

## Safety information

Robert Bosch Power Tools GmbH

Revision: 05.12. 2016

Rev. no.: 6.0

**Lithium-ion rechargeable battery (battery pack and products with lithium-ion cells)**

00635-Lilonen



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## **1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY**

### **Trade name**

Lithium-ion rechargeable battery (battery pack and products with lithium-ion cells)

### **Manufacturer/Supplier information**

Company: Robert Bosch Power Tools GmbH  
PT/EEI  
Place: 70538 Stuttgart / GERMANY  
Internet: www.bosch-pt.com  
Responsible for the safety data sheet: sds@gbk-ingelheim.de

Emergency information                      INTERNATIONAL: +49 - (0) 6132 - 84463, GBK GmbH (24h - 7d/w - 365d/a)  
England and Wales: NHS Direct - 0845 4647; Scotland: NHS 24 - 08454 24 24

## **2. HAZARDS IDENTIFICATION**

Lithium ion batteries have a gas-tight seal and are safe as long as they are used and handled in accordance with the manufacturer's specifications.

### **Handling and Operational Safety**

#### **Handle discharged batteries carefully**

Batteries still represent a source of danger as they may deliver a very high short-circuit current. Even if assumed to be discharged, lithium ion batteries may - as other batteries- never totally discharge.

#### **Avoid impact to the battery**

Impact and penetration may damage the battery. This may cause the battery to leak, generate heat, smoke, catch fire, or explode.

#### **Keep batteries away from other metal objects**

like paperclips, coins, keys, nails, screws or other small metal objects that can make a connection from one terminal to another. Shorting the battery terminals together may cause burns or a fire.

#### **Under abusive conditions, liquid may be ejected from the battery**

Avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.

#### **Do not expose a battery to fire or excessive temperature**

Exposure to fire or temperature above 130 °C may cause explosion.

#### **Do not disassemble the battery**

Disassembly or modification of the battery may damage the protection circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

#### **Do not immerse the battery in liquid such as water, beverages, or other fluids**

Exposure to liquid may damage the battery. As a result, the battery may generate heat, smoke, catch fire, or explode.

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### **Recharge batteries only with the charger specified by the manufacturer**

A charger that is suitable for one type of batteries may create a risk of fire when used with another battery.

### **Use batteries only with specifically designated tools**

Use of any other tools may create a risk of injury and fire.

### **Do not use a battery that is damaged or modified**

Damaged or modified batteries may exhibit unpredictable behavior resulting in fire, explosion or risk of injury.

### **Do not use abnormal batteries**

Immediately stop using the battery if there are noticeable abnormalities, such as smell, heat, discoloration, or deformity. The battery may be defective and could generate heat, smoke, catch fire, or explode with continued use..

Excessively high charging voltages and overcharge must be avoided at all costs. They cannot only lead directly to critical situations, but also have a negative effect on the battery's life.

## **3. COMPOSITION / INFORMATION ON INGREDIENTS**

### **Characterizations**

The battery pack contains cells with lithium metal oxide cathode.

### **Important note**

The battery may not be opened, heated up to temperatures above 120°C or burned, as exposure to its contents can be dangerous under certain conditions. The product contains neither metallic lithium nor lithium alloys.

<b>Composition:</b>	Lithium metal oxide in the form of $\text{LiMO}_2$ (M=Co, Ni, Mn, Al), blends of the metals are possible
<b>Cathode:</b>	Lithium metal phosphate in the form of $\text{LiMPO}_4$ (M=Fe, Y, Co, Mn) Lithium manganese spinel in the form of $\text{LiMn}_2\text{O}_4$ Polyvinylidene fluoride (binder) Graphite (conductive material)
<b>Anode:</b>	Carbon (active material) Polyvinylidene fluoride (binder)
<b>Electrolyte:</b>	Organic solvents (non aqueous liquids) Lithium salt

The product does not contain metallic lithium or lithium alloys.

## **4. FIRST AID MEASURES**

### **Eye contact:**

Rinse eyes with water for 15 minutes and seek medical attention.

### **Skin contact:**

Wash area thoroughly with soap and water and seek medical attention.

### **Burns:**

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If burns are caused, treat them accordingly and seek medical attention.

### **Respiratory tract:**

In case of intensive smoke generation and gas release or bad smell leave the room and initiate an alarm and fire fighting action, if required. Seek medical attention if there are large quantities and irritation of the airways. Ensure sufficient ventilation.

### **Swallowing:**

Rinse out the mouth and around the mouth with water. Immediately seek medical attention

## **5. FIREFIGHTING MEASURES**

Fires from lithium batteries in use can in principle be fought with water. No additional or special extinguishing agents need be used, since the batteries are protected accordingly. Fire surrounding the batteries is to be fought with conventional extinguishing agents. The fire of a battery cannot be considered separately from the surrounding fire.

The cooling effect of water effectively impedes fire from spreading to battery cells which still have not reached the critical ignition temperature ("thermal runaway").

The fire load can be reduced by separating high quantities and by transport out of the dangerous zone.

As with any fire, the gases produced can be a health hazard if inhaled. For this reason, sufficient ventilation should be ensured.

## **6. ACCIDENTAL RELEASE MEASURES**

If the battery housing gets damaged, electrolyte can leak out. Seal batteries in an airtight plastic bag, add dry sand, chalk powder ( $\text{CaCO}_3$ ) or vermiculite. Traces of electrolyte can be soaked up with dry paper towels. When doing so, prevent direct contact with skin by wearing safety gloves. Thoroughly rinse with water.

Use personal safety equipment appropriate for the situation (safety gloves, protective clothing, safety mask, breathing protection).

## **7. HANDLING AND STORAGE**

### **Handling**

No special protective clothing required for handling individual batteries.

### **Storage**

In each case, carefully observe the warnings on batteries and the operating instructions. Use only the recommended battery types.

Lithium batteries must be stored at regular temperatures and in a dry location (max. 50°C); large temperature fluctuations are to be avoided. (For example, do not store close to heating elements, do not expose to sunshine for long periods).

When storing large quantities of lithium batteries, consult local authorities and insurers.

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## **8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

Lithium ion batteries are products, from which no substance is released under normal and reasonably foreseeable conditions of use.

## **9. PHYSICAL AND CHEMICAL PROPERTIES**

Compact batteries with (plastic) housing, terminals

## **10. STABILITY AND REACTIVITY**

If an upper temperature limit of (e.g. 130°C) is exceeded, the batteries are in danger of bursting.

When storing the battery above a temperature (e.g. 60°C), the battery may age faster and may lose its function early..

## **11. TOXICOLOGICAL INFORMATION**

When handled appropriate, and when general hygiene and safety regulations are followed, there are not known any injuries. If batteries are opened through misuses or damage, discard immediately. Internal components of cell are irritants and sensitizers or maybe toxic.

## **12. ECOLOGICAL INFORMATION**

When handled appropriate, there are not expected any negative impacts to the environment.

## **13. DISPOSAL CONSIDERATIONS**

Lithium batteries are marked with the symbol of the crossed-out wheeled bin (see figure).



The symbol reminds the end user that batteries in the EU are not permitted to be disposed of with household waste, but must be collected separately. Spent batteries have to be returned free of charge to collection schemes or distributors.

To prevent short circuits and associated heating, lithium batteries must not be stored or transported in bulk form and unprotected. Suitable measures against short circuits include:

- Placing the batteries in original packaging or a plastic bag

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- Masking the contacts
- Embedding in dry sand

## 14. TRANSPORT INFORMATION

Commercial transport of lithium ion batteries is subject to dangerous goods regulations. Transport preparations and transport are exclusively to be carried out by appropriately trained personnel and/or the process has to be accompanied by experts with suitable knowledge or qualified companies.

### Transport regulations:

Lithium batteries are subject to the following dangerous goods regulations and exemptions based on the respective valid revision:

Class 9

UN 3480: LITHIUM ION BATTERIES

UN 3481: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT,  
(i.e. inserted in battery operated product) or

LITHIUM ION BATTERIES PACKED WITH EQUIPMENT  
(i.e. packed together with battery operated product)

### ADR, RID

Special provisions: 188, 230, 310, 376, 377, 636

Packing instructions: P903, P908, P909, LP903, LP904

Tunnel category E

### IMDG Code

Special provisions: 188, 230, 310, 348, 360, 376, 377

Packing instructions: P903, P908, P909, LP903, LP904

EmS: F-A, S-I

Stowage category A

### ICAO, IATA-DGR

Special provisions: A88, A99, A154, A164, A181, A182, A183, A185, A201

Packing instructions: 965, 966, 967

### All transport modes

[Test methods and requirements

In accordance with the dangerous goods regulations for lithium batteries, each new type of cell or battery must have passed all tests listed in the UN Manual of Tests and Criteria, Part III, Section 38.3. This particularly applies also if multiple cells or batteries have been assembled into new batteries (battery packs or battery assemblies). Therefore it should be confirmed here that batteries as distributed by the manufacturer/supplier have passed the respective tests.

These requirements also apply to used batteries. Used batteries that are intact and undamaged can usually be transported under the regulations for unused batteries]

Defective or damaged batteries are subject to more stringent regulations. These regulations may prohibit the transport completely. A general ban applies to air transport (IATA DGR - special provision A154).

For transport of used - but not damaged - batteries please refer to the respective special provisions.

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Waste batteries and batteries which are sent for recycling or disposal are prohibited from air transport (IATA Special provision A 183).

Exemptions need to be approved in advance by the competent authority of the country of origin and the respective country of the airline.

## 15. REGULATORY INFORMATION

Regardless of shape, volume, weight and application, batteries, in the EU are subject to the respective national implementation of the European Battery Directive (2006/66/EC). It includes but is not limited to regulations regarding placing on the market, collection, treatment and recycling of batteries.

Transport regulations are according to IATA, ADR, IMDG, RID. Refer to section 14.

## 16. OTHER INFORMATION

The instructions provide help for complying with legal specifications, but do not replace them.

The foregoing information was compiled to the best of our knowledge and belief.

We cannot accept, however, responsibility for any error or omission, nor for any consequential loss or damage so arising.

The instruction does not represent any guarantee of properties. Distributors and users of the product have their own responsibility for observing applicable laws and regulations. Distributors and users of the product are responsible for complying with applicable laws and stipulations.

### Legal Remark

#### EC

These batteries are no "substances" or "preparations" according to Regulation 1907/2006 EC. Instead they have to be regarded as "articles", no substances are intended to be released during handling. Therefore there is no obligation to supply a MSDS according to Regulation (EC) 1907/2006, Article 31.

#### US

Material Safety Data Sheets (MSDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle;

- (i) which is formed to a specific shape or design during manufacture;
- (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and
- (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard.