

1. Product and company identification

Product identifier

Trade name: 625B29 - Li-Ion-Akku

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

General use: Lithium-ion battery for orthopedic procedures
For commercial user only.

Details of the supplier of the safety data sheet

Company name: Otto Bock Health Care
Street/POB-No.: 3820 W. Great Lakes Drive
Postal Code, city: Salt Lake City, UT 84120
USA

WWW: www.ottobockus.com

Telephone: +1 (801) 956-2400

Telefax: +1 (801) 956-2401

Department responsible for information:

Quality Department,
Telephone: +1 (801) 954-2304 (7 AM – 3 PM, Mountain Time),
Email: USRegulatory@ottobock.com

Additional information: Corporate headquarters:
Ottobock SE & Co. KGaA
Max-Näder-Straße 15
Duderstadt
Germany

Emergency phone number

CHEMTREC, Telephone: +1 (800) 424-9300

Transport:

CONSULTANK Lutz Harder GmbH (Contract QUALI003)

Telephone: +49 (0)178-4337434 (from USA: 01149 178 4337434)

2. Hazards identification

Emergency overview

Appearance: Physical state at 68 °F and 101.3 kPa: solid

Color: metallic or black

Odor: odorless

Classification: Article not subject to hazard labelling or classification.

Regulatory status

This material is not considered hazardous by the U.S. OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazards not otherwise classified

The battery is hermetically sealed.

Avoid short circuit. Avoid damage to the battery casing

Danger of releasing ingredients, mentioned in section 3, by damaging the battery:

- with strong mechanical action,
- in case of heating and/or Fire,
- with influence of water,
- short circuit

Hazard statements:

Flammable liquid and vapor.

Toxic if swallowed. Harmful if inhaled. Causes severe skin burns and eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer. May damage fertility or the unborn child. May cause damage to organs. Causes damage to organs through prolonged or repeated exposure.

Very toxic to aquatic life with long lasting effects.

see section 11: Toxicological information

3. Composition / Information on ingredients

Chemical characterization: Article: Lithium-ion battery

The chemical materials are stored in a hermetically sealed metal case. The enclosure is not opened during the activity.

Contains:

Electrode, negative: Copper, Graphite, Carbon

Electrode, positive: Aluminium, Lithium oxides $\text{Li}[\text{M}]_m[\text{O}]_n \cdot 2$

M = Cobalt, Manganese, Nickel and/or Aluminium

Electrolyte: Ethyl methyl carbonate, Diethyl carbonate, Ethylene carbonate, Lithium hexafluorophosphate

Casing: Aluminium, Iron, Plastic

Relevant ingredients:

| CAS No. | Designation | Concentration | Classification |
|-----------------|---|---------------|--|
| CAS 12190-79-3 | Cobalt lithium dioxide | 20 - 60 % | Reproductive toxicant - Category 1B. |
| CAS 12031-65-1 | Lithium nickel dioxide | 20 - 60 % | Sensitization - skin - Category 1. Carcinogenicity - Category 1A. Specific Target Organ Toxicity (Repeated Exposure) - Category 1. |
| CAS 12057-17-9 | Lithium manganese oxide | 20 - 60 % | Acute Toxicity - oral - Category 4. Acute Toxicity - inhalative - Category 4. Aquatic toxicity - chronic - Category 4. |
| CAS 182442-95-1 | Lithium Cobalt Manganese Nickel Oxide | 20 - 60 % | Respiratory Sensitizer - Category 1. Sensitization - skin - Category 1. Carcinogenicity - Category 1A. Specific Target Organ Toxicity (Single Exposure) - Category 2. |
| CAS 207803-51-8 | Lithium nickel cobalt aluminium dioxide | 20 - 60 % | Sensitization - skin - Category 1. Carcinogenicity - Category 2. |
| CAS 623-53-0 | Ethyl methyl carbonate | 5 - 25 % | Flammable Liquid - Category 2. |
| CAS 105-58-8 | Diethyl carbonate | 5 - 25 % | Flammable Liquid - Category 3. |
| CAS 96-49-1 | Ethylene carbonate | 5 - 25 % | Acute Toxicity - oral - Category 4. Eye Irritation - Category 2A. Specific Target Organ Toxicity (Repeated Exposure) - Category 2. |
| CAS 21324-40-3 | Lithium hexafluorophosphate | 5 - 25 % | Acute Toxicity - oral - Category 3. Skin Corrosion - Category 1A. Eye Damage - Category 1. Specific Target Organ Toxicity (Repeated Exposure) - Category 1. |
| CAS 7440-50-8 | Copper | 1 - 15 % | Acute Toxicity - oral - Category 4. Aquatic toxicity - acute - Category 1 (M-factor = 10). Aquatic toxicity - chronic - Category 2. |

4. First aid measures

| | |
|-------------------------|--|
| General information: | In case of damaged battery cases: Release of dangerous ingredients possible. The product may release harmful vapors by heating. |
| In case of inhalation: | In case of damaged battery cases / In case of exposure to hazardous ingredients: Provide fresh air. Keep victim at rest in half upright position. Seek medical attention. |
| Following skin contact: | In case of damaged battery cases / In case of exposure to hazardous ingredients: Clean with plenty of water. If possible, also wash with polyethylene glycol 400. Take off immediately all contaminated clothing and wash it before reuse. Seek medical attention. |

After eye contact: In case of damaged battery cases / In case of exposure to hazardous ingredients: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. Seek the attention of an ophthalmologist immediately.

After swallowing: In case of damaged battery cases / In case of exposure to hazardous ingredients: Drink large quantities of water. Do not induce vomiting. Risk of perforation in case of vomiting! Immediately get medical attention. Do not try to neutralize.

Most important symptoms/effects, acute and delayed

No hazardous reaction when handled and stored according to provisions.

In case of damaged battery cases:

Toxic if swallowed. Harmful if inhaled. Causes severe skin burns and eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause damage to organs. Causes damage to organs through prolonged or repeated exposure.

Information to physician

Treat symptomatically.

5. Fire fighting measures

Flash point/flash point range:

Not applicable

Auto-ignition temperature: No data available

Suitable extinguishing media:

Only in case of small fires: metal fire extinguisher, sand

In case of large fires: water spray jet, dry chemical powder, nitrogen, carbon dioxide

Extinguishing media which must not be used for safety reasons:

Full water jet

Specific hazards arising from the chemical

In case of fire may be liberated: Corrosive gases/vapors, metal oxide smoke, carbon monoxide and carbon dioxide,

Protective equipment and precautions for firefighters:

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information:

Cool endangered containers with water spray and, if possible, remove from danger zone.

Danger of explosion!

Do not allow fire water to penetrate into surface or ground water.

6. Accidental release measures

Personal precautions:

In case of damaged battery cases:

Remove all sources of ignition. Avoid exposure.

Provide fresh air. Avoid contact with skin and eyes.

Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse.

In case of development of vapors or dust: Do not inhale vapors or dust particles.

Environmental precautions:

Product contains heavy metals. Discharge into the environment must be avoided. Special pre-treatment is necessary.

Methods for clean-up: Take up mechanically. Dispose of waste according to applicable legislation.
Avoid generation of dust.

Information about electrolyte:
Take up with non-flammable, liquid binding material (e.g. sand/earth/diatomaceous earth/vermiculit) and perform disposal according to instructions. Final cleaning.

7. Handling and storage

Handling

Advices on safe handling: Provide adequate ventilation, and local exhaust as needed.
Avoid damage to the battery casing.
In case of damaged battery cases:
Avoid exposure. Do not inhale vapors or dust particles. Avoid contact with skin and eyes.
Keep away from sources of ignition - No smoking. Wash hands before breaks and after work. Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse.

Precautions against fire and explosion:
Avoid short circuit. Avoid open flames.
Avoid temperatures exceeding 158 °F.
Avoid damage to the battery casing.
In case of damaged battery cases: Remove all sources of ignition.

Storage

Requirements for storerooms and containers:
Provide adequate ventilation. Store in a dry place. Keep only in original container.
Protect from: humidity, heat, UV-radiation/sunlight
Storage temperature: approx. 68 °F up to 104 °F
Air moisture: approx. 45 up to 85 %

Hints on joint storage: Do not store together with strong acids, strong oxidizing agents. Keep away from: Water, metals.
Keep away from food, drink and animal feedingstuffs.

8. Exposure controls / personal protection

Exposure guidelines

Occupational exposure limit values:

| CAS No. | Designation | Type | Limit value |
|------------|------------------------|---------------------|---|
| 12031-65-1 | Lithium nickel dioxide | USA: IDLH: TWA | 10 Ni/m ³ |
| 7429-90-5 | Aluminium | USA: ACGIH: TWA | 1 mg/m ³ |
| | | USA: NIOSH: Ceiling | 5 mg/m ³ (inhalable fraction) |
| | | USA: NIOSH: TWA | 10 mg/m ³ (inhalable fraction) |
| | | USA: NIOSH: TWA | 5 mg/m ³ (inhalable fraction) |
| | | USA: OSHA: TWA | 15 mg/m ³ (inhalable fraction) |
| | | USA: OSHA: TWA | 5 mg/m ³ (respirable fraction) |
| 7782-42-5 | Graphite | USA: ACGIH: TWA | 2 mg/m ³ (respirable fraction) |
| | | USA: IDLH: TWA | 1,250 mg/m ³ |
| | | USA: NIOSH: TWA | 2.5 mg/m ³ (respirable fraction) |
| | | USA: OSHA: TWA | 15 mg/m ³ (total dust) |
| | | USA: OSHA: TWA | 5 mg/m ³ (respirable fraction) |
| 7440-44-0 | Carbon | USA: ACGIH: TWA | 10 mg/m ³ |
| | | | (Dust limit value, inhalable fraction) |
| | | USA: ACGIH: TWA | 3 mg/m ³ |
| | | | (Dust limit value, respirable fraction) |
| | | USA: OSHA: TWA | 15 mg/m ³ (inhalable fraction) |
| | | USA: OSHA: TWA | 5 mg/m ³ (respirable fraction) |
| 7439-89-6 | Iron | USA: ACGIH: TWA | 10 mg/m ³ (smoke, dust) |
| | | USA: OSHA: TWA | 10 mg/m ³ (Smoke) |
| 7440-50-8 | Copper | USA: ACGIH: TWA | 0.2 mg/m ³ (Smoke) |
| | | USA: ACGIH: TWA | 1 mg/m ³ |
| | | | (Dusts and mist calculated as Cu) |
| | | USA: IDLH: TWA | 100 Cu/m ³ (dust and mist) |
| | | USA: IDLH: TWA | 100 Cu/m ³ (Smoke) |
| | | USA: NIOSH: TWA | 1 mg/m ³ |
| | | USA: OSHA: TWA | 0.1 mg/m ³ |
| | | | (Smoke; calculated as Cu) |
| | | USA: OSHA: TWA | 1 mg/m ³ |
| | | | (Dusts and mist calculated as Cu) |
| 1313-13-9 | Manganese dioxide | USA: IDLH: TWA | 500 Mn/m ³ |

Engineering controls

In case of damaged battery cases: Provide adequate ventilation.

In case of development of vapors or dust:

The use of local exhaust ventilation is recommended.

See also information in chapter 7, section storage.

Personal protection equipment (PPE)

Eye/face protection:

In case of damaged battery cases:

Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

| | |
|---------------------------------|--|
| Skin protection: | In case of damaged battery cases: Protective gloves according to OSHA Standard - 29 CFR: 1910.138. Observe glove manufacturer's instructions concerning penetrability and breakthrough time. |
| Respiratory protection: | Respiratory protection must be worn whenever the TLV (WEL) levels have been exceeded. The filter class must be suitable for the maximum contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, closed-circuit breathing apparatus must be used! |
| General hygiene considerations: | Avoid damage to the battery casing. In case of damaged battery cases: Avoid exposure. Do not inhale vapors or dust particles. Avoid contact with skin and eyes. Keep away from sources of ignition - No smoking. Wash hands before breaks and after work. Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse. |

Environmental exposure controls

Refer to 6.: Section "Environmental precautions".

9. Physical and chemical properties

Information on basic physical and chemical properties

| | |
|--|--|
| Appearance: | Physical state at 68 °F and 101.3 kPa: solid Color: metallic or black |
| Odor: | odorless |
| Odor threshold: | No data available |
| pH: | Not applicable |
| Melting point/freezing point: | No data available |
| Initial boiling point and boiling range: | No data available |
| Flash point/flash point range: | Not applicable |
| Evaporation rate: | No data available |
| Flammability: | No data available |
| Explosion limits: | No data available |
| Vapor pressure: | No data available |
| Vapor density: | No data available |
| Density: | No data available |
| Solubility: | No data available |
| Partition coefficient: n-octanol/water: | No data available |
| Auto-ignition temperature: | No data available |
| Thermal decomposition: | No data available |
| Additional information: | No data available |

10. Stability and reactivity

| | |
|---------------------|---|
| Reactivity: | Refer to subsection "Possibility of hazardous reactions". |
| Chemical stability: | Stable under recommended storage conditions. |

Possibility of hazardous reactions:

Fire hazard in case of technical defects.

In case of damaged battery cases:

Development of corrosive gases/vapours.

Flammable liquid and vapor. (Electrolyte)

Conditions to avoid:

In case of strong heating: development of gas/vapor possible.

Protect from: humidity, UV-radiation/sunlight. Avoid temperatures exceeding 158 °F.

Avoid short circuit. Avoid damage to the battery casing.

In case of damaged battery cases:

Keep away from water. Keep away from sources of ignition - No smoking.

Incompatible materials:

Keep away from strong acids, strong oxidizing agents, water, metals

Hazardous decomposition products:

No decomposition when used properly.

Thermal decomposition:

No data available

11. Toxicological information

Toxicological tests

Toxicological effects:

Acute toxicity (oral): Lack of data.

Acute toxicity (dermal): Lack of data.

Acute toxicity (inhalative): Lack of data.

Skin corrosion/irritation: Lack of data.

Serious eye damage/irritation: Lack of data.

Sensitisation to the respiratory tract: Lack of data.

Skin sensitisation: Lack of data.

Germ cell mutagenicity/Genotoxicity: Lack of data.

Carcinogenicity: Lack of data.

Reproductive toxicity: Lack of data.

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): Lack of data.

Specific target organ toxicity (repeated exposure): Lack of data.

Aspiration hazard: Lack of data.

Other information:

In case of damaged battery cases:

Toxic if swallowed. Harmful if inhaled. Causes severe skin burns and eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer. May damage fertility or the unborn child. May cause damage to organs. Causes damage to organs through prolonged or repeated exposure.

Information about electrolyte:

LD50 Rat, oral: $\geq 2,000$ mg/kg

Symptoms

After eye contact: Upon direct contact with eyes may cause burning, tearing, redness.

12. Ecological information

Ecotoxicity

Aquatic toxicity: In case of damaged battery cases:
Very toxic to aquatic life with long lasting effects.

Mobility in soil

No data available

Persistence and degradability

Further details: Product is not biodegradable.

Additional ecological information

General information: Product contains heavy metals. Discharge into the environment must be avoided. Special pre-treatment is necessary.

13. Disposal considerations

Product

Recommendation: Dispose of waste according to applicable legislation.

Package

Recommendation: Dispose of waste according to applicable legislation.
Packing can be recycled or disposed of.

14. Transport information

UN number

ADR/RID, IMDG, IATA-DGR:
UN 3480

UN proper shipping name

ADR/RID, IMDG, IATA-DGR:
UN 3480, LITHIUM ION BATTERIES

Transport hazard class(es)

ADR/RID: Class 9, Code: M4
IMDG: Class 9, Subrisk -
IATA-DGR: Class 9



Packing group

ADR/RID, IATA-DGR: not applicable
IMDG: -

Environmental hazards

Marine pollutant: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No data available

USA: Department of Transportation (DOT)

Identification number: UN3480
 Proper shipping name: UN 3480, LITHIUM ION BATTERIES
 Hazard class or Division: 9
 Labels: 9
 Special Provisions: 388, 422, A54, A100
 Packaging – Exceptions: 185
 Packaging – Non-bulk: 185
 Packaging – Bulk: 185
 Quantity limitations – Passenger aircraft / rail: Forbidden
 Quantity limitations – Cargo only: 35 kg
 Vessel stowage – Location: A
 Vessel stowage – Other: 156



Sea transport (IMDG)

UN number: UN 3480
 Proper shipping name: UN 3480, LITHIUM ION BATTERIES
 Class or division, Subsidiary risk: Class 9, Subrisk -
 Packing Group: -
 EmS: F-A, S-I
 Special Provisions: 188 230 310 348 376 377 384 387
 Limited quantities: 0
 Excepted quantities: E0
 Package - Instructions: P903, P908, P909, P910, P911, LP903, LP904, LP905, LP906
 Package - Provisions: -
 IBC - Instructions: -
 IBC - Provisions: -
 Tank instructions - IMO: -
 Tank instructions - UN: -
 Tank instructions - Provisions: -
 Stowage and handling: Category A. SW19
 Properties and observations: Electrical batteries containing lithium ion may react (e.g., flame, heat, emission of toxic, corrosive or flammable gases or vapours) or disassemble due to damage, defects or short circuit.
 Marine pollutant: no
 Segregation group: none

Air transport (IATA)

UN/ID number: UN 3480
 Proper shipping name: UN 3480, LITHIUM ION BATTERIES
 Class or division, Subsidiary risk: Class 9
 Hazard label: Lithium batt or Sodium-ion batt
 Excepted Quantity Code: E0
 Passenger and Cargo Aircraft: Ltd.Qty.: Forbidden
 Passenger and Cargo Aircraft: Forbidden
 Cargo Aircraft only: Pack.Instr. See 965 - Max. Net Qty/Pkg. See 965
 Special Provisions: A88 A99 A154 A183 A201 A213 A331 A334 A802
 Emergency Response Guide-Code (ERG): 12FZ

15. Regulatory information

National regulations - U.S. Federal Regulations

This product is an article as defined by TSCA regulations, and is exempt from TSCA inventory listing requirements.

National regulations - U.S. State Regulations

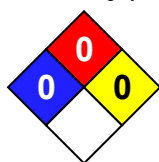
Lithium nickel dioxide: California Proposition 65: cancer

Cobalt oxide: California Proposition 65: cancer

Nickel monoxide: California Proposition 65: cancer

16. Other information

Hazard rating systems:



NFPA Hazard Rating:

Health: 0 (Minimal)

Fire: 0 (Minimal)

Reactivity: 0 (Minimal)

HMIS Version III Rating:

Health: 0 (Minimal)

Flammability: 0 (Minimal)

Physical Hazard: 0 (Minimal)

Personal Protection: X = Consult your supervisor

| | |
|-----------------|---|
| HEALTH | 0 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARD | 0 |
| | X |

In case of damaged battery cases: NFPA/HMIS: H3 / F2

Abbreviations and acronyms:

Acute Toxicity: Acute toxicity
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
 Aquatic toxicity - acute: Hazardous to the aquatic environment - acute
 Aquatic toxicity - chronic: Hazardous to the aquatic environment - chronic
 AS/NZS: Australian Standards/New Zealand Standards
 Carcinogenicity: Carcinogenicity
 CAS: Chemical Abstracts Service
 CFR: Code of Federal Regulations
 CLP: Classification, Labelling and Packaging
 DMEL: Derived minimal effect level
 DNEL: Derived no-effect level
 EC: European Community
 EmS: Emergency Response Procedures for Ships Carrying Dangerous Goods
 EN: European Standard
 EQ: Excepted quantities
 Eye Damage: Eye damage
 Eye Irritation: Eye irritation
 Flammable Liquid: Flammable liquid
 IATA: International Air Transport Association
 IATA-DGR: International Air Transport Association – Dangerous Goods Regulations
 IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
 IMDG Code: International Maritime Dangerous Goods Code
 IMO: International Maritime Organization
 LD50: Lethal dose 50%
 MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships
 M-factor: Multiplication factor
 OEL: Occupational Exposure Limit Value
 OSHA: Occupational Safety and Health Administration
 PBT: Persistent, bioaccumulative and toxic
 PNEC: Predicted no-effect concentration
 Reproductive toxicant: Reproductive toxicity
 Respiratory Sensitizer: Sensitisation to the respiratory tract
 RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail
 Sensitization - skin: Skin sensitisation
 Skin Corrosion: Skin corrosion

STOT RE: Specific target organ toxicity - repeated exposure

STOT SE: Specific target organ toxicity - single exposure

TLV: Threshold Limit Value

TRGS: Technical Rules for Hazardous Substances

TSCA: Toxic Substance Control Act

UN: United Nations

UV: Ultraviolet

vPvB: Very persistent and very bioaccumulative

WEL: Workplace Exposure Limit

Reason of change: Changes in section 14: IMDG 2025

Date of first version: 9/18/2023

Department issuing data sheet

Contact person: see section 1: Department responsible for information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.