SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE SUPPLIER

Product Name: Lithium ion rechargeable battery

Product Description: Battery pack with lithium ion cells

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Manufacturer/Distributor:
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SECTION 2: HAZARDS IDENTIFICATION

Classification (GHS-US)

Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200]: this mixture is not considered a hazard when used in a manner which is consistent with the labeled directions.

GHS-US Labeling

No labeling is applicable since this product is considered an article under the OSHA Hazard communication Standard [29 CFR 1910.1200]. See section 2.3 for hazards related to the ingredients encased within this product.

Other Hazards

Other hazards not contributing to the classification (These represent the hazards associated with the materials encased within the product that are not available under normal conditions of use)
H317 - May cause an allergic skin reaction
H351 - Suspected of causing cancer

Warning

SECTION 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 battery contains neither metallic lithium nor lithium alloys.

Composition

Cathode:	Lithium metal oxide (active material)
	Polyvinylidene fluoride (binder)

	Graphite (conductive material)
Anode:	Carbon (active material)
	Polyvinylidene fluoride (binder)
Electrolytes:	Organic solvent (non-aqueous liquid)
	Lithium salt

SECTION 4: FIRST AID MEASURES

The first-aid instructions given below refer exclusively to handling when contents are emitted.

Skin or eye contact:
If contact occurs, the affected areas must be thoroughly rinsed with water for at least 15 minutes. If there is eye contact, a doctor must be called in addition to a thorough rinsing with water.

Burns:
Burns must be correspondingly treated. It is also strongly recommended to call the doctor.

Airways:
If a lot of smoke is produced or gas is released, leave the room immediately. If quantities are larger and the airways are irritated, seek medical attention. Ensure good ventilation if possible.

Swallowing:
Rinse off the mouth and surroundings. Seek medical attention at once.

SECTION 5: FIREFIGHTING MEASURES

In principle, fires caused by lithium batteries can be extinguished with water.

No additional or special fire extinguishers are needed. Surrounding battery fires are put out with conventional fire extinguishers. A burning battery cannot be considered separately from the surrounding fire.

The cooling effect of water effectively inhibits the spread of a fire to the battery cells that have not yet reached the temperature critical for an ignition ("thermal runaway”).

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

SECTION 6: ACCIDENTAL RELEASE MEASURES

Electrolytes can leak out if the battery housing is damaged. Batteries must be placed inside an airtight plastic bag and dry sand, chalk powder ($CaCO_3$) or vermiculite added if possible. Electrolyte traces can be absorbed with dry household paper, but protective gloves should be worn to avoid direct skin contact. The area should be subsequently rinsed with plenty of water.

Personal protection equipment adapted to the situation should be worn (protective gloves, facial protection, respiratory protection).

SECTION 7: HANDLING AND STORAGE

Battery packs should be preferably stored in a dry place at room temperature (max. 60 °C). Large temperature fluctuations should be avoided (e.g. do not store near heaters, do not expose to direct sunlight for long periods).

Protect from humidity and water.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Battery packs are products from which no substances are released under normal and reasonably predictable conditions of use.
If handled properly, no personal protection equipment is necessary.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Compact battery pack with plastic sheathing.

SECTION 10: STABILITY AND REACTIVITY

When the temperature of 120°C is exceeded, there is the risk of the batteries bursting and possibly burning ("thermal runaway"). When a storage temperature of 60°C is exceeded, the batteries may age faster and lose their function prematurely.

SECTION 11: TOXICOLOGICAL INFORMATION

No danger if the batteries are used properly under normal conditions. If damaged or used improperly, irritating or sensitizing components can leak out.

SECTION 12: ECOLOGICAL INFORMATION

Negative ecological effects are not expected with proper use and disposal.

SECTION 13: DISPOSAL CONSIDERATIONS

Batteries may not be disposed of in household waste; they must be collected separately from the remaining waste.

Used batteries must be returned to the place of purchase or to an industrial or retail disposal system. When collecting or storing, avoid short circuits. To prevent short circuits and the associated heating up, battery packs may never be stored or transported unprotected in loose bulk. Some appropriate measures for preventing short circuits are:

- Putting batteries in their original packaging or in a plastic bag
- Masking over the poles
- Embedding in dry sand

Whenever possible, battery packs should be disposed of in a discharged state.

SECTION 14: TRANSPORT INFORMATION

The transport and storage temperature may not exceed 60°C

Important information!
The commercial transport of lithium batteries is subject to hazardous materials legislation. Both transport preparations and transport must be carried out by appropriately trained staff or the process must be accompanied by the corresponding experts or qualified companies.

Exception: For battery packs with a maximum energy content of 100 Wh, simplified special regulations of the hazardous materials legislation can be applied (ADR, RID: SV 188; IMDG: SP 188; IATA: PI 965, 966, 967, in each case Section II).

(The energy content of battery packs in Wh is indicated on the nameplate of the battery pack.)

Transport regulations:
Lithium batteries are subject to the following hazardous materials regulations and exceptions there from– in the currently valid version: Class 9

- UN 3480: LITHIUM ION BATTERIES
- UN 3481: LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (inserted or incorporated in the device) or LITHIUM ION BATTERIES PACKAGED WITH EQUIPMENT (e.g. enclosed in the carrying case)

Packaging group: II, tunnel category E

Special and special packaging regulations: ADR, RID: 188, 230, 310, 636, P903, P903a, P903b

Note: For ADR, see:
http://www.unece.org/trans/danger/publi/adr/adr2011/11contentse.html

IATA: A88, A99, A154, A164, P965, P966, P967, P968, P969, P970

Note: For the IATA Guidance Document about lithium batteries see:
www.iata.org/whatwedo/cargo/dgr/Documents/Lithium-Battery-Guidance-2013-V1.1.pdf

IMDG code: 188, 230, 310, P903

EmS: F-A, S-I

Stowage category A

Defective or damaged batteries are subject to stricter regulations that can include a full transport ban. The transport ban applies to air traffic carriers (ICAO T.I., IATA DGR – special provision A154).

For the transport of used but undamaged batteries, reference is also made to the corresponding special regulations (636) and packaging instructions (P903a and P903b / ADR).

Waste batteries and batteries sent for recycling or disposal are prohibited in air traffic (IATAspecial provision A 183).

Exceptions must be granted by the national authority in charge in the country of departure.

SECTION 15: REGULATORY INFORMATION

In EU countries, the national laws for implementing directive 2006/66/EC (battery guideline) apply.

SECTION 16: OTHER INFORMATION

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It shall be the responsibility of the customer purchasing this product to ensure that all employees/users of this product are familiar with and trained in the handling, use and hazards associated with this product as contained herein. This responsibility shall also extend directly to the user.