

SAFETY DATA SHEET

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



BATTERY LI-ION 18 V / 5,0 AH M-CUBE BASIC

Version	Revision Date:	SDS Number:	Date of last issue: 30.10.2024
14.0	10.03.2025	4832428-00017	Date of first issue: 06.09.2019

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

1.1 Product identifier

Trade name : BATTERY LI-ION 18 V / 5,0 AH M-CUBE BASIC
Product code : 5703450000

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

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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- EUH208 Contains Nickel, Cobalt lithium dioxide, 4-Fluoro-1,3-dioxolan-2-one, Lithium nickel oxide. May produce an allergic reaction.
- EUH210 Safety data sheet available on request.

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 oxide	12325-84-7	Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Muta. 2; H341 Carc. 1A; H350i Repr. 2; H361d STOT RE 1; H372 (Lungs) Aquatic Acute 1; H400 Aquatic Chronic 1; H410 EUH071 M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 10	>= 30 - < 50
Cobalt lithium dioxide	12190-79-3 235-362-0	Resp. Sens. 1B; H334 Muta. 2; H341 Carc. 1B; H350	>= 2,5 - < 10

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		Repr. 1B; H360F STOT RE 1; H372 (Thyroid, Heart, Blood, Respiratory Tract) Aquatic Chronic 2; H411	
		specific concentration limit Carc. 1B; H350 >= 0,01 %	
methyl propionate	554-12-1 209-060-4 607-027-00-2	Flam. Liq. 2; H225 Acute Tox. 4; H332 Eye Dam. 1; H318	>= 3 - < 10
		Acute toxicity esti- mate	
		Acute inhalation tox- icity (vapour): 11 mg/l	
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 esti- mate	
		Acute oral toxicity: 100 mg/kg	
4-Fluoro-1,3-dioxolan-2-one	114435-02-8 483-360-5	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317 STOT RE 1; H372 (Teeth)	>= 1 - < 10
		Acute toxicity esti- mate	
		Acute oral toxicity: 500 mg/kg	
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

For explanation of abbreviations see section 16.

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SECTION 4: First aid measures

4.1 Description of first aid measures

- Protection of first-aiders : No special precautions are necessary for first aid responders.
- 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

- Treatment : Treat symptomatically and supportively.
-

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
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 : Metal oxides
Nickel compounds
Carbon oxides
Cobalt compounds
Fluorine compounds
Oxides of phosphorus

5.3 Advice for firefighters

- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.
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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

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

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

Recommended storage temperature : < 125 °C

7.3 Specific end use(s)

Specific use(s) : No data available

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Lithium nickel oxide	12325-84-7	AGW (Inhalable fraction)	0,03 mg/m ³	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 ³	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		TWA (inhalable fraction)	0,1 mg/m ³	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
Graphite	7782-42-5	AGW (Inhalable fraction)	10 mg/m ³	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 ³	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			
		MAK (measured as the alveolate fraction)	0,3 mg/m ³	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 ³	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			
Copper	7440-50-8	MAK (measured as the alveolate fraction)	0,01 mg/m ³	DE DFG MAK

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	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/m ³	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 ³	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			
Cobalt lithium dioxide	12190-79-3	AGW (Inhalable fraction)	0,2 mg/m ³ (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			
Lithium hexafluorophosphate	21324-40-3	AGW (Inhalable fraction)	1 mg/m ³ (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			
		TWA	2,5 mg/m ³ (Fluorine)	2000/39/EC
	Further information: Indicative			
		MAK (inhalable fraction)	1 mg/m ³ (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			
Nickel	7440-02-0	AGW (Alveolate fraction)	0,006 mg/m ³ (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 ³	2004/37/EC
	Further information: dermal and respiratory sensitisation, Carcinogens or mutagens			
		TWA (inhalable)	0,1 mg/m ³	2004/37/EC

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		fraction)		
	Further information: dermal and respiratory sensitisation, Carcinogens or mu- tagens			

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 ³	2000/39/EC
	Further information: Indicative			
		STEL	2 mg/m ³	2000/39/EC
	Further information: Indicative			
		AGW (Inhalable fraction)	2 mg/m ³	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 ³	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 ³	2000/39/EC
	Further information: Indicative			
		STEL	3 ppm 2,5 mg/m ³	2000/39/EC
	Further information: Indicative			
		AGW	1 ppm 0,83 mg/m ³	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 ³	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 ³ (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 ³ (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 ³ (Fluorine)	2000/39/EC

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	Further information: Indicative		
	MAK (inhalable fraction)	1 mg/m ³ (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 ³ (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 ³
	Consumers	Ingestion	Long-term systemic effects	3,95 mg/kg bw/day
Iron	Workers	Inhalation	Long-term local effects	3 mg/m ³
	Consumers	Inhalation	Long-term local effects	1,5 mg/m ³
	Consumers	Ingestion	Long-term systemic effects	0,71 mg/kg bw/day
Copper	Consumers	Inhalation	Acute systemic effects	20 mg/m ³
	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 ³
	Workers	Skin contact	Acute systemic effects	273 mg/kg

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	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
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 effects	2,5 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	50 mg/kg bw/day
4-Fluoro-1,3-dioxolan-2-one	Workers	Inhalation	Long-term systemic effects	0,164 mg/m3
Nickel	Workers	Inhalation	Long-term systemic effects	0,05 mg/m3
	Workers	Inhalation	Acute systemic effects	680 mg/m3
	Workers	Inhalation	Long-term local effects	0,05 mg/m3

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			fects	
	Workers	Inhalation	Acute local effects	4 mg/m ³
	Workers	Skin contact	Long-term local effects	0,035 mg/cm ²
	Consumers	Inhalation	Long-term systemic effects	0,00002 mg/m ³
	Consumers	Inhalation	Acute systemic effects	408 mg/m ³
	Consumers	Inhalation	Long-term local effects	0,00002 mg/m ³
	Consumers	Inhalation	Acute local effects	2,4 mg/m ³
	Consumers	Skin contact	Long-term local effects	0,035 mg/cm ²
	Consumers	Ingestion	Long-term systemic effects	0,02 mg/kg bw/day
	Consumers	Ingestion	Acute systemic effects	0,012 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
Lithium hexafluorophosphate	Marine sediment	676 mg/kg
	Soil	65 mg/kg
	Fresh water	0,31 mg/l
	Marine water	0,031 mg/l
Cobalt lithium dioxide	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.)
	Fresh water	0,0006 mg/l
	Marine water	0,00236 mg/l
Dimethyl carbonate	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.)
	Fresh water	0,5 mg/l
4-Fluoro-1,3-dioxolan-2-one	Marine water	0,05 mg/l
	Intermittent use/release	1 mg/l
	Sewage treatment plant	188 mg/l
	Freshwater - intermittent	0,084 mg/l

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	Marine water	0,001 mg/l
	Marine water - intermittent	0,008 mg/l
	Sewage treatment plant	8 mg/l
	Fresh water sediment	0,035 mg/kg dry weight (d.w.)
	Marine sediment	0,004 mg/kg dry weight (d.w.)
	Soil	0,002 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Not applicable

Personal protective equipment

Eye/face protection : Not applicable

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

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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)

Viscosity
Viscosity, kinematic : Not applicable

Solubility(ies)
Water solubility : insoluble

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

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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

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

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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 oxide:

Acute oral toxicity : LD50 (Rat): > 300 mg/kg
Remarks: Based on data from similar materials

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

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

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

methyl propionate:

Acute oral toxicity : LD50 (Rabbit): 2.002 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 11 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Expert judgement
Remarks: Based on national or regional regulation.

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg

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.

4-Fluoro-1,3-dioxolan-2-one:

Acute oral toxicity : LD50 (Rat, female): 500 mg/kg
Method: OECD Test Guideline 423

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

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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

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:

Lithium nickel oxide:

Species : Rabbit
Method : OECD Test Guideline 404
Result : Corrosive after 3 minutes to 1 hour of exposure
Remarks : Based on data from similar materials

Cobalt lithium dioxide:

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

methyl propionate:

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 439
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

4-Fluoro-1,3-dioxolan-2-one:

Species : reconstructed human epidermis (RhE)
Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 439
Result : Skin irritation

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Nickel:

Species : Rabbit
Method : OECD Test Guideline 404
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

Components:

Lithium nickel oxide:

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

methyl propionate:

Species : Chicken eye
Method : OECD Test Guideline 438
Result : Irreversible effects on the eye

Lithium hexafluorophosphate:

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

4-Fluoro-1,3-dioxolan-2-one:

Species : Rabbit
Method : OECD Test Guideline 405
Result : Irritation to eyes, reversing within 21 days
Remarks : Based on data from similar materials

Nickel:

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

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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 oxide:

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

Assessment : Probability or evidence of skin sensitisation in humans

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

methyl propionate:

Test Type : Direct Peptide Reactivity Assay (DPRA)
Method : OECD Test Guideline 442C

Test Type : KeratinoSens assay
Method : OECD Test Guideline 442D

Result : negative

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Lithium hexafluorophosphate:

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

4-Fluoro-1,3-dioxolan-2-one:

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

Assessment : Probability or evidence of skin sensitisation in humans

Nickel:

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

Germ cell mutagenicity

Not classified based on available information.

Components:

Lithium nickel oxide:

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

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

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

Cobalt lithium dioxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)

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Method: OECD Test Guideline 471
Result: positive
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
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.

methyl propionate:

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
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

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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.

4-Fluoro-1,3-dioxolan-2-one:

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

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

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Not classified based on available information.

Product:

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

Components:

Lithium nickel oxide:

Species : Humans
Application Route : inhalation (dust/mist/fume)
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)

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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

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:

Lithium nickel oxide:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : Some evidence of adverse effects on development, based on animal experiments.

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

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Test Type: Fertility/early embryonic development
Species: Mouse
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 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

4-Fluoro-1,3-dioxolan-2-one:

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 421
Result: negative

Effects on foetal development : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat

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Application Route: Ingestion
Method: OECD Test Guideline 421
Result: negative

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:

Lithium nickel oxide:

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

Exposure routes : inhalation (dust/mist/fume)
Target Organs : Lungs
Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/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.

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.

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4-Fluoro-1,3-dioxolan-2-one:

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

Repeated dose toxicity

Components:

Lithium nickel oxide:

Species : Rat
LOAEL : > 0,0 - 0,02 mg/l
Application Route : inhalation (dust/mist/fume)
Exposure time : 2 yr
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

Lithium hexafluorophosphate:

Species : Rat
LOAEL : < 50 ppm
Application Route : inhalation (gas)
Exposure time : 1 Months

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Remarks : Based on data from similar materials

4-Fluoro-1,3-dioxolan-2-one:

Species : Rat
NOAEL : 5 mg/kg
Application Route : Ingestion
Exposure time : 35 - 48 Days
Method : OECD Test Guideline 421

Nickel:

Species : Rat
NOAEL : 4 mg/m³
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:

Cobalt lithium dioxide:

Inhalation : Target Organs: Respiratory system

Ingestion : Target Organs: Blood

Target Organs: Heart

Target Organs: Thyroid

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SECTION 12: Ecological information

12.1 Toxicity

Product:

Ecotoxicology Assessment

Components:

Lithium nickel oxide:

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 : LC50 (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 : EC50 (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

M-Factor (Acute aquatic toxicity) : 1

Toxicity to microorganisms : EC50 : > 10 - 100 mg/l
Exposure time: 3 h
Method: ISO 8192
Remarks: Based on data from similar materials

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

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

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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

methyl propionate:

Toxicity to algae/aquatic plants : EC10 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h
ErC50 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 3,2 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)

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

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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

4-Fluoro-1,3-dioxolan-2-one:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 6 - 60 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 8,4 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 32 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 2,2 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC : 80 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Nickel:

Ecotoxicology Assessment

Acute aquatic toxicity : No toxicity at the limit of solubility

Chronic aquatic toxicity : No toxicity at the limit of solubility

12.2 Persistence and degradability

Components:

methyl propionate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 77 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Lithium hexafluorophosphate:

Biodegradability : Result: rapidly degradable

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4-Fluoro-1,3-dioxolan-2-one:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 65 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

12.3 Bioaccumulative potential

Components:

methyl propionate:

Partition coefficient: n-
octanol/water : log Pow: 0,8
Method: OECD Test Guideline 117

4-Fluoro-1,3-dioxolan-2-one:

Partition coefficient: n-
octanol/water : log Pow: -0,435
Method: OECD Test Guideline 107

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:
- used product
16 06 05, other batteries and accumulators
 - unused product
16 06 05, other batteries and accumulators
 - 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 : 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

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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

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

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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.

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) :

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.

Conditions of restriction for the following entries should be considered:
Number on list 27: Nickel, Lithium nickel oxide

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

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

Regulation (EU) No 2024/590 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 : Not applicable

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(Annex XIV)

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: 19 % Chromium, Copper, Lithium hexafluorophosphate
5.2.4: Inorganic substances in gaseous form:
Not applicable
5.2.5: Organic Substances:
Not applicable
5.2.7.1.1: Carcinogenic substance:
Class 1: 40 % Cobalt lithium dioxide, Lithium nickel oxide
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 list of carcinogenic, germ cell mutagenic and reproductive toxic substances. : Cobalt lithium dioxide
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

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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.

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.

Full text of H-Statements

H225 : Highly flammable liquid and vapour.
H301 : Toxic if swallowed.
H302 : Harmful if swallowed.
H314 : Causes severe skin burns and eye damage.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H319 : Causes serious eye irritation.
H332 : Harmful if inhaled.
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.
H360F : May damage fertility.
H361d : Suspected of damaging the unborn child.
H372 : Causes damage to organs through prolonged or repeated exposure.

H372 : Causes damage to organs through prolonged or repeated exposure if inhaled.

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
Flam. Liq. : Flammable liquids
Muta. : Germ cell mutagenicity
Repr. : Reproductive toxicity

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Resp. Sens.	:	Respiratory sensitisation
Skin Corr.	:	Skin corrosion
Skin Irrit.	:	Skin irritation
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
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.
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
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 Re-

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striction 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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