

## 1. Identification

### Product identifier

Trade name: 2B2- Lithium-Ionen-Zelle

### 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  
Zip code, city: Salt Lake City, UT 84120  
USA

WWW: [www.ottobockus.com](http://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](mailto:USRegulatory@ottobock.com)

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

### Emergency telephone 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. Hazard identification

### Classification of the substance or mixture

Article not subject to hazard labelling or classification.

### Label elements

not applicable

## Other hazards

The battery is hermetically sealed.

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:

Suspected of causing cancer. May cause an allergic skin reaction.

In contact with water releases flammable gases. Formation of Hydrogen fluoride.

Toxic if swallowed. Causes severe skin burns and eye damage. Causes damage to organs through prolonged or repeated exposure. Vapors may cause drowsiness and dizziness.

## 3. Composition/information on ingredients

### Mixtures

Chemical characterization: Lithium-ion battery - Article, Cell.

The chemical materials are stored in a hermetically sealed metal case.

Contains Polyvinylidene fluoride, Iron, Graphite and Carbon, Copper, Aluminium.

Relevant ingredients:

CAS No.	Designation	Concentration	Classification
CAS 207803-51-8	Lithium nickel cobalt aluminium dioxide	20 - 60 %	Sensitization - skin - Category 1. Carcinogenicity - Category 2.
CAS 141-78-6	Ethyl acetate	5 - 25 %	Flammable Liquid - Category 2. Eye Irritation - Category 2A. Specific Target Organ Toxicity (Single Exposure) - Category 3.
CAS 96-49-1	Ethylene carbonate	5 - 25 %	Eye Damage - Category 1.
CAS 616-38-6	Dimethyl carbonate	5 - 25 %	Flammable Liquid - 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.

The actual concentration or concentration range is withheld as a trade secret.

Additional information: The maximum workplace exposure limits are, where necessary, listed in section 8.

## 4. First aid measures

General information: In case of damaged battery cases: Release of dangerous ingredients possible. In case of heating: The product may release harmful vapors by heating..

In case of inhalation: In case of damaged battery cases:  
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. 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. Afterwards, consult 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: May cause an allergic skin reaction. Vapors may cause drowsiness and dizziness. Toxic if swallowed. Causes severe skin burns and eye damage. May cause cancer. Causes damage to organs through prolonged or repeated exposure. Other symptoms: respiratory complaints, irritation.

### Information to physician

Treat symptomatically.

## 5. Fire-fighting measures

### Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:

fire extinguisher class D, metal fire extinguisher.

### Specific hazards arising from the chemical

> 212 °F: Danger of explosion!

In case of fire may be liberated: Toxic metal oxide smoke, toxic gases/vapors, hydrogen fluoride, carbon monoxide and carbon dioxide.

### Protective equipment and precautions for firefighters

Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing.

## 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

In case of damaged battery cases:  
Eliminate all ignition sources if safe to do so.  
Provide fresh air. Avoid exposure.  
Wear appropriate protective equipment.  
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 and material for containment and cleaning up

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

### Precautions for safe 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.

Precautions against fire and explosion:  
Avoid short circuit. Avoid open flames. Avoid damage to the battery casing.  
In case of damaged battery cases: Eliminate all ignition sources if safe to do so.

### Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:  
Provide adequate ventilation. Store in a dry place.  
Protect from: humidity, heat, UV-radiation/sunlight  
charging temperature: 32 °F up to 113 °F.  
discharging temperature: -4 °F up to 140 °F.  
Storage temperature: -4 °F up to 113 °F.  
Air humidity: 0% up to 80%.

Hints on joint storage: Do not store together with strong acids, strong oxidizing agents.

## 8. Exposure controls/personal protection

### Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
7782-42-5	Graphite	USA: ACGIH: TWA	2 mg/m <sup>3</sup> (respirable fraction)
		USA: IDLH: TWA	1,250 mg/m <sup>3</sup>
		USA: NIOSH: TWA	2.5 mg/m <sup>3</sup> (respirable fraction)
		USA: OSHA: TWA	15 mg/m <sup>3</sup> (total dust)
		USA: OSHA: TWA	5 mg/m <sup>3</sup> (respirable fraction)
141-78-6	Ethyl acetate	USA: ACGIH: STEL	200 ppm
		USA: ACGIH: TWA	100 ppm
		USA: IDLH: TWA	2,000 ppm [10% LEL]
		USA: NIOSH: TWA	1,400 mg/m <sup>3</sup> ; 400 ppm
		USA: OSHA: TWA	1,400 mg/m <sup>3</sup> ; 400 ppm

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

### Appropriate 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.

### Personal protection equipment (PPE)

**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!

**Hand protection:** In case of damaged battery cases:  
Protective gloves according to OSHA Standard - 29 CFR: 1910.138.  
Glove material: rubber - breakthrough time >480 min.  
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

**Eye protection:** In case of damaged battery cases:  
Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

**General hygiene considerations:**  
In case of damaged battery cases:  
Do not inhale vapors or dust particles.  
Avoid exposure.  
Keep away from sources of ignition - No smoking.  
Wash hands before breaks and after work. When using do not eat or drink.  
Keep away from food, drink and animal feedingstuffs.  
Work place should be equipped with a shower and an eye rinsing apparatus.

### Environmental exposure controls

Refer to 6.: Section "Environmental precautions".

## 9. Physical and chemical properties

### Information on basic physical and chemical properties

Physical state at 68 °F and 101.3 kPa	solid
Color:	No data available
Odor:	No data available
Odor threshold:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	No data available
Flammability:	No data available
Explosion limits:	No data available
Flash point/flash point range:	Not applicable
Evaporation rate:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	> 212 °F: Danger of explosion!
pH:	Not applicable
Viscosity:	No data available
Solubility:	No data available
Partition coefficient: n-octanol/water:	No data available

Vapor pressure: No data available  
 Density: No data available  
 Vapor density: No data available  
 Particle characteristics: No data available

### Additional information

Additional information: weight: 45 g

## 10. Stability and reactivity

Reactivity: In case of damaged battery cases:  
 May be corrosive to metals.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions:  
 Fire hazard in case of technical defects.  
 In case of damaged battery cases:  
 Flammable liquid and vapor. (Electrolyte)  
 After contact with water: formation of Hydrogen fluoride.

Conditions to avoid: In case of strong heating: development of gas/vapor possible.  
 Protect from: humidity, heat, UV-radiation/sunlight  
 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.

## 11. Toxicological information

### Information on toxicological effects

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 / In case of exposure to hazardous ingredients:
- Suspected of causing cancer. May cause an allergic skin reaction. Toxic if swallowed.
- Causes severe skin burns and eye damage. Causes damage to organs through prolonged or repeated exposure. Vapors may cause drowsiness and dizziness.

## 12. Ecological information

### Ecotoxicity

Further details: No data available

### Persistence and degradability

Further details: Product is not biodegradable.

### Bioaccumulative potential

Partition coefficient: n-octanol/water:  
No data available

### Mobility in soil

No data available

### Other adverse effects

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

### 13. Disposal considerations

#### Waste treatment methods

##### Product

Recommendation: Product contains Metallic oxides containing heavy metals.  
Special waste. 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

DOT: UN3090  
IMDG, IATA-DGR: UN 3480

#### UN proper shipping name

DOT: UN 3090, LITHIUM METAL BATTERIES  
IMDG, IATA-DGR: UN 3480, LITHIUM ION BATTERIES

#### Transport hazard class(es)

DOT: 9  
IMDG: Class 9, Subrisk -  
IATA-DGR: Class 9



#### Packing group

DOT, IATA-DGR: not applicable  
IMDG: -

#### Environmental hazards

Marine pollutant: no

#### Transport in bulk according to IMO instruments

No data available

#### Special precautions for user

##### USA: Department of Transportation (DOT)

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)

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)

Proper shipping name:	UN 3480, LITHIUM ION BATTERIES
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

Ethyl acetate: New York Right-To-Know: listed

### Further regulations, limitations and legal requirements

No data available

## 16. Other information

Revision date:	1/1/2026
Date of first version:	2/28/2019
Reason of change:	Changes in section 14: IATA-DGR 2026

Hazard rating systems:



**NFPA Hazard Rating:**

Health: 0 (Minimal)

Fire: 1 (Slight)

Reactivity: 1 (Slight)

**HMIS Version III Rating:**

Health: 0 (Minimal)

Flammability: 1 (Slight)

Physical Hazard: 1 (Slight)

Personal Protection: X = Consult your supervisor

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	1
	X

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

Abbreviations and acronyms:

Acute Toxicity: Acute toxicity  
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  
DOT: Department of Transportation's Safety Regulations (USA)  
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  
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  
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

**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.