

## SAFETYINSTRUCTIONS and HANDLING PROCEDURE –Draft Version

# *Lithium ion and Polymer Rechargeable Batteries – Recommendations*

The battery contains flammable materials such as organic solvents. Mishandling the battery may cause fire, smoke, or an explosion and the battery's functionality will be seriously damaged. The battery is sealed hermetically. Thus, the ingredients have no hazard potential, except the battery is violated or dismantled.

The following notes should be put in an appropriate and effective location in each end-use product and its instruction manual.

### *Disclaimer*

The instructions (draft version) provide help for complying with legal or normative 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 or norms.

## Safety Notes



**Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

**Save all safety warnings and instructions for future reference.**

### *Safety Instructions*

#### *Handling and operational safety:*

Lithium-ion-batteries are always to be handled in accordance with the manufacturer's specifications. This is particularly true when complying with mechanical and thermal loads. Usually batteries are marketed together with appropriate battery chargers as product packages. Such products are not to be modified or tampered with, since that could result in substantial safety hazards.

Even if assumed to be discharged, Lithium-ion-batteries may - as other batteries - still represent a source of danger. They may deliver a very high short-circuit current.

## **DANGER**

### (1) Immersion

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

Exposure to liquid may damage the battery or the battery pack (including protection circuit). As a result, the battery may generate heat, smoke, catch fire, or explode.

### (2) High Temperature

*Does not use or place the battery near an open flame, heater or high temperature (above 60°C).*

Subjecting the battery to high temperature may damage a polyolefin separator and can cause an internal short circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

### (3) Chargers and Charge Conditions

*Do not use unauthorized chargers.*

Only charge the battery within specified conditions (e.g., temperature range, voltage, and current). Use of an unauthorized charger could cause the battery to generate heat, smoke, catch fire, or explode.

### (4) Reverse Polarity

*Do not attach or insert battery with polarity reversed.*

A battery has polarity. If the battery does not easily fit into the charger or device, check the battery's orientation. Do not force the battery into the battery compartment. If attached to the device with reversed polarity, the battery may generate heat, smoke, catch fire, or explode.

### (5) Direct Connection

*Do not connect the battery to an AC outlet or DC automotive plug.*

The battery requires a specific charger. If the battery is connected directly to a power outlet, the battery may generate heat, smoke, catch fire, or explode.

### (6) Use in Other Equipment

*Do not use the battery in equipment for which it was not intended.*

If the battery is used in unapproved applications or systems, the battery may become damaged and generate heat, smoke, catch fire, or explode.

### (7) Incineration and Heat

*Keep the battery away from heat and fire.*

Heat will damage the battery and may cause it to generate heat, smoke, catch fire, or explode.

(8) Short-Circuit

*Do not apply a short- circuit.*

Do not connect the positive (+) and negative (-) terminals with a conductive material. Do not carry or store the battery with any metal objects. If the battery is shorted, the shorting item may overheat and the battery may generate heat, smoke, catch fire, or explode.

(9) Impact

*Avoid excessive impact to the battery.*

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

(10) Penetration

*Do not penetrate the battery with a nail or strike with a hammer.*

If subjected to a hard strike or penetrated by an object, the battery may be damaged or destroyed, thereby causing an internal short-circuit. This may cause the battery to generate heat, smoke, catch fire, or explode.

(11) Soldering

*Do not directly solder to the battery.*

Soldering directly to the battery could melt the separator or damage the gas release vent or other safety mechanisms. This may cause the battery to generate heat, smoke, catch fire, or explode.

(12) Disassembly

*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.

(13) Charge near High Temperatures

*Do not charge the battery near high temperature.*

If the battery is charged while exposed to high temperature, the battery's protection circuit may activate and prevent charging, or fail and cause the battery to generate heat, smoke, catch fire, or explode.

(14) Deformation

*Do not use the battery with conspicuous damage or deformation.*

It causes the generating heat, smoke, rupture or flame.

(15) Reverse Charge and Overdischarge

*Do not reverse polarity (and terminals).*

On charging, the battery is reverse-charged and abnormal chemical reaction occurs. And also, there may be case that unexpected large current flows a discharging. These cause the generating heat, smoke, rupture or flame.

### *Warning*

#### (1) Ingestion

*Keep away from small children.*

Keep the battery away from small children. If the battery or any of its component parts is swallowed, seek medical attention immediately.

#### (2) Storage

*Do not place the battery in or near a microwave or other cooking appliances.*

If subjected to heat or electromagnetic radiation, the battery may leak, generate heat, smoke, catch fire, or explode.

#### (3) Mixed Use

*Do not mix with other batteries.*

The battery should not be used with other batteries having a different capacity, chemistry, or manufacturer. Doing so could cause the battery to generate heat, smoke, catch fire, or explode.

#### (4) Rust, Discoloration and Deformities

*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.

#### (5) Charging Time

*Stop charging if the charging process cannot be finished.*

If the battery cannot finish the charging process within the specified time, halt the charging process. The battery may generate heat, smoke, catch fire, or explode.

#### (6) Leakage CD

*Do not use a leaking battery near open flame.*

If the battery or liquid leaking from the battery has an irritating odor, the battery should be kept away from any open flame. If exposed to an open flame, the battery could ignite and explode.

#### (7) Leakage

*Do not touch a leaking battery.*

If liquid leaking from the battery gets into your eyes, immediately flush your eyes with clean water and seek medical attention. If left untreated, it will cause significant eye damage.

## (8) Transport

*Pack the battery securely for transport.*

To prevent short-circuit or damage during transport, securely pack the battery in a case or carton.

### *Caution*

#### (1) Exposure to Direct Sunlight

Do not use or leave the battery in a location exposed to excessive heat, such as in direct sunlight or in a car. Doing so could cause the battery to generate heat, smoke, catch fire, or explode. It may also cause the battery's performance and life to deteriorate.

#### (2) Static Electricity

The battery pack has a protection circuit. Do not use the battery where static electricity in excess of

100V is generated as it may damage the protection circuit. If the protection circuit fails, the battery may generate heat, catch fire, smoke, or explode.

#### (3) Charging Temperature Range

Only charge the battery between 10°C and 45°C. Charging outside of this temperature range may cause the battery to leak, generate heat, or result in serious damage. It may also cause the battery's

performance and life to deteriorate.

#### (4) Manual

Read the manual before use. Keep for future reference.

#### (5) Charging Method

Read the charger manual before use for proper charging method.

#### (6) First Time Usage

Please contact the supplier if the battery gives off an unusual odor, generates heat, or shows signs of rust prior to its initial use.

#### (7) Use by Children

Parents must explain how to use the system and the battery. Please check back periodically to ensure children are using the system and the battery correctly.

#### (8) Flammable Materials

Do not charge or discharge near flammable materials. Doing so could result in fire.

#### (9) Leakage

If electrolyte leaks from the battery and comes into contact with skin or clothing, immediately flush with water. Otherwise, it may cause skin irritation.

#### (10) Handling of Exposed Contacts or Conductors

If the battery pack has a system interface consisting of stripped lead wires or exposed contact plates, handle with due care. Temporarily insulate exposed contacts and conductors with an insulator such as polypropylene tape or polyvinylchloride tape. Failure to do so could result in an electrical shock; a short circuit causing the battery to generate heat, smoke, catch fire, or explode; or the combustion of other materials.

#### (11) Recycling

When disposing of the battery, recycle it according to local rules and regulations.

##### *Notice*

Wear protective gloves and goggles while working on cells or batteries. Wash hands after working. Insulated tools are to be used. Do not process product mechanically, do not impact, bump, crush, buckle, indent or modify otherwise (tabs, rims, edges), and strictly adhere to specifications and parameters of technical data sheets for operation (charge – discharge) and storage. Do not open, destroy, penetrate, bend, heat or let heat product, do not throw in fire, do not short-circuit, not dump in water or wipe or clean with water, do not drop or drop something on it, do not put in or operate in microwaves, ovens or pressure vessels or similar. Do avoid similar actions or impact of any kind. Use only in accordance with specifications and charge according to the operating instructions and with chargers approved and certified for lithium-ion systems.

##### *Legal notice:*

These batteries are no "substances" or "preparations" according to Regulation (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).

##### *Air Transport of damaged or defective batteries- waste batteries*

Batteries, that have been identified as defective for safety reasons by the manufacturer, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit, are **forbidden** for transport (e.g. those being returned to the manufacturer for safety reasons) (esp. IATA A154).

Waste batteries and batteries being shipped for recycling or disposal are **prohibited** from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.