



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

### 1.1. Product identifier

Lithium-ion batteries

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

#### Use of the substance/mixture

Lithium-Ion battery

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

### 1.3. Details of the supplier of the safety data sheet

Company name: Robert Bosch GmbH  
Automotive Aftermarket  
Place: D-76227 Karlsruhe  
Telephone: +49 721-942-0  
Responsible Department: Responsible for the safety data sheet: sds@gbk-ingelheim.de

1.4. Emergency telephone +49 (0) 6132 / 84463 (GBK GmbH)  
number:

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### Classification according to Directive 67/548/EEC or 1999/45/EC

This mixture is not classified as hazardous in accordance with Directive 1999/45/EC.

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Hazard categories:

Acute toxicity: Acute Tox. 4

Skin corrosion/irritation: Skin Corr. 1A

Serious eye damage/eye irritation: Eye Dam. 1

Respiratory or skin sensitisation: Skin Sens. 1

Carcinogenicity: Carc. 2

Specific target organ toxicity - repeated exposure: STOT RE 2

Hazard Statements:

Harmful if swallowed.

Causes severe skin burns and eye damage.

Causes serious eye damage.

May cause an allergic skin reaction.

Suspected of causing cancer.

May cause damage to organs through prolonged or repeated exposure.

### 2.2. Label elements

#### Hazard components for labelling

Lithium hexafluorophosphate

Ethylene carbonate

nickel powder

Signal word:

Danger

Pictograms:

GHS05-GHS07-GHS08





**Hazard statements**

|      |  |
|------|--|
| H302 | Harmful if swallowed.  |
| H314 | Causes severe skin burns and eye damage.                           |
| H317 | May cause an allergic skin reaction.                               |
| H351 | Suspected of causing cancer.                                       |
| H373 | May cause damage to organs through prolonged or repeated exposure. |

**Precautionary statements**

|                |  |
|----------------|--|
| P260           | Do not breathe dust/fume/gas/mist/vapours/spray.   |
| P264           | Wash Hands thoroughly after handling.  |
| P280           | Wear protective gloves/protective clothing/eye protection/face protection.   |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.   |
| P303+P361+P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.                              |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P310           | Immediately call a POISON CENTER/doctor.   |

**Additional advice on labelling**

There is no hazard when the measures for handling and storage are followed.

**2.3. Other hazards**

No hazards in case of an intact battery and observation of the instructions for use.

---

**SECTION 3: Composition/information on ingredients**

**3.2. Mixtures**

**Chemical characterization**

Lithium-Ion battery

**Hazardous components**

| EC No            | Chemical name  | Quantity |
|------------------|--|----------|
| CAS No           | Classification according to Directive 67/548/EEC                         |          |
| Index No         | Classification according to Regulation (EC) No. 1272/2008 [CLP]          |          |
| REACH No         |  |          |
| 476-700-9        | Iron lithium phosphate   | 50 %     |
| 15365-14-7       |  |          |
| 231-955-3        | Graphite   | 10 %     |
| 7782-42-5        |  |          |
| 01-2119486977-12 |  |          |
| 202-510-0        | Ethylene carbonate   | 5 %      |
| 96-49-1          |  |          |
|                  | Acute Tox. 4, Eye Irrit. 2, STOT RE 2; H302 H319 H373                    |          |
| 210-478-4        | dimethyl carbonate   | 5 %      |
| 616-38-6         | F - Highly flammable R11   |          |
| 607-013-00-6     | Flam. Liq. 2; H225   |          |
| 231-159-6        | Copper   | 5 %      |
| 7440-50-8        |  |          |
|                  | Aquatic Chronic 4; H413  |          |
| 01-2119480154-42 |  |          |
|                  | Polyethylene   | 5 %      |
| 9002-88-4        |  |          |
|                  |  |          |
|                  | Polypropylene, homopolymer   | 5 %      |
| 9003-07-0        |  |          |
| 244-334-7        | Lithium hexafluorophosphate  | 5 %      |
| 21324-40-3       | T - Toxic, C - Corrosive R25-35-48/23/24/25                              |          |
|                  | Acute Tox. 3, Skin Corr. 1A, STOT RE 1; H301 H314 H372                   |          |
| 231-111-4        | nickel powder  | 2,5 %    |
| 7440-02-0        | Carc. Cat. 3, T - Toxic R40-48/23-43-52-53                               |          |
| 028-002-01-4     | Carc. 2, Skin Sens. 1, STOT RE 1, Aquatic Chronic 3; H351 H317 H372 H412 |          |
| 01-2119438727-29 |  |          |
|                  | Poly(vinylidene fluoride) (PVDF)   | 2 %      |
| 24937-79-9       |  |          |
|                  |  |          |
|                  | Carboxymethyl cellulose  | 0,5 %    |
| 9004-32-4        |  |          |
|                  |  |          |

Full text of R, H and EUH phrases: see section 16.

**Further Information**

Because of the cell structure the dangerous ingredients will not be available if used properly.

Undamaged, closed cells do not represent a danger to the health.

**SECTION 4: First aid measures****4.1. Description of first aid measures**



### General information

The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

#### After inhalation

Ensure of fresh air.

Rinse mouth.

Call a physician immediately.

#### After contact with skin

Wash off immediately with plenty of water for at least 15 minutes.

Call a physician immediately.

#### After contact with eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Seek medical treatment by eye specialist.

#### After ingestion

Rinse mouth.

Drink plenty of water or milk.

Never give anything by mouth to an unconscious person.

Do not induce vomiting.

Call a physician immediately.

### **4.2. Most important symptoms and effects, both acute and delayed**

In case of electrolyte leakage:

Causes severe irritation of eyes, skin and mucous membranes.

### **4.3. Indication of any immediate medical attention and special treatment needed**

Treat symptoms.

---

## SECTION 5: Firefighting measures

### **5.1. Extinguishing media**

#### **Suitable extinguishing media**

In case of fire use extinguishing powder or sand.

#### **Unsuitable extinguishing media**

Never use water.

### **5.2. Special hazards arising from the substance or mixture**

Heat development under short-circuit conditions.

Fire may produce: toxic gases/vapours, Metallic oxides, carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>).

### **5.3. Advice for firefighters**

In case of fire, wear suitable respiratory equipment with positive air supply.

Protective suit.

---

## SECTION 6: Accidental release measures

### **6.1. Personal precautions, protective equipment and emergency procedures**

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Keep away noninvolved persons.

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.

### **6.2. Environmental precautions**

Do not discharge into the drains/surface waters/ground water.

### **6.3. Methods and material for containment and cleaning up**

Take up mechanically and collect in suitable container for disposal.

Waste disposal according to local regulations.

### **6.4. Reference to other sections**

Information for safe handling look up chapter 7.

Information for personal protective equipment look up chapter 8.

Information for disposal see section 13.

---

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling****Advice on safe handling**

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.

Follow the directions.

Keep away from water.

Do not throw into fire.

Follow the directions.

**Advice on protection against fire and explosion**

Keep away from open flames, hot surfaces and sources of ignition.

**7.2. Conditions for safe storage, including any incompatibilities****Requirements for storage rooms and vessels**

Store in a dry, cool and well-ventilated place.

**Further information on storage conditions**

Protect from heat and direct solar radiation.

**7.3. Specific end use(s)**

Lithium-Ion battery

Note: This product is an "article".

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Exposure limits (EH40)**

| CAS No     | Substance                        | ppm | mg/m <sup>3</sup> | fibres/ml | Category      | Origin |
|------------|----------------------------------|-----|-------------------|-----------|---------------|--------|
| 7429-90-5  | Aluminium metal, respirable dust | -   | 4                 |           | TWA (8 h)     | WEL    |
|            |                                  | -   | -                 |           | STEL (15 min) | WEL    |
| 7440-50-8  | Copper, fume                     | -   | 0.2               |           | TWA (8 h)     | WEL    |
|            |                                  | -   | -                 |           | STEL (15 min) | WEL    |
| 16984-48-8 | Fluoride (inorganic as F)        | -   | 2.5               |           | TWA (8 h)     | WEL    |
|            |                                  | -   | -                 |           | STEL (15 min) | WEL    |

**8.2. Exposure controls****Appropriate engineering controls**

No information available.

**Protective and hygiene measures**

No special measures necessary if used correctly.

**Eye/face protection**

No special measures necessary if used correctly.

**Hand protection**

No special measures necessary if used correctly.

**Skin protection**

No special measures necessary if used correctly.

**Respiratory protection**

No special measures necessary if used correctly.

**Environmental exposure controls**

No special measures necessary if used correctly.

**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Physical state:

Solid

Colour:

White (Aluminium)

Odour:

Odourless



---

**Changes in the physical state**

**9.2. Other information**

Voltage: 2,75 - 48 V

Weight: 10 - 4000 g

Current: 100 - 40000 mAh

---

**SECTION 10: Stability and reactivity**

**10.1. Reactivity**

No uncommon reactivity known.

**10.2. Chemical stability**

Stable under normal conditions.

**10.3. Possibility of hazardous reactions**

No known hazardous reactions.

**10.4. Conditions to avoid**

Short circuit

Avoid shock and impact.

Avoid high temperatures. (> 100 °C)

Protect against direct sun radiation.

Protect from atmospheric moisture and water.

**10.5. Incompatible materials**

Marine water, water, acids, oxidizing agents, electrical materials.

**10.6. Hazardous decomposition products**

No decomposition if stored and applied as directed.

Heat development under short-circuit conditions.

Fire may produce: toxic gases/vapours, Metallic oxides, carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>).

---

**SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

**Acute toxicity**

Harmful if swallowed.

**Irritation and corrosivity**

Causes severe skin burns and eye damage.

**Sensitising effects**

May cause an allergic skin reaction. (nickel powder)

**STOT-single exposure**

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

**Severe effects after repeated or prolonged exposure**

May cause damage to organs through prolonged or repeated exposure. (Lithium hexafluorophosphate; nickel powder)

**Carcinogenic/mutagenic/toxic effects for reproduction**

Suspected of causing cancer. (nickel powder)

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

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

**Aspiration hazard**

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

**Practical experience**

**Other observations**

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

---

**SECTION 12: Ecological information**

**12.1. Toxicity**



No information available.

**12.2. Persistence and degradability**

No information available.

**12.3. Bioaccumulative potential**

No information available.

**12.4. Mobility in soil**

No information available.

**12.5. Results of PBT and vPvB assessment**

No information available.

**12.6. Other adverse effects**

Harmful to the environment

Should not be released into the environment.

---

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

**Advice on disposal**

The point of sale, the manufacturers and importers of batteries take back used batteries, and render them to the secondary lead smelters for processing.

**Waste disposal number of waste from residues/unused products**

160605 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; batteries and accumulators; other batteries and accumulators

---

**SECTION 14: Transport information**

**Land transport (ADR/RID)**

**14.1. UN number:**

UN 3480

**14.2. UN proper shipping name:**

LITHIUM ION BATTERIES

**14.3. Transport hazard class(es):**

9

**14.4. Packing group:**

-

Hazard label:

9A



Classification code:

M4

Special Provisions:

188 230 310 348 376 377 636

Limited quantity:

0

Transport category:

2

Tunnel restriction code:

E

**Other applicable information (land transport)**

Special provision 188: Product is not subject to ADR/RID.

**Inland waterways transport (ADN)**

**14.1. UN number:**

UN 3480

**14.2. UN proper shipping name:**

Lithium-ion battery

**14.3. Transport hazard class(es):**

9

**14.4. Packing group:**

-

Hazard label:

9A



Classification code:

M4

Special Provisions:

188 230 310 348 376 377 636

Limited quantity:

0



**Other applicable information (inland waterways transport)**

Special provision 188: Product is not subject to ADN.

**Marine transport (IMDG)**

**14.1. UN number:** UN 3480  
**14.2. UN proper shipping name:** LITHIUM ION BATTERIES  
**14.3. Transport hazard class(es):** 9  
**14.4. Packing group:** -  
 Hazard label: 9



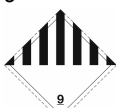
Special Provisions: 188, 230, 310, 348, 376, 377, 384  
 Limited quantity: 0  
 EmS: F-A, S-I

**Other applicable information (marine transport)**

Special provision 188: Product is not subject to IMDG Code.

**Air transport (ICAO-TI/IATA-DGR)**

**14.1. UN number:** UN 3480  
**14.2. UN proper shipping name:** LITHIUM ION BATTERIES  
**14.3. Transport hazard class(es):** 9  
**14.4. Packing group:** -  
 Hazard label: 9



Special Provisions: A88 A99 A154 A164 A183 A201 A206 A331  
 Limited quantity Passenger: Forbidden  
 IATA-packing instructions - Passenger: Forbidden  
 IATA-max. quantity - Passenger: Forbidden  
 IATA-packing instructions - Cargo: See 965  
 IATA-max. quantity - Cargo: See 965

**Other applicable information (air transport)**

Packing instructions 965 Part 2: Product is not subject to IATA-DGR.

**14.5. Environmental hazards**

ENVIRONMENTALLY HAZARDOUS: no

**14.6. Special precautions for user**

To avoid risks to human health and the environment, comply with the instructions for use.

**14.7. Transport in bulk according to Annex II of Marpol and the IBC Code**

The transport takes place only in approved and appropriate packaging.

**SECTION 15: Regulatory information**

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

**EU regulatory information**

**Additional information**

No information available.

**National regulatory information**

**Additional information**

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.





## **15.2. Chemical safety assessment**

Chemical safety assessments for substances in this mixture were not carried out.

## **SECTION 16: Other information**

### **Changes**

Changes in chapter: -

### **Abbreviations and acronyms**

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route

RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses

ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure

IMDG = International Maritime Code for Dangerous Goods

IATA/ICAO = International Air Transport Association / International Civil Aviation Organization

MARPOL = International Convention for the Prevention of Pollution from Ships

DOT = Department of Transportation

TDG = Transport of Dangerous Goods

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

REACH = Registration, Evaluation, Authorization and Restriction of Chemicals

CAS = Chemical Abstract Service

EN = European norm

ISO = International Organization for Standardization

DIN = Deutsche Industrie Norm

PBT = Persistent Bioaccumulative and Toxic

vPvB = Very Persistent and very Bio-accumulative

LD = Lethal dose

LC = Lethal concentration

EC = Effect concentration

IC = Median immobilisation concentration or median inhibitory concentration

### **Relevant R phrases (number and full text)**

- |             |  |
|-------------|--|
| 11          | Highly flammable.  |
| 25          | Toxic if swallowed.  |
| 35          | Causes severe burns.   |
| 40          | Limited evidence of a carcinogenic effect.   |
| 43          | May cause sensitisation by skin contact.   |
| 48/23       | Toxic: danger of serious damage to health by prolonged exposure through inhalation.  |
| 48/23/24/25 | Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. |
| 52          | Harmful to aquatic organisms.  |
| 53          | May cause long-term adverse effects in the aquatic environment.  |

### **Relevant H and EUH statements (number and full text)**

- |      |  |
|------|--|
| 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.                               |
| H319 | Causes serious eye irritation.                                     |
| H351 | Suspected of causing cancer.                                       |
| H372 | Causes damage to organs through prolonged or repeated exposure.    |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H412 | Harmful to aquatic life with long lasting effects.                 |
| H413 | May cause long lasting harmful effects to aquatic life.            |

### **Further Information**

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product(s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. (n.a. =



not applicable; n.d. = not determined)

---

*(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)*