

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

Revision date: 6/30/2021

Supersedes: 10/11/2018

Version: 2.0

SDS No: 00377-0095



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

1.1. Product identifier

Product form : Article
Product name : Lithium-ion battery
Type of product : 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.
Further information : batteries Type: 12V20Wh; 12V24WH; 12V29Wh; 12V36Wh; 12V48Wh; 12V60Wh; 12V72Wh; 12V84Wh; 12V90Wh; 12V96Wh

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

1.2.1. Relevant identified uses

Use of the substance/mixture : batteries and accumulators

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Robert Bosch GmbH
Automotive Aftermarket
P.O. Box 41 09 60
76227 Karlsruhe
Germany
T +49 721-942-0
E-mail address of competent person responsible for the SDS: sds@gbk-ingelheim.de

1.4. Emergency telephone number

Emergency number : INTERNATIONAL: +49 - (0) 6132 - 84463, GBK GmbH (24h - 7d/w - 365d/a)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

| | |
|--|------|
| Acute toxicity (oral), Category 4 | H302 |
| Skin corrosion/irritation, Category 1, Sub-Category 1A | H314 |
| Serious eye damage/eye irritation, Category 1 | H318 |
| Specific target organ toxicity — Repeated exposure, Category 2 | H373 |

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

To our knowledge, this product does not present any particular risk, provided it is handled in accordance with good occupational hygiene and safety practice.

2.2. Label elements

As an article the product does not need to be labelled in accordance with EC-directives or respective national laws.
No labelling applicable

2.3. Other hazards

Other hazards not contributing to the classification : Undamaged, closed cells do not represent a danger to the health.

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



BOSCH

| Component | |
|-------------------------|--|
| Graphite(7782-42-5) | The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 |
| Polyethylene(9002-88-4) | The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 |

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Comments : batteries and accumulators

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|--|---|-------|--|
| Plastic container | - | < 30 | Not classified |
| Iron lithium phosphate | CAS-No.: 15365-14-7 EC-No.: 476-700-9 | < 20 | Not classified |
| copper | CAS-No.: 7440-50-8 EC-No.: 231-159-6 EC Index-No.: 029-024-00-X | < 15 | Not classified |
| Graphite | CAS-No.: 7782-42-5 EC-No.: 231-955-3 | < 10 | Not classified |
| Phosphate(1-),hexafluoro-,lithium(1:1) | CAS-No.: 21324-40-3 EC-No.: 244-334-7 | < 10 | Acute Tox. 3 (Oral), H301 (ATE=100 mg/kg bodyweight) Skin Corr. 1A, H314 STOT RE 1, H372 |
| Ethylene carbonate | CAS-No.: 96-49-1 EC-No.: 202-510-0 | < 10 | Acute Tox. 4 (Oral), H302 (ATE=500 mg/kg bodyweight) Eye Irrit. 2, H319 STOT RE 2, H373 |
| dimethyl carbonate | CAS-No.: 616-38-6 EC-No.: 210-478-4 EC Index-No.: 607-013-00-6 | < 10 | Flam. Liq. 2, H225 |
| Aluminium | CAS-No.: 7429-90-5 EC-No.: 231-072-3 | < 5 | Not classified |
| | CAS-No.: 9003-07-0 | < 5 | Not classified |
| Polyethylene | CAS-No.: 9002-88-4 EC-No.: 618-339-3 | < 5 | Not classified |
| Poly(vinylidene fluoride) (PVDF) | CAS-No.: 24937-79-9 | < 3 | Not classified |
| Sodium carboxymethyl cellulose | CAS-No.: 9004-32-4 EC-No.: 618-378-6 | < 0.5 | Not classified |

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|--------------------------------|--------------------|-------|---|
| Styrene Butadiene Rubber (SBR) | CAS-No.: 9003-55-8 | < 0.5 | Not classified |

Comments : 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
The terminals contain 60% copper (CAS No. 7740-50-8), 40% zinc (CAS No. 7740-66-6),
max. 0,5% lead(CAS-Nr. 7439-92-1) and max. 0,004% cadmium (CAS-Nr. 7440-43-9).

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : 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.

First-aid measures after inhalation : Move to fresh air. If symptoms persist, call a physician. Do not apply mouth-to-mouth resuscitation. Administer oxygen if breathing is difficult. Delayed fatal pulmonary oedema possible.

First-aid measures after skin contact : Immediately rinse with plenty of water (for at least 15 minutes). Get medical advice if skin irritation persists. Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

First-aid measures after eye contact : Wash immediately with plenty water (during 20 minutes), also under eyelids. Remove contact lenses, if present and easy to do. Continue rinsing. Consult an eye specialist.

First-aid measures after ingestion : Do not induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

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

Symptoms/effects : In case of electrolyte leakage: According to concentration, aqueous solution causes irritations or burns of eyes, skin and mucous membranes. May cause respiratory irritation. Cough. Respiratory difficulties.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : For a minor fire : Water. Carbon dioxide (CO₂). extinguishing powder. Sand. For a significant fire : Alcohol-resistant foam. Water spray.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : In case of fire: release of harmful/irritant gases/vapours. During contact of electrolyte with water hydrofluoric acid can be formed.

5.3. Advice for firefighters

Firefighting instructions : Approach from upwind. Do not allow run-off from fire fighting to enter drains or water courses.

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

Other information : If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Use personal protective clothing. Avoid contact with skin, eyes and clothing. In case of vapour formation use adequate respirator. Ensure adequate air ventilation.

6.1.1. For non-emergency personnel

Emergency procedures : Avoid breathing fume, gas.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Do not discharge into drains or the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : In case of electrolyte leakage: Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Collect all waste in suitable and labelled containers and dispose according to local legislation.

6.4. Reference to other sections

Refer to protective measures listed in sections 7 and 8. For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Keep away from open flames, hot surfaces and sources of ignition.
Precautions for safe handling : Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble. Obtain special instructions before use.
Hygiene measures : Always wash hands after handling the product. Wash contaminated clothing before reuse. Wash hands before breaks and at the end of workday. Avoid contact with skin and eyes. Contaminated work clothing should not be allowed out of the workplace. Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep containers tightly closed in a dry, well-ventilated place. Keep out of frost. Protect from moisture.
Heat and ignition sources : Keep away from heat and direct sunlight.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

| | |
|---|--|
| copper (7440-50-8) | |
| EU - Indicative Occupational Exposure Limit (IOEL) | |
| Local name | Copper |
| IOEL TWA | 0.01 mg/m ³ (respirable fraction) |
| Remark | (Year of adoption 2014) |

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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copper (7440-50-8)

Regulatory reference

SCOEL Recommendations

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

Additional information : During normal charging and discharging there is no release of product.

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:

In case of electrolyte leakage: Ensure adequate ventilation, especially in confined areas.

8.2.2. Personal protection equipment

Personal protective equipment:

In case of electrolyte leakage: Wear recommended personal protective equipment.

8.2.2.1. Eye and face protection

Eye protection:

In case of electrolyte leakage: Protective goggles (EN 166)

8.2.2.2. Skin protection

Skin and body protection:

In case of electrolyte leakage: Acid-resistant clothing

Hand protection:

In case of electrolyte leakage: Chemically resistant protective gloves

8.2.2.3. Respiratory protection

Respiratory protection:

In case of electrolyte leakage: Put on breathing apparatus

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Other information:

In case of electrolyte leakage: Avoid contact with skin, eyes and clothing. Do not breathe gas/fumes. Eliminate ignition sources.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|------------------|------------------|
| Physical state | : Solid |
| Colour | : Not available |
| Appearance | : batteries. |
| Odour | : odourless. |
| Odour threshold | : Not available |
| Melting point | : Not available |
| Freezing point | : Not available |
| Boiling point | : Not available |
| Flammability | : Not available |
| Explosive limits | : Not applicable |

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



BOSCH

| | |
|---|------------------|
| Lower explosive limit (LEL) | : Not applicable |
| Upper explosive limit (UEL) | : Not applicable |
| Flash point | : Not applicable |
| Auto-ignition temperature | : Not applicable |
| Decomposition temperature | : Not available |
| pH | : Not available |
| pH solution | : Not available |
| Viscosity, kinematic | : Not applicable |
| Solubility | : Not available |
| Partition coefficient n-octanol/water (Log Kow) | : Not available |
| Vapour pressure | : Not available |
| Vapour pressure at 50 °C | : Not available |
| Density | : Not available |
| Relative density | : Not applicable |
| Relative vapour density at 20 °C | : Not applicable |
| Particle size | : Not available |
| Particle size distribution | : Not available |
| Particle shape | : Not available |
| Particle aspect ratio | : Not available |
| Particle aggregation state | : Not available |
| Particle agglomeration state | : Not available |
| Particle specific surface area | : Not available |
| Particle dustiness | : Not available |

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use. Electrolyte and electrodes may react with water or moisture.

10.4. Conditions to avoid

Keep away from any flames or sparking source. Do not puncture, crush or incinerate. Air contact. Moisture. Overcharge. Incompatible substances or mixtures. heat. High temperature.

10.5. Incompatible materials

Strong oxidizing agent. Strong acids. Water.

10.6. Hazardous decomposition products

No decomposition if stored normally. Thermal decomposition generates : Carbon monoxide. Carbon dioxide. Toxic gases. Metal oxides.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral) : Harmful if swallowed.

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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| | |
|-----------------------------|---|
| Acute toxicity (dermal) | : Not classified |
| Acute toxicity (inhalation) | : Not classified |
| Additional information | : When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us |

| | |
|----------------------------|--------------------------|
| Lithium-ion battery | |
| ATE CLP (oral) | 1366.12 mg/kg bodyweight |

| | |
|--------------------|---------------------|
| (9003-07-0) | |
| LD50 oral rat | > 5000 mg/kg rat |
| LD50 dermal rabbit | > 2000 mg/kg Rabbit |

| | |
|-----------------------------------|---|
| Skin corrosion/irritation | : Causes severe skin burns. |
| Additional information | : In case of electrolyte leakage: According to concentration, aqueous solution causes irritations or burns of eyes, skin and mucous membranes |
| Serious eye damage/irritation | : Causes serious eye damage. |
| Respiratory or skin sensitisation | : Not classified |
| Additional information | : In case of electrolyte leakage: May cause sensitisation of susceptible persons by skin contact |
| Germ cell mutagenicity | : Not classified |
| Carcinogenicity | : Not classified |

| | |
|--------------------|----------------------|
| (9003-07-0) | |
| IARC group | 3 - Not classifiable |

| | |
|---------------------------------|----------------------|
| Polyethylene (9002-88-4) | |
| IARC group | 3 - Not classifiable |

| | |
|---|----------------------|
| Styrene Butadiene Rubber (SBR) (9003-55-8) | |
| IARC group | 3 - Not classifiable |

| | |
|------------------------|--|
| Reproductive toxicity | : Not classified |
| STOT-single exposure | : Not classified |
| STOT-repeated exposure | : May cause damage to organs through prolonged or repeated exposure. |

| | |
|-------------------------------------|--|
| Ethylene carbonate (96-49-1) | |
| STOT-repeated exposure | May cause damage to organs through prolonged or repeated exposure. |

| | |
|--|---|
| Phosphate(1-),hexafluoro-,lithium(1:1) (21324-40-3) | |
| STOT-repeated exposure | Causes damage to organs through prolonged or repeated exposure. |

| | |
|-------------------|------------------|
| Aspiration hazard | : Not classified |
|-------------------|------------------|

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

No additional information available

11.2.2. Other information

| | |
|---|---|
| Toxicokinetics, metabolism and distribution | : Undamaged, closed cells do not represent a danger to the health |
|---|---|

SECTION 12: Ecological information

12.1. Toxicity

| | |
|---|--|
| Ecology - general | : When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us. |
| Hazardous to the aquatic environment, short-term (acute) | : Not classified |
| Hazardous to the aquatic environment, long-term (chronic) | : Not classified |

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

(9003-07-0)

| | |
|---------------------------|---------------------|
| Bioaccumulative potential | not bioaccumulable. |
|---------------------------|---------------------|

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
European List of Waste (LoW) code : 16 06 05 - other batteries and accumulators

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

| ADR | IMDG | IATA | ADN | RID |
|---|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| 14.1. UN number or ID number | | | | |
| UN 3480 | UN 3480 | UN 3480 | UN 3480 | UN 3480 |
| 14.2. UN proper shipping name | | | | |
| LITHIUM ION BATTERIES | LITHIUM ION BATTERIES | Lithium ion batteries | LITHIUM ION BATTERIES | LITHIUM ION BATTERIES |
| Transport document description | | | | |
| UN 3480 LITHIUM ION BATTERIES, 9A, (E) | UN 3480 LITHIUM ION BATTERIES, 9 | UN 3480 Lithium ion batteries, 9 | UN 3480 LITHIUM ION BATTERIES, 9A | UN 3480 LITHIUM ION BATTERIES, 9A |
| 14.3. Transport hazard class(es) | | | | |
| 9A | 9 | 9 | 9A | 9A |
| | | | | |
| 14.4. Packing group | | | | |
| Not applicable | Not applicable | Not applicable | Not applicable | Not applicable |

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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| ADR | IMDG | IATA | ADN | RID |
|--|---|-----------------------------------|-----------------------------------|-----------------------------------|
| 14.5. Environmental hazards | | | | |
| Dangerous for the environment: No | Dangerous for the environment: No Marine pollutant: No | Dangerous for the environment: No | Dangerous for the environment: No | Dangerous for the environment: No |
| No supplementary information available | | | | |

14.6. Special precautions for user

Overland transport

Classification code (ADR) : M4
Special provisions (ADR) : 188, 230, 310, 348, 376, 377, 636
Limited quantities (ADR) : 0
Excepted quantities (ADR) : E0
Packing instructions (ADR) : P903, P908, P909, P910, LP903, LP904
Transport category (ADR) : 2
Tunnel restriction code (ADR) : E

Transport by sea

Special provisions (IMDG) : 188, 230, 310, 348, 376, 377, 384, 387
Limited quantities (IMDG) : 0
Excepted quantities (IMDG) : E0
Packing instructions (IMDG) : P903, P908, P909, P910, P911, LP903, LP904, LP905, LP906
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-I
Stowage category (IMDG) : A
Stowage and handling (IMDG) : SW19
MFAG-No : 147

Air transport

PCA Excepted quantities (IATA) : E0
PCA Limited quantities (IATA) : Forbidden
PCA limited quantity max net quantity (IATA) : Forbidden
PCA packing instructions (IATA) : Forbidden
PCA max net quantity (IATA) : Forbidden
CAO packing instructions (IATA) : See 965
CAO max net quantity (IATA) : See 965
Special provisions (IATA) : A88, A99, A154, A164, A183, A201, A206, A213, A331, A334, A802
ERG code (IATA) : 12FZ

Inland waterway transport

Classification code (ADN) : M4
Special provisions (ADN) : 188, 230, 310, 348, 376, 377, 387, 636
Limited quantities (ADN) : 0
Excepted quantities (ADN) : E0
Equipment required (ADN) : PP
Number of blue cones/lights (ADN) : 0

Rail transport

Classification code (RID) : M4
Special provisions (RID) : 188, 230, 310, 348, 376, 377, 387, 636
Limited quantities (RID) : 0
Excepted quantities (RID) : E0
Packing instructions (RID) : P903, 908, 909, P910, P911, LP903, LP904, LP905, LP906
Transport category (RID) : 2
Hazard identification number (RID) : 90

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

Lithium-ion battery

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
SDS No: 00377-0095



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SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Contains no substance on the REACH candidate list

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

Contains no substance subject to Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors.

15.1.2. National regulations

Listed on the Canadian DSL (Domestic Substances List)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on the Canadian NDSL (Non-Domestic Substances List)

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Full text of H- and EUH-statements:

| | |
|---------------------|--|
| Acute Tox. 3 (Oral) | Acute toxicity (oral), Category 3 |
| Acute Tox. 4 (Oral) | Acute toxicity (oral), Category 4 |
| Eye Dam. 1 | Serious eye damage/eye irritation, Category 1 |
| Eye Irrit. 2 | Serious eye damage/eye irritation, Category 2 |
| Flam. Liq. 2 | Flammable liquids, Category 2 |
| H225 | Highly flammable liquid and vapour. |
| H301 | Toxic if swallowed. |
| H302 | Harmful if swallowed. |
| H314 | Causes severe skin burns and eye damage. |
| H318 | Causes serious eye damage. |
| H319 | Causes serious eye irritation. |
| H372 | Causes damage to organs through prolonged or repeated exposure. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| Skin Corr. 1A | Skin corrosion/irritation, Category 1, Sub-Category 1A |
| STOT RE 1 | Specific target organ toxicity — Repeated exposure, Category 1 |
| STOT RE 2 | Specific target organ toxicity — Repeated exposure, Category 2 |

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

| | | |
|---------------------|------|--------------------|
| Acute Tox. 4 (Oral) | H302 | Calculation method |
| Skin Corr. 1A | H314 | Calculation method |
| Eye Dam. 1 | H318 | Calculation method |
| STOT RE 2 | H373 | Calculation method |

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should therefore not be construed as guaranteeing any specific property of the product.