

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

1.1 Product identifier

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

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

Application of the substance / the mixture Rechargeable Li-ion battery

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Tridonic GmbH & Co KG

Färbergasse 15

6850 Dornbirn

Austria

Tel: +43 5572 395-0

sales@tridonic.com

Further information obtainable from:

Gerhard Radl

gerhard.radl@tridonic.com

1.4 Emergency telephone number:

+43 5572 395-0

Available during office hours:

Mo - Fr 8.00 - 16.00 h

Call the national emergency number!

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

The product is not classified, according to the CLP regulation.

Additional information:

The product itself is declared as an article and is not subject to the provisions of classification in sense of the regulation (EC) No. 1272/2008.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 Void

Hazard pictograms Void

Signal word Void

Hazard statements Void

Additional information:

The product itself is declared as an article and is not subject to the provisions of labeling in sense of the regulation (EC) No. 1272/2008.

2.3 Other hazards

Lithium-ion batteries are gas-tight and harmless if the manufacturer's instructions are observed during use and handling.

Never use chargers that are not suitable for the type of battery with rechargeable batteries. The limits for maximum current load, charging and discharging voltage must be strictly adhered to! Do not short-circuit. Do not damage mechanically (pierce, deform, disassemble, etc.). Do not heat or burn above the permissible temperature. Keep batteries away from small children. Always store batteries in a dry and cool place.

(Contd. on page 2)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 1)

Lithium-ion batteries are safe to use when used properly and within the parameters specified by the manufacturer. Incorrect handling or circumstances resulting in improper operation may result in leakage of battery contents and decomposition products, resulting in severe reactions hazardous to health and the environment. In principle, contact with leaked battery components can pose a risk to health and the environment. Sufficient body and respiratory protection is therefore required in contact with conspicuous batteries (leakage of contents, deformation, discoloration, dents, etc.). Lithium-ion batteries can react very violently in combination with fire, for example. Battery components with considerable energy can be emitted.

As with other batteries, lithium batteries can continue to be a source of danger even when they are supposedly discharged.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.










SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description:

Rechargeable lithium-ion batteries are articles from which no substance is released when used properly.


Dangerous components:

CAS: 12190-79-3 EINECS: 235-362-0	Lithium-Cobalt(III)-oxid  Repr. 1B, H360	0 – 45%
CAS: 193214-24-3 EC number: 803-110-4	Lithium Cobalt Nickel Aluminum Oxide  Carc. 2, H351  Skin Sens. 1, H317	0 – 45%
CAS: 346417-97-8 EC number: 620-032-4	Lithium Nickel Manganese Cobalt Oxide  Carc. 2, H351  Skin Sens. 1, H317	0 – 45%
CAS: 7440-44-0 EINECS: 231-153-3	carbon substance with a Community workplace exposure limit	10 – 30%
CAS: 12057-17-9 EC number: 601-724-5	Lithium Manganese (III,IV) oxide  Acute Tox. 4, H302; Acute Tox. 4, H332 Aquatic Chronic 4, H413	0 – 20%
CAS: 616-38-6 EINECS: 210-478-4 Index number: 607-013-00-6	dimethyl carbonate  Flam. Liq. 2, H225	1 – 15%
CAS: 7440-50-8 EINECS: 231-159-6	copper substance with a Community workplace exposure limit	7 – 13%
CAS: 623-53-0 ELINCS: 433-480-9	Ethylmethylcarbonat  Flam. Liq. 2, H225	1 – 10%
CAS: 96-49-1 EINECS: 202-510-0	ethylene carbonate  Eye Dam. 1, H318	0 – 10%

(Contd. on page 3)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 2)

CAS: 7429-90-5 EINECS: 231-072-3	aluminium substance with a Community workplace exposure limit	3 – 9%
CAS: 21324-40-3 EINECS: 244-334-7	Lithiumhexafluorophosphat(1-) 	0.1 – 5%

Additional information: For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information:

In normal cases no specific measures needed.

It always applies:

In case of discomfort or doubt, seek medical advice.

If unconscious, use a stable lateral position and do not administer anything through mouth.

The following measures apply to contact with the contents of a damaged battery:

After inhalation:

Supply fresh air; consult doctor in case of complaints.

In case of unconsciousness place patient stably in side position for transportation.

After skin contact:

Immediately wash with water and soap and rinse thoroughly.

Take off contaminated clothing and wash it before reuse.

Seek medical treatment in case of complaints.

After eye contact:

Rinse opened eye for several minutes under running water.

Remove contact lenses, if present and easy to do. Continue rinsing.

Consult an ophthalmologist or eye clinic immediately.

After swallowing:

Rinse mouth thoroughly with cold water. Do not induce vomiting. If the patient is fully conscious, give one or two glass of water to drink. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed

Depending on the condition of the patients, the doctor must assess the symptoms and the overall general condition.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

For safety reasons unsuitable extinguishing agents: Water with full jet

5.2 Special hazards arising from the substance or mixture

Batteries may burst at high temperatures, which may result in flammable, toxic and/or corrosive vapours.

May form hydrofluoric acid if the electrolyte comes into contact with water.

(Contd. on page 4)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 3)

In case of fire, the following can be released:

COx

Hydrogen fluoride (HF)

5.3 Advice for firefighters

Protective equipment:

Wear self-contained respiratory protective device.

Wear fully protective suit.

Additional information

Remove container from fire, if possible without risk.

Cool endangered receptacles with water spray.

Ensure adequate ventilation.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Restricted access to the affected area until cleaning work is completed.

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Avoid skin and eye contact with damaged batteries.

6.2 Environmental precautions: Do not allow to enter sewers/ surface or ground water.

6.3 Methods and material for containment and cleaning up:

Cover leaked material with inert absorbent material (sand or soil) and dispose of in suitable containers.

Clean again.

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

In any case, the warnings on batteries and the instructions for use of devices and other applications must be carefully observed.

Use only the recommended battery types.

Lithium-ion batteries should preferably be stored at room temperature and dry (max. 40°C), large temperature fluctuations should be avoided. (e.g. do not store near heaters, do not permanently expose to sunlight).

Never open, mechanically damage or burn the battery!

Observe protective measures and safety instructions.

Information about fire - and explosion protection:

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

7.2 Conditions for safe storage, including any incompatibilities

Storage:

Requirements to be met by storerooms and receptacles:

Store in dry conditions.

Store in a cool location.

Protect from heat and direct sunlight.

Store in accordance with local/regional/national/international regulations.

(Contd. on page 5)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 4)

Information about storage in one common storage facility:

Store away from oxidising agents.

Do not store together with acids.

Further information about storage conditions:

Recharge at regular intervals during prolonged storage.

Store in original container.

Recommended storage temperature:

room temperature

Storage at room temperature (approx. 20°C) at approx. 20~60% of the nominal capacity.

Storage class: 11

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical facilities:

No further data; see item 7.

Technical measures and the use of suitable working methods take priority over the use of personal protective equipment.

8.1 Control parameters

Lithium-ion batteries are products from which no substances are released under normal and reasonably foreseeable conditions of use.

Ingredients with limit values that require monitoring at the workplace:

CAS: 7440-44-0 carbon

MAK (Austria)	Short-term value: 10 A mg/m ³ Long-term value: 5 A mg/m ³ (Alveolarstaub mit <1%Quartz)
AGW (Germany)	Long-term value: 1.25* 10** mg/m ³ 2(II);*alveolengängig**einatembar; AGS, DFG
WEL (Great Britain)	Long-term value: 10* 4** mg/m ³ *inhalable dust **respirable

CAS: 7440-50-8 copper

MAK (Austria)	Short-term value: 4E; 0.4A* mg/m ³ Long-term value: 1E; 0.1A* mg/m ³ als Cu berechnet; *als Rauch
MAK (Germany)	Long-term value: 0.01 A mg/m ³ als Cu
LEP (Spain)	Long-term value: 0.1 mg/m ³ fracción respirable, d
VLEP (France)	Short-term value: 2** mg/m ³ Long-term value: 0.2* 1** mg/m ³ *fumées **poussières, en Cu
WEL (Great Britain)	Short-term value: 2** mg/m ³ Long-term value: 0.2* 1** mg/m ³ *fume **dusts and mists (as Cu)

(Contd. on page 6)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 5)

TWA (Italy)	Long-term value: 0.2* 1* mg/m ³ *fumi; **polveri e nebbie
WGW (Netherland)	Long-term value: 0.1 mg/m ³ inhaleerbaar
CAS: 7429-90-5 aluminium	
MAK (Austria)	Short-term value: 20 E mg/m ³ Long-term value: 10 E mg/m ³ (als Metall)
AGW (Germany)	Long-term value: 1.25* 10** mg/m ³ 2(II);*alveolengängig**einatembar; AGS, DFG
LEP (Spain)	Long-term value: 10 5* mg/m ³ *Humos de soldadura, Polvos aluminotermia;como Al
VLEP (France)	Long-term value: 5* 10** mg/m ³ *pulvérulent **métal
WEL (Great Britain)	Long-term value: 10* 4** mg/m ³ *inhalable dust **respirable dust
TWA (Italy)	Long-term value: 1 mg/m ³ A4, (j); metallico e composti insolubili
WGW (Netherland)	Long-term value: 0.05* mg/m ³ *Metaal en onoplosbare verb., inadembaar (privaat)
CAS: 21324-40-3 Lithiumhexafluorophosphat(1-)	
AGW (Germany)	Long-term value: 0.2 E mg/m ³ 1(I);Y, 10, DFG, als Li

DNELs

CAS: 7440-50-8 copper

Oral	Long-term exposure - systemic effects	0.041 mg/kg bw/d (consumer)
Dermal	Long-term exposure - systemic effects	137 mg/kg bw/d (consumer)
		137 mg/kg bw/d (workers)
	short-term exposure - systemic effects	273 mg/kg bw (consumer)
Inhalative		273 mg/kg bw (workers)
	Long-term exposure - local effects	1 mg/m ³ (consumer)
	short-term exposure - local effects	1 mg/m ³ (consumer)

CAS: 7429-90-5 aluminium

Oral	Long-term exposure - systemic effects	7.9 mg/kg bw/d (consumer)
Inhalative	Long-term exposure - systemic effects	3.72 mg/m ³ (workers)
	Long-term exposure - local effects	3.72 mg/m ³ (workers)

PNECs

CAS: 7440-50-8 copper

fresh water	7.8 µg/l
sea water	5.2 µg/l
STP	0.23 mg/l

(Contd. on page 7)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 6)

sediment (fresh water)	87 mg/kg dw
sediment (sea water)	676 mg/kg dw
soil	65 mg/kg dw

Ingredients with biological limit values:

CAS: 7429-90-5 aluminium

BGW (Germany)	50 µg/g Kreatinin Untersuchungsmaterial: Urin Probennahmezeitpunkt: bei Langzeitexposition: am Schichtende nach mehreren vorangegangenen Schichten Parameter: Aluminium
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Additional information: The lists valid during the making were used as basis.

8.2 Exposure controls

Personal protective equipment:

General protective and hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Do not eat or drink while working.

Avoid skin and eye contact with damaged batteries.

Avoid inhalation of spilled material.

Take off contaminated clothing and wash it before reuse.

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye wash bottles and emergency showers should be provided in the immediate area near the workplace.

Respiratory protection: Not required when handling undamaged batteries.

Protection of hands:

Not required when handling undamaged batteries.

Wear protective gloves made of chloroprene or rubber if batteries are damaged.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection:

Not required when handling undamaged batteries.

Wear protective goggles if batteries are damaged.

Body protection: Not required when handling undamaged batteries.

Limitation and supervision of exposure into the environment

Do not allow to enter sewers/ surface or ground water.

(Contd. on page 8)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 7)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance:

Form:	Solid
Colour:	Various colours
Odour:	Odourless
Odour threshold:	No information available.
pH-value:	Not applicable.

Change in condition

Melting point/freezing point:	No information available.
Initial boiling point and boiling range:	No information available.

Flash point: Not applicable.

Flammability (solid, gas): Not determined.

Decomposition temperature: No information available.

Auto-ignition temperature: No information available.

Explosive properties: No information available.

Explosion limits:

Lower:	No information available.
Upper:	No information available.

Oxidising properties: No information available.

Vapour pressure: Not applicable.

Density: No information available.

Vapour density: Not applicable.

Evaporation rate: Not applicable.

Solubility in / Miscibility with water:

Insoluble.

Partition coefficient: n-octanol/water: No information available.

Viscosity:

Dynamic:	Not applicable.
Kinematic:	Not applicable.

9.2 Other information: No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity: No hazardous reactions known if stored and used as prescribed.

10.2 Chemical stability: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions: No further relevant information available.

(Contd. on page 9)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 8)

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Do not expose the rechargeable Li-Ion battery to mechanical shock.

Do not disassemble, crush, short-circuit, or connect with incorrect polarity. Avoid mechanical or electrical abuse.

10.5 Incompatible materials: No further relevant information available.

10.6 Hazardous decomposition products:

No decomposition if used and stored according to specifications.

With open cells there is the possibility of the release of hydrofluoric acid and carbon monoxide.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Inhalation: No probable route of exposure of the product itself. Inhalation of substances leaked from damaged batteries may irritate the respiratory tract and damage organs during prolonged or repeated exposure.

Skin contact: Contact with the undamaged battery does not present a hazard. Skin contact with damaged batteries may cause burns.

Eye contact: Contact with the undamaged battery does not constitute a hazard. Eye contact with spills from the damaged battery may cause burns.

Ingestion: No probable route of exposure of the product itself. Ingestion of spills may cause burns to the esophagus and stomach. Harmful if swallowed.

The product is declared as a product and is not subject to the CLP classification and labelling requirements.

Acute toxicity Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:

ATE (Acute Toxicity Estimates)

Oral	LD50	1,111 – 100,000 mg/kg
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CAS: 616-38-6 dimethyl carbonate

Oral	LD50	13,000 mg/kg (rat)
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Dermal	LD50	> 5,000 mg/kg (rabbit)
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CAS: 96-49-1 ethylene carbonate

Oral	LD50	10,000 mg/kg (rat)
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Primary irritant effect:

Skin corrosion/irritation

The electrolyte contained in the cell or battery is classified as a caustic liquid and causes skin burns.

Serious eye damage/irritation

The electrolyte contained in the cell or battery is classified as a corrosive liquid and causes serious eye damage.

Respiratory or skin sensitisation

The electrolyte contained in the cell or battery contains sensitizing substances.

Other information: There is no danger from the undamaged battery.

(Contd. on page 10)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 9)

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

Germ cell mutagenicity Based on available data, the classification criteria are not met.

Carcinogenicity The electrolyte contains nickel and cobalt compounds.

Reproductive toxicity The electrolyte contains cobalt compounds.

STOT-single exposure Based on available data, the classification criteria are not met.

STOT-repeated exposure The electrolyte contains nickel compounds.

Aspiration hazard Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability No further relevant information available.

12.3 Bioaccumulative potential No further relevant information available.

12.4 Mobility in soil No further relevant information available.

Additional ecological information:

General notes:

Water hazard class 3 (German Regulation) (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Avoid release to the environment.

12.5 Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Recommendation

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Dispose only through authorized companies in accordance with local regulations.

European waste catalogue

Notes: The European Waste Catalogue (EWC) classifies waste materials and categorises them according to what they are and how they were produced. This may cause other classifications. The final decision belongs to the last user.

16 06 05	other batteries and accumulators
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Uncleaned packaging:

Recommendation: Dispose of packaging according to regulations on the disposal of packagings.

SECTION 14: Transport information

14.1 UN-Number

ADR/RID/ADN, IMDG, IATA

UN3480

14.2 UN proper shipping name

ADR/RID/ADN

3480 LITHIUM ION BATTERIES

IMDG, IATA

LITHIUM ION BATTERIES

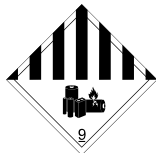
(Contd. on page 11)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 10)

14.3 Transport hazard class(es)

ADR/RID/ADN



Class 9 Miscellaneous dangerous substances and articles.
Label 9

IMDG, IATA



Class 9 Miscellaneous dangerous substances and articles.
Label 9A

14.4 Packing group

ADR/RID/ADN, IMDG, IATA not regulated

14.5 Environmental hazards: Not applicable.

14.6 Special precautions for user Warning: Miscellaneous dangerous substances and articles.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code Not applicable.

Transport/Additional information: **Special provision 188:**
The carriage of Li-ion batteries is not subject to the provisions of ADR/RID/IMDG if the requirements set out therein are met.

UN "Model Regulation": UN 3480 LITHIUM ION BATTERIES

SECTION 15: Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Labelling according to Regulation (EC) No 1272/2008**

According to REACH, the product is an article and therefore not subject to classification and labelling according to CLP Regulation (EC) No. 1272/2008.

There is no obligation to prepare safety data sheets for articles. This data sheet describes the safety requirements and is based on the safety data sheet according to REACH Regulation (EC) No. 1907/2006.

Directive 2012/18/EU

Named dangerous substances - ANNEX I None of the ingredients is listed.

National regulations:

Other regulations, limitations and prohibitive regulations

Substances of very high concern (SVHC) according to REACH, Article 57

Does not contain SVHC substances ≥ 0.1 %. (Status: 02/2020)

(Contd. on page 12)

Trade name: Lithium Ionen Akku / Akku-Pack (LiFePO4)

(Contd. of page 11)

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases

H225 Highly flammable liquid and vapour.

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.

H332 Harmful if inhaled.

H351 Suspected of causing cancer.

H360 May damage fertility or the unborn child.

H372 Causes damage to organs through prolonged or repeated exposure.

H413 May cause long lasting harmful effects to aquatic life.

Training hints

Regular training of staff involved in the transport of dangerous goods (in accordance with Chapter 1.3 ADR).

Department issuing SDS:

UmEnA GmbH

<http://umena.at>

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

SVHC: Substances of Very High Concern

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 2: Flammable liquids – Category 2

Acute Tox. 3: Acute toxicity - oral – Category 3

Acute Tox. 4: Acute toxicity - oral – Category 4

Skin Corr. 1A: Skin corrosion/irritation – Category 1A

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Skin Sens. 1: Skin sensitisation – Category 1

Carc. 2: Carcinogenicity – Category 2

Repr. 1B: Reproductive toxicity – Category 1B

STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

Aquatic Chronic 4: Hazardous to the aquatic environment - long-term aquatic hazard – Category 4