

SECTION 1: Identification of the article and of the company/undertaking

1.1. Product identifier

Product form	: Article
Description	: Lithium ion battery

1.2. Details of the supplier of the safety data sheet

Alfred Kärcher SE & Co. KG
 Alfred-Kärcher-Str. 28-40
 D-71364 Winnenden
 GERMANY

SECTION 2: Hazards identification and Safety Precautions

General Remarks

- Within the battery, more precisely within the cells, chemical materials are enclosed in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures occurring during normal use. As a result, during normal use, there is neither a physical danger of ignition or explosion nor a chemical danger due to leakage of hazardous materials.

Classification according to GHS

- There is no requirement for classification according to GHS for Lithium ion rechargeable cells or batteries since they are considered as articles.

Description of possible hazards

- If the battery is exposed to a fire, to increased mechanical shocks, to increased electric stress by misuse or is damaged, the gas release vent will be opened. The cell or battery case will be breached in the worst case and hazardous materials may be released.
- If the battery is heated strongly (e.g. by fire), acrid gas may be emitted.
- When damaged cells or batteries are exposed to water, the formation of explosive gases (hydrogen) is possible.
- In general, contact with substances of leaking cells or batteries can pose a danger to personal health and the environment. For this reason, when coming into contact with cells or batteries with a conspicuous appearance (leaking substances, deformed, discoloured, dented or the like), sufficient body and breathing protection is required.
- Lithium cells or batteries can react very severely in combination with fire. This can result in ejection of components from the cells or batteries with considerable force.
- Lithium cells or batteries can still represent a source of danger even when thought to be discharged, since they can deliver a very high short-circuit current.

Precautionary statements - Prevention

- When recharging cells or batteries, never use chargers which are unsuitable for the cell/battery type.
- Use the charging process tailored to the respective cell type of a rechargeable battery.
- Avoid deep-discharging of the cells/batteries.
- Do not use deep-discharged cells/batteries again.
- Do not short-circuit cells/batteries.
- Do not inflict mechanical damage (puncturing, deforming, disassembling etc.).
- Do not heat them above the permitted temperature or burn them.
- Keep cells/batteries away from small children.
- Avoid excessive charging voltages and overcharging.
- Observe cells or batteries regularly for unusual warming, odour, discolouration or deformation during charging, use and storage.

Precautionary statements - Storage

- Always store cells or batteries in a dry and cool place.

SECTION 3: Composition/information on ingredients

Lithium ion battery consisting of various metals, metal salts, polymers and electrolytes in varying concentration ranges.

SECTION 4: First aid measures

4.1. Description of first aid measures

General measures: Move the affected person away from the contaminated area. Fresh air, rest. Prevent cooling by covering the victim (no warming up). If unconscious, place in recovery position and seek medical advice. Do not give an unconscious person anything to drink. Remove soiled clothing promptly.

Eye contact: Wash with plenty of water (during 20 minutes minimum) with eyes wide open after taking off soft contact lenses (if possible) and immediately take medical advice.

Skin contact: Immediately remove contaminated clothing or footwear. Rinse and then wash skin thoroughly with water and soap. If skin irritation or rash occurs: Get medical advice/attention.

Respiratory tract: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Artificial respiration if indicated. If symptoms persist, call a physician.

Ingestion: Rinse out the mouth and around the mouth with water. Do not induce vomiting. Immediately call for the help of a doctor.

4.2. Most important symptoms and effects

In the event that a cell or battery is damaged, the electrolyte solution contained within the cell or battery might leak out and cause corrosion of affected tissues.

After inhalation of cell ingredients: irritation of respiratory tract by volatile gases possible. Anaphylactic reactions possible in severe cases.

After ingestion of cells or cell ingredients: Swallowing cells – if damaged or not – might cause damage to the respiratory tract and cause chemical burns of the stomach. Danger of asphyxiation.

After skin contact of cell ingredients: Allergic skin reactions or chemical burns may occur.

After eye contact of cell ingredients: Chemical burns of the eye tissue may occur.

SECTION 5: Firefighting measures

5.1. Extinguishing media

For Lithium ion rechargeable cells or batteries, powder is the extinguishing media of choice.

Especially for cells or batteries contained in equipment, plenty of water (cooling effect), gaseous carbon dioxide, gaseous nitrogen and foam are suitable, too.

If cells or batteries are burning together with other combustible materials simultaneously, take fire-extinguishing media which are suitable for these materials.

5.2. Special hazards arising from the article

Corrosive gases may be emitted during fire. Explosive gases (hydrogen) may be emitted when using aqueous mixtures as extinguishing media. Hydrogen fluoride may be emitted from cells or batteries that contain fluoride compounds.

5.3. Advice for firefighters

Evacuate the danger area. Keep public away from danger area. Take care of wind direction. Extra personal protection: complete protective clothing including self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate the danger area. Remove sources of ignition. Avoid contact with skin, eyes and clothing. Avoid breathing fume and gas. Use personal safety equipment appropriate for the situation (safety gloves, protective clothing, safety mask, breathing protection).

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Seal leaking cells or batteries in an airtight plastic bag, having added dry sand, chalk powder (CaCO_3) or vermiculite. Traces of electrolyte can be soaked up with dry paper towels.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Use the battery only for the recommended equipment.
- When recharging batteries, use the recommended charging equipment only.
- Never use chargers which are unsuitable for the battery type.
- Use the charging process tailored to the respective cell type of a rechargeable battery.
- Avoid excessive charging voltages and overcharging.
- Avoid deep-discharging of the cells/batteries.
- Do not use deep-discharged cells/batteries again.
- Do not short-circuit cells/batteries.
- Avoid polarity reverse connection when installing the battery to equipment.
- Do not damage or remove the cell cover.
- Do not inflict mechanical damage (puncturing, deforming, disassembling etc.).
- Do not heat cells or batteries above the permitted temperature or burn them.
- Do not disassemble or reconstruct the cell or battery. Do not solder directly on the cell or battery.

7.2. Conditions for safe storage, including any incompatibilities

- Always store batteries in a dry and cool place.
- Avoid heat and direct sunlight.
- Avoid exposure to static electricity / static discharges.
- Do not expose cells or batteries to water, acids, bases or oxidizing agents.

- Recommended storage conditions:
temperature: -20 °C to +35 °C
humidity: 45% to 85%
- Do not store together with metals or other conductive materials.
- Check the requirement of a permission by the authorities when storing large amounts of cells.

SECTION 8: Personal protection

Personal protection equipment is not required when handling undamaged cells or batteries under normal conditions. Wear appropriate personal protection equipment when handling damaged or leaking cells or batteries.

General remarks: Do not eat, drink or smoke in the work area. Do not touch the spilled material from leaking cells or batteries. Avoid inhalation of fumes and gases.

Appropriate engineering controls: Ensure good ventilation when handling damaged or leaking cells or batteries.

Materials for protective clothing: Wear proper protective equipment when handling damaged or leaking cells or batteries.

Hand protection: Chemically resistant protective gloves (Butyl or nitril rubber for example) when handling damaged or leaking cells or batteries.

Eye protection: Wear appropriate safety glasses when handling damaged or leaking cells or batteries.

Respiratory protection: Be aware of release of acrid or explosive gases when handling damaged or leaking cells or batteries. Hydrogen fluoride may be emitted from cells that contain fluoride compounds. Appropriate self-contained breathing apparatus may be required.

SECTION 9: Physical and chemical properties**Appearance**

Physical state : Solid

SECTION 10: Stability and reactivity**Reactivity**

During normal use, there is neither a physical danger of ignition or explosion nor a chemical danger due to leakage of hazardous materials. However, Lithium ion rechargeable cell or batteries can react very severely in combination with fire.

Possibility of hazardous reactions

When damaged cells or batteries are exposed to water, the formation of explosive gases (hydrogen) is possible. Damaged cells or batteries may release corrosive substances.

Conditions to avoid

Fire, heat, direct sunlight, increased mechanical shocks, increased electric stress, unauthorized charging procedures, deep-discharging, short-circuiting of cells, excessive charging voltages and overcharging, mechanical damage (puncturing, deforming, disassembling etc.)

Incompatible materials

Water, acids or oxidizing agents, metals and other conductive materials

Hazardous decomposition products

If cells or batteries are damaged, acrid gas may be emitted. When damaged cells or batteries are exposed to water, the formation of explosive gases (hydrogen) is possible. Hydrogen fluoride may be emitted from cells or batteries that contain fluoride compounds. Other possible decomposition products: carbon monoxide and carbon dioxide, lithium hydroxide, metal oxides

SECTION 11: Toxicological information

Leaking cells or batteries might release substances that can cause irritation or corrosion of affected tissues (eyes, skin, respiratory tract, gastrointestinal tract - if ingested).

SECTION 12: Ecological information

Leaking cells or batteries might release substances that can be dangerous to the environment, for example salts of heavy metals (Co, Ni, Mn).

SECTION 13: Disposal considerations

Specified collection or disposal of lithium ion rechargeable cells or batteries is required in several nations via dedicated legislations ("battery control law"). For example, in the EU, the directive 2006/66/EG is applicable. In nations where such a regulation is implemented, normally the importer or manufacturer of the cells or batteries is responsible for the collection and recycling of the cells/batteries.

Discarded cells or batteries may cause fire: Tape the cell contacts to insulate them.

SECTION 14: Transport information**UN number**

UN-No. (ADR / IMDG / IATA) : UN 3480

UN proper shipping name

Proper Shipping Name (ADR / IMDG / IATA) : Lithium ion batteries

Transport hazard class(es)

Transport hazard class(es) (ADR / IMDG / IATA) : 9

Packing group

Packing group (ADR / IMDG / IATA) : Not applicable

Environmental hazards

Dangerous for the environment : No
Marine pollutant : No

Special precautions for user**- ADR**

Tunnel restriction code (ADR) : E

- IMDG

Stowage category (IMDG) : A

Segregation group (IMDG) : Not applicable

- Special provisions

SP188 For ≤ 100 Wh (battery) / ≤ 20 Wh (cell) the special provision 188 ADR / RID / ADN / IMDG can be applied.

SECTION 15: Regulatory information**EU legislation**

Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators

SECTION 16: Other information

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.

The state of knowledge was considered up to the date mentioned within this safety data sheet, a periodical updating process is not scheduled.