Safety information
Robert Bosch GmbH
Revision: 09 March 2016 Rev. no.: 6.0
Lithium ion rechargeable battery (battery pack with lithium ion cells)
00635-LIA

1. IDENTIFICATION OF THE PRODUCT AND OF THE COMPANY

Trade name

Lithium ion rechargeable battery (battery pack with lithium ion cells)

Manufacturer/Supplier information

Robert Bosch GmbH
Power Tools
Max-Lang-Str. 40-46
D-70771 Leinfelden-Echterdingen

Contact:
Telephone:

Emergency information
GBK Gefahrgut Büro GmbH
E-mail: gbk@gbk-ingelheim.de
24-hour telephone number **(001) 352-323-3500**

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.

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.

Composition	Lithium metal oxide in the form of LiMO2 (M=Co, Ni, Mn, Al), blends of the metals are possible
Cathode:	Lithium metal phosphate in the form of LiMPO4 (M=Fe, Y, Co, Mn)
	Lithium manganese spinel in the form of LiMn2O4
	Polyvinylidene fluoride (binder)
	Graphite (conductive material)
Anode:	Carbon (active material)
	Polyvinylidene fluoride (binder)
Electrolytes:	Organic solvent (non-aqueous liquid)
	Lithium salt

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:

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 ($CaCO_3$) 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.

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

• 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 persons and/or the process has to be accompanied by corresponding experts or qualified companies.

Transport regulations:
Lithium batteries are subject to the following dangerous goods regulations and exceptions to them—in the version applicable in each case:

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)

Class 9

ADR, RID
Special provisions: SP188, SP230, SP376, SP377, SP636 (b)
Packing instructions: P903, P908, P909
Transport category II, Tunnel category (E)

IMDG Code
Special provisions: SP188, SP230, SP376, SP377, SP636b
Packing instructions: P903, P908, P909
EmS: F-A, S-I
Stowage category A

ICAO, IATA-DGR
Special provisions: A88, A99, A154, A164, A183
Section IA, IB or II
Packing instructions: PI965, PI966, PI967

All
Defective or damaged batteries are subject to more stringent regulations. This regulations may prohibit the transport completely. The prohibition of transport applies to air transport (ICAO T.I., IATA DGR - special provision A154).

However, for the transport of used - but not damaged - batteries, refer also to the corresponding special regulations.

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

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

15. REGULATORY INFORMATION

Transportation regulations according to IATA, ADR, IMDG, RID
In EU countries, the national laws for implementing directive 2006/66/EC (battery guideline) apply.

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.