Hand protection

Remarks : not required

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)

---

### SECTION 9: Physical and chemical properties

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

Physical state : solid

Colour : No data available

Odour : odourless

Odour Threshold : No data available

Melting point/freezing point : No data available

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

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Decomposition temperature : No data available

pH : substance/mixture is non-soluble (in water)

Viscosity  
Viscosity, kinematic : Not applicable

Solubility(ies)  
Water solubility : insoluble

Partition coefficient: n-  
octanol/water : Not applicable

Vapour pressure : Not applicable

Relative density : No data available

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

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Not classified as a reactivity hazard.



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### 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

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

Acute inhalation toxicity : Assessment: The substance or mixture has no acute inhalation toxicity, Not corrosive to the respiratory tract  
Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

#### Components:

##### Lithium nickel dioxide:

Acute oral toxicity : LD50 (Rat): > 100 mg/kg  
Remarks: Based on data from similar materials

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

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Remarks: Based on data from similar materials

### Lithium Manganese (III,IV) oxide:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg  
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg  
Remarks: Based on data from similar materials

### 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

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.

### Cobalt lithium dioxide:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg  
Method: OECD Test Guideline 425

Acute dermal toxicity : LD50 (Rat): > 2.000 mg/kg  
Method: OECD Test Guideline 402  
Remarks: Based on data from similar materials

### Nickel:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg  
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC0 (Rat): 10,2 mg/l  
Exposure time: 1 h  
Test atmosphere: dust/mist

### Lithium carbonate:

Acute oral toxicity : LD50 (Rat): 525 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
Exposure time: 4 h

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Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit): > 3.000 mg/kg

### 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:

##### 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

##### Cobalt lithium dioxide:

Species : reconstructed human epidermis (RhE)  
Method : OECD Test Guideline 439  
Result : No skin irritation

##### Nickel:

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

##### Lithium carbonate:

Species : Rabbit  
Result : No skin irritation

### 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

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### Components:

#### **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.

#### **Cobalt lithium dioxide:**

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

#### **Nickel:**

Species : Rabbit  
Method : OECD Test Guideline 405  
Result : No eye irritation  
Remarks : Based on data from similar materials

#### **Lithium carbonate:**

Species : Rabbit  
Result : Irritation to eyes, reversing within 7 days

### **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 respiratory sensitisation.  
Remarks : Based on bioavailability assessment according to 1.3.2.4.5  
UN GHS/CLP article 12

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

### Components:

#### **Lithium nickel dioxide:**

Exposure routes : Skin contact  
Species : Humans  
Result : positive

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Assessment : Probability or evidence of skin sensitisation in humans

Assessment : May cause sensitisation by inhalation.

### Lithium Manganese (III,IV) oxide:

Exposure routes : Skin contact  
Result : negative  
Remarks : Based on data from similar materials

### Ethylene carbonate:

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

### Cobalt lithium dioxide:

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

Exposure routes : inhalation (dust/mist/fume)  
Species : Humans  
Result : positive  
Remarks : Based on data from similar materials

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

### Nickel:

Assessment : Probability or evidence of skin sensitisation in humans  
Remarks : Based on national or regional regulation.

### Lithium carbonate:

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

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Result : negative

### Germ cell mutagenicity

Not classified based on available information.

### Components:

#### Lithium nickel dioxide:

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

Test Type: Sex-linked recessive lethal test in *Drosophila melanogaster* (in vivo)  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

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

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

#### Lithium Manganese (III,IV) oxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative  
Remarks: Based on data from similar materials

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

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Result: negative  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: Based on data from similar materials

### 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.

### Cobalt lithium dioxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: positive  
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test

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Method: OECD Test Guideline 476  
Result: positive  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: positive  
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Micronucleus test  
Species: Mouse  
Application Route: Intraperitoneal injection  
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)  
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.

### **Lithium carbonate:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: Based on data from similar materials

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

### **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:

#### **Lithium nickel dioxide:**

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 (inhalation)

#### **Cobalt lithium dioxide:**

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

Carcinogenicity - Assessment : Sufficient evidence of carcinogenicity in animal experiments

#### **Nickel:**

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in inhalation studies with animals.

#### **Reproductive toxicity**

May cause harm to breast-fed children.

### 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:

#### **Lithium nickel dioxide:**

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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: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Result: positive  
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : 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

### Cobalt lithium dioxide:

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

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

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

### **Lithium carbonate:**

Effects on fertility : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Result: positive

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

Studies indicating a hazard to babies during the lactation period

### **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

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### Components:

#### **Lithium nickel dioxide:**

Exposure routes : Inhalation  
Target Organs : Lungs  
Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

#### **Lithium Manganese (III,IV) oxide:**

Assessment : May cause damage to organs through prolonged or repeated exposure.

#### **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.

#### **Cobalt lithium dioxide:**

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

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

#### **Nickel:**

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

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### Repeated dose toxicity

#### Components:

##### **Lithium nickel dioxide:**

Species : Rat  
LOAEL : < 0,1 µg/l  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 2 yr  
Remarks : Based on data from similar materials

##### **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

##### **Cobalt lithium dioxide:**

Species : Rat  
LOAEL : 1,26 mg/kg  
Application Route : Ingestion  
Exposure time : 90 Days  
Method : OECD Test Guideline 408  
Remarks : Based on data from similar materials

Species : Mouse  
LOAEL : < 0,01 mg/l  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 13 Weeks  
Method : OECD Test Guideline 413  
Remarks : Based on data from similar materials

Species : Rat  
LOAEL : < 0,01 mg/l  
Application Route : inhalation (dust/mist/fume)  
Exposure time : 13 Weeks  
Method : OECD Test Guideline 413  
Remarks : Based on data from similar materials

##### **Nickel:**

Species : Rat  
NOAEL : 4 mg/m<sup>3</sup>

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Application Route : inhalation (dust/mist/fume)  
Exposure time : 4 Weeks  
Method : OECD Test Guideline 412

### 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:

##### **Lithium nickel dioxide:**

Inhalation : Target Organs: Respiratory system  
Symptoms: Tumour

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

Ingestion : Target Organs: Kidney

##### **Cobalt lithium dioxide:**

Inhalation : Target Organs: Respiratory system

Ingestion : Target Organs: Blood

Target Organs: Heart

Target Organs: Thyroid

##### **Lithium carbonate:**

General Information : Target Organs: Heart  
Symptoms: Visceral malformations

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### SECTION 12: Ecological information

#### 12.1 Toxicity

##### Product:

##### **Ecotoxicology Assessment**

Acute aquatic toxicity : This product has no known ecotoxicological effects.  
Chronic aquatic toxicity : This product has no known ecotoxicological effects.

##### Components:

##### **Lithium nickel dioxide:**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 0,1 - 1 mg/l  
Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): > 0,1 - 1 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0,1 - 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

EC10 : > 0,01 - 0,1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

M-Factor (Acute aquatic toxicity) : 1

Toxicity to fish (Chronic toxicity) : NOEC: > 0,01 - 0,1 mg/l  
Exposure time: 8 d  
Species: Danio rerio (zebra fish)  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10: > 0,001 - 0,01 mg/l  
Exposure time: 7 d  
Species: Ceriodaphnia dubia (water flea)  
Remarks: Based on data from similar materials

M-Factor (Chronic aquatic toxicity) : 10

##### **Lithium Manganese (III,IV) oxide:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 1 - 10 mg/l

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Exposure time: 96 h  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia dubia (water flea)): > 1 - 10 mg/l  
Exposure time: 48 h  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

Toxicity to fish (Chronic toxicity) : NOEC: > 0,1 - 1 mg/l  
Exposure time: 65 d  
Species: Salvelinus fontinalis (Brook trout)  
Remarks: Based on data from similar materials

### 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

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



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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

### Cobalt lithium dioxide:

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): > 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)): > 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)): > 1 - 10 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) : EL10: > 1 mg/l  
Exposure time: 34 d  
Species: Danio rerio (zebra fish)  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EL10: > 1 mg/l  
Exposure time: 28 d  
Method: OECD Test Guideline 211  
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

### Nickel:

#### Ecotoxicology Assessment

Acute aquatic toxicity : No toxicity at the limit of solubility

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Chronic aquatic toxicity : No toxicity at the limit of solubility

### **Lithium carbonate:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 30,3 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 33,2 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 400 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 50 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC10 : 122,2 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
Remarks: Based on data from similar materials

Toxicity to fish (Chronic toxicity) : NOEC: 15,27 mg/l  
Exposure time: 34 d  
Species: Danio rerio (zebra fish)  
Method: OECD Test Guideline 210  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 9 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Method: OECD Test Guideline 211  
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-octanol/water : log Pow: 0,11

##### **Nickel:**

Bioaccumulation : Bioconcentration factor (BCF): < 500  
Remarks: Expert judgement

### 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:

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used product  
16 06 05, other batteries and accumulators

unused product  
16 06 05, other batteries and accumulators

uncleaned packagings  
15 01 06, mixed packaging

Acc. Packaging Act properly emptied packaging:

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### SECTION 14: Transport information

#### 14.1 UN number or ID number

ADN	:	UN 3480
ADR	:	UN 3480
RID	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
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	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
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	:	Not regulated as a dangerous good
IMDG	:	Not regulated as a dangerous good
IATA (Cargo)	:	9 LITH_BAT_M
IATA (Passenger)	:	Not permitted for transport

#### 14.4 Packing group

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### ADN

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

### 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

Remarks : Not regulated as a dangerous good  
: Transport in accordance with special regulation 188

### IMDG

Remarks : Not regulated as a dangerous good  
: 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

: Not regulated as a dangerous good

### IMDG

: Not regulated as a dangerous good

## 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

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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 75

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.

If you intend to use this product as tattoo ink, please contact your vendor.

Nickel (Number on list 75, 27)  
Copper (Number on list 75)  
Lithium nickel dioxide (Number on list 28, 27)

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

Regulation (EC) No 1005/2009 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: 1 % Nickel  
Class 3: 35 % Copper, Lithium hexafluorophosphate, Lithium Manganese (III,IV) oxide  
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 1: 35 % Cobalt lithium dioxide, Lithium nickel dioxide

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:

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

Contains a substance which is subject to the TRGS 905 : Cobalt lithium dioxide  
list of carcinogenic, germ cell mutagenic and reproductive toxic substances.  
carcinogenic: category 1B 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

Contains a substance which is subject to the TRGS 907 : Lithium nickel dioxide  
list of sensitizing substances.

### 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.
H334	: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	: Suspected of causing genetic defects.
H350	: May cause cancer.
H350i	: May cause cancer by inhalation.
H351	: Suspected of causing cancer if inhaled.
H360D	: May damage the unborn child.
H360F	: May damage fertility.
H360FD	: May damage fertility. May damage the unborn child.
H362	: May cause harm to breast-fed children.
H372	: Causes damage to organs through prolonged or repeated exposure if inhaled.
H372	: Causes damage to organs through prolonged or repeated exposure.
H373	: May cause damage to organs through prolonged or repeated exposure if swallowed.
H373	: May cause damage to organs through prolonged or repeated exposure.
H400	: Very toxic to aquatic life.
H410	: Very toxic to aquatic life with long lasting effects.
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 Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Carc.	: Carcinogenicity
Eye Dam.	: Serious eye damage
Eye Irrit.	: Eye irritation
Lact.	: Effects on or via lactation
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



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DE DFG MAK	:	Germany. MAK BAT Annex IIa
DE TRGS 900	:	Germany. TRGS 900 - Occupational exposure limit values.
DE TRGS 910	:	Germany. TRGS 910 - Substance-specific acceptable and tolerable concentrations and equivalence values for carcinogenic hazardous substances.
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
DE TRGS 910 / Acceptable concentration	:	Acceptable concentration
DE TRGS 910 / Tolerable concentration	:	Tolerable concentration

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - 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 : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agen-

# SAFETY DATA SHEET

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



## BATTERY LI-ION 18 V / 2,0 AH M-CUBE BASIC

Version	Revision Date:	SDS Number:	Date of last issue: 25.06.2024
9.1	26.07.2024	6104488-00012	Date of first issue: 01.07.2020

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Sheet cy, <http://echa.europa.eu/>

**Classification of the mixture:**

Lact. H362

**Classification procedure:**

Calculation method

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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