

1. Product and company identification

Product identifier

Trade name: 625B18/625B21 - Lithium Ionen Batterie

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:

Highly flammable liquid and vapor.

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

Harmful 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, Carbon

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

M = Cobalt, Manganese, Nickel and/or Aluminium

Electrolyte: electrolytes, organic

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 %	Acute Toxicity - inhalative - Category 2. Carcinogenicity - Category 1B. Specific Target Organ Toxicity (Repeated Exposure) - Category 1. Aquatic toxicity - chronic - Category 3.
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.

Additional information: Contains: Aluminium, Graphite, Carbon, Copper, Iron. The maximum workplace exposure limits are, where necessary, listed in section 8.
The chemical materials are stored in a hermetically sealed metal case. The enclosure is not opened during the activity.

4. First aid measures

General information: In case of damaged battery cases: Release of dangerous ingredients possible. In case of heating: development of gas/vapor possible.

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: Immediately clean with water and soap and, if available, apply a generous amount of polyethylene glycol 400 or protective skin cream.
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 / In case of exposure to hazardous ingredients:
Toxic if swallowed. Fatal if inhaled. Causes severe skin burns and eye damage. May cause an allergic skin reaction. 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: Water spray jet, dry chemical powder, foam, nitrogen, carbon dioxide

Extinguishing media which must not be used for safety reasons: Full water jet

Specific hazards arising from the chemical

> 212 °F: Generation of heat. Ignition.
In case of fire may be liberated: Toxic metal oxide smoke, corrosive gases/vapors, toxic gases/vapors, hydrogen fluoride, 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:
Eliminate all ignition sources if safe to do so.
Provide fresh air. Avoid exposure. 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, organic:
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents) and place in closed containers for disposal. 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: Eliminate all ignition sources if safe to do so.

Storage

Requirements for storerooms and containers:
Provide adequate ventilation. Store in a dry place.
Protect from: humidity, heat, UV-radiation/sunlight
Storage temperature: -4 °F up to 104 °F.
Air humidity: 45% up to 85%.
SoC (state-of-charge): ≤ 50%

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)
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)
7439-89-6	Iron	USA: ACGIH: TWA	10 mg/m ³ (smoke, dust)
		USA: OSHA: TWA	10 mg/m ³ (Smoke)

Additional information: The chemical materials are stored in a sealed battery case.

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: Do not inhale vapors or dust particles. Avoid exposure. Avoid contact with skin and eyes. Keep away from sources of ignition - No smoking. Wash hands before breaks and after work. 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".
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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. Highly flammable liquid and vapor. (Electrolyte)
Conditions to avoid:	In case of strong heating: Generation of heat. Ignition. Protect from: humidity, heat, UV-radiation/sunlight Avoid temperatures exceeding 176 °F. Avoid short circuit. Avoid damage to the battery casing. In case of damaged battery cases: Keep away from sources of ignition - No smoking.
Incompatible materials:	Keep away from strong acids and strong oxidizing agents. In case of damaged battery cases: Keep away from water.
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:	No hazardous reaction when handled and stored according to provisions. In case of damaged battery cases: Toxic if swallowed. Fatal if inhaled. Causes severe skin burns and eye damage. May cause an allergic skin reaction. 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:
Harmful 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: Product contains Metallic oxides containing heavy metals.
Recycling or special waste incineration.

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: UN3090
Proper shipping name: UN 3090, LITHIUM METAL BATTERIES
Hazard class or Division: 9
Labels: 9
Special Provisions: 388, 422, A54
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

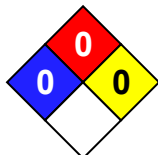
This product is an article as defined by TSCA regulations, and is exempt from TSCA inventory listing requirements.

National regulations - U.S. State Regulations

Lithium nickel dioxide: California Proposition 65: cancer

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

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

HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
	X

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 - 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
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
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
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: 8/9/2018

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.