

Product information sheet

according to Regulation (EC) No 1907/2006 (REACH)



Trade name: Robert Bosch GmbH
Product No: 48V Battery System
Version: 1.0 / EN
Released: RBGA-2905260

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Revision date: 04.03.2019

1. Identification of the substance/mixture and of the company/undertaking

1.1. Reactivity

Commercial product name:
Automotive 48 V Battery System

Use of the substance/preparation:
Lithium-Ion Battery System

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

Use of the substance/mixture:
Not applicable, see chapter 16.3

1.3. Details of the supplier of the safety data sheet

Company name: Robert Bosch GmbH
Powertrain Solutions
Street: Kruppstr. 20
Place: D-70469 Stuttgart (Germany)
Telephone: +49(0)711 811-0
Contact Person: Michael Köhler

1.4. Emergency contact

GBK Gefahrgutbüro GmbH
Mail: gbk@gbk-ingelheim.de
Telephone: +1352323500 (except USA)
+18005355053 (USA)

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2. Hazards identification

2.1. Reactivity

Not applicable, see chapter 16.3

2.2. Label elements

Additional advice on labelling:

There is no hazard expected, when the instructions for handling and storage are followed.

2.3. Other hazards

In case of an accident (e.g. leakage of electrolyte):

Organic electrolyte causes skin and eye irritation and mucous membranes.

In case of cell damage, possible release of dangerous substances and flammable gas mixture.

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3. Composition/information on ingredients

3.1. Substances

The listed substances are directly extracted from the cell supplier, at the current status and due to IP specific regulation are no more specific data available.

| Common chemical name / General name | CAS number | NIOSH RTECS number | Concentration/ Concentration range (in mass) |
|--|-------------|-----------------------|---|
| Lithium Metal Oxide | None listed | None listed | 15-25% |
| Aluminum | 7429-90-5 | BD0330000 | 15-25% |
| Graphite | 7782-42-5 | FF5250100 | 5-15% |
| Copper | 7440-50-8 | GL5325000 | 10-20% |
| Organic electrolyte | None listed | None listed | 15-25% |
| Plastic/ inert material | None listed | None listed | 37-67% |

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4. First aid measures

The described actions in this chapter are only necessary if an accident.

General information:

For the cells in this battery system, chemical materials are stored in a hermetically sealed aluminum case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by misuse, the cell case will be breached at the extreme, hazardous materials may be released.

Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.

Following inhalation:

The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.

Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

Following skin contact:

The steam of the electrolyte stimulates the skin. The electrolyte skin contact causes a sore and the stimulation on the skin.

Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

Following eye contact:

The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and the stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained. Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

Following ingestion:

Drink plenty of water. Do not induce vomiting.

Seek medical attention immediately.

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5. *Firefighting measures*

5.1. Extinguishing media

Clear water

5.2. Special hazards arising from the substance or mixture

Acrid and harmful gas is emitted during fire.

Advice for fire-fighters

Wear self-contained breathing apparatus and protective suit.

5.3. Additional information

If possible, remove batteries from firefighting area. If heated above 125°C, batteries can explode/vent. Batteries are not flammable but internal organic material will burn if the batteries is incinerated.

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6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.
Avoid contact with skin, eyes and clothing.
Avoid breathing fume and gas.

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 send for disposal.
The spilled solids needs to be put into a container. The leaked place is to be wiped off with dry cloth.

6.4. Reference to other sections

Information for disposal see section 13.

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7. Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:

Avoid mechanical damage of the battery. Do not open or disassemble.
Follow the instructions.

Important advices for handling and transportation:

- Improper handling of the battery system can cause serious personal injury or death
- Never connect any electrical device to the battery system
- Never remove the battery system cover, or the service cover or take the battery system apart
- Never touch battery system poles with your finger, tools, jewellery, or any metal object
- Never dismount / disassemble any part of the battery
- Never puncture crush or dispose to fire
- Never immerse in water
- Never overheat → Keep away from open flames, hot surfaces and sources of ignition

Possible dangers in case of misuse or improper operation:

Danger to health caused by organic substances and acids that might be emitted in failure conditions
Environmental hazard from release substances, e.g. electrolyte
Check for visible damage such as cracks in the housing.

Safety Functions:

The battery system is considered as being in a safe state if the contactors are open (state of delivery for shipping and transport)

This means that no current can flow through the battery system and any potentially critical state is not worsened by further energy input to the battery system due to current flow.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in closed original container.
Store in a cool dry place.

Advice for room storage:

- Room must only be accessible to authorized persons.
- Room must be dry and ventilated.
- The battery system must only be transported by using appropriate lifting gear.
- Store the battery system on surfaces that provide electrical insulation.
- Electrostatic discharge must be avoided.
- Avoid temperatures above 65°C.

7.3. Specific end uses

No data available.

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8. Exposure controls/personal protection

8.1. Control parameters¹

Ventilation is required if there is leakage from the cell or battery.

| Common chemical name / General name | OSAH | ACGIH | |
|-------------------------------------|---|--|--------------------|
| | PEL-TWA | TLV-TWA | BEI |
| Lithium Metal Oxide | <i>None listed</i> | <i>None listed</i> | <i>None listed</i> |
| Aluminum | <i>15mg/m³ (as total dust) 5mg/m³ (respirable fraction)</i> | <i>10mg/m³ (as total dust)</i> | <i>None listed</i> |
| Graphite | <i>15mg/m³ (as total dust)</i> | <i>2mg/m³ (as inhalation coarse particulate)</i> | <i>None listed</i> |
| Copper | <i>1mg/m³ (as dust, mist) 0,1mg/m³ (as fume)</i> | <i>1mg/m³ (as dust, mist) 0,2mg/m³ (as fume)</i> | <i>None listed</i> |
| Organic electrolyte | <i>None listed</i> | <i>None listed</i> | <i>None listed</i> |

OSHA: Occupational Safety and Health Administration

PEL-TWA: Permissible Exposure Limit-Time Weighted Average concentration

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value-Time Weighted Average concentration

BEI: Biological Exposure Indices

8.2. Reactivity

Not applicable, see chapter 16.3

8.3. Exposure controls

Appropriate engineering controls:

For normal intended useage not necessary. Special ventilation is not required when using these products in normal use scenarios. Ventilation is required if there is leakage from the battery.

Personal protective equipment:

Under normal usage as intended by the manufacturer no special provision is necessary.

For leakage of electrolyte or other non-expected situation, use PPE as followed. In case of fire it shall always be considered to not inhale the fume or smoke.

Eye / Face protection: In case of leakage use appropriate goggles, tightly fitting goggles (EN166)

Skin protection: In case of leakage use appropriate nitrile gloves.

Respiratory protection: In case of leakage use appropriate face masks (EN149)

8.4. Environmental exposure controls:

Hygiene Measures:

Do not eat, drink or smoke in work areas. Avoid storing food near the product.

Environmental exposure controls:

Avoid release of electrolyte to the environmental.

¹ The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet

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9. Reactivity

9.1. Reactivity

Appearance:

| | |
|-----------------|----------|
| Physical state: | solid |
| Colour: | various |
| Odour: | odorless |

9.2. Other information

No data available.

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10. Stability and reactivity

10.1. Reactivity

Stable under normal use.

10.2. Chemical stability

Stable under normal use.

10.3. Possibility of hazardous reactions

Not expected under normal use. Electrolyte and electrodes may react with water or moisture.

10.4. Conditions to avoid:

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

Do not puncture, crush or incinerate.

Avoid temperatures above 65°C.

10.5. Incompatible materials:

Conductive materials, water, seawater, strong oxidizers and strong acids.

10.6. Hazardous decomposition products:

Acrid or harmful gas is emitted during fire.

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11. Toxicological information

Not applicable for the product, see chapter 16.3

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12. Ecological information

Not applicable for the product, see chapter 16.3

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13. Disposal considerations

13.1. Waste treatment methods

Disposal in accordance with local regulations.

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14. Transport information

14.1. Land transport (ADR/RID)

UN number: UN 3480

UN proper shipping name: Lithium-ion battery

Transport hazard class(es): 9

Packing group: -

Hazard label: 9A

Classification code: M4

Special Provisions: 188 230 310 348 376 377 636

Limited quantity: 0

Excepted quantity: E0

Transport category: 2

Tunnel restriction code: E

14.2. Marine transport (IMDG)

UN number: UN 3480

UN proper shipping name: Lithium-ion battery

Transport hazard class(es): 9

Packing group: -

Hazard label: 9A

Special Provisions: 188, 230, 310, 348, 376, 377

Limited quantity: 0

Excepted quantity: E0

EmS: F-A, S-I

14.3. Air transport (ICAO-TI/IATA-DGR)

UN number: UN 3480

UN proper shipping name: Lithium-ion battery

Transport hazard class(es): 9

Packing group: -

Hazard label: 9A

Limited quantity Passenger: Forbidden

Passenger LQ: Forbidden

Excepted quantity: E0

IATA-packing instructions - Passenger: Forbidden

IATA-max. quantity - Passenger: Forbidden

IATA-packing instructions - Cargo: See 965

IATA-max. quantity - Cargo: See 965

14.4. Environmental hazards

Not applicable for the product

14.5. Special precautions for user

No specific precautions required.

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15. Regulatory information

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

Additional information

Not applicable for the product, see chapter 16.3

Chemical safety assessment:

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

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16. Other information

16.1. Indication of changes

Not applicable.

16.2. Abbreviations and acronyms

ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
RID = Regulation concerning the International Carriage of Dangerous Goods by Rail (RID)
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
IBC-Code = International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
REACH = Registration, Evaluation, Authorization and Restriction of Chemicals
CAS = Chemical Abstract Service
EN = European norm

16.3. Further information

Important Information:

as written in the "REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL" from 18 December 2006 in Article 33:

„Duty to communicate information on substances in articles

- Any supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0,1 % weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.
- On request by a consumer any supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0,1 % weight by weight (w/w) shall provide the consumer with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.

The relevant information shall be provided, free of charge, within 45 days of receipt of the request.”