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**Lithium ion cells and batteries used in portable
electronic equipments - Safety requirements**

便携式电子产品用锂离子电池和电池组 安全要求

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Foreword

All technical content of this standard is mandatory.

This Standard is drafted in accordance with the rules specified in GB/T 1. 1-2009.

This standard is proposed by Ministry of Industry and Information Technology of the People's Republic of China.

This standard is under jurisdiction of China Electronics Standardization Institute

Drafting units of this Standard are China Electronics Standardization Institute, Shenzhen BAK Battery Co., Ltd., Tianjin Lishen Battery Joint-Stock Co., Ltd., Amperex Technology Limited, SUNWODA Electronics Co., Ltd., SCUD (Fujian) Electronics Co., Ltd., Vimicro Co., Ltd. And Beijing Saixi Science and Technology Development Co., Ltd

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Introduction

This introduction is intended to introduce the principles being based by the standard. Understanding those principles is necessary to design and safely produce lithium ion cells and lithium ion batteries. There is need to note that this standard only considers the most basic safety requirements of lithium ion cells and lithium ion batteries to provide protection for the safe of persons and property without involving the performance and features.

The further development of technology and process will inevitably require the further modification of this standard.

The hazards caused by lithium ion cells and lithium ion batteries within the scope of this standard means:

- leakage, which may cause chemical corrosion hazard to human body directly or cause the internal insulation failure of battery-powered electronic equipment, resulting in electric shock, fire and other dangerous;

- Fire, which directly burn the body or cause fire hazard to battery-powered electronic equipment.

- Explosion, which directly endanger the human body or damage the equipment;

- Overheating, which directly cause burn on bodies, reduce the insulation level and performance of safety-related components or ignite flammable liquids.

Leakage danger may be caused by the housing damage for internal stress or external stress. The fire and explosion may be caused by thermal runaway inside the battery, which may be caused by the short circuit within the battery, strong oxidation of battery materials and others.

In determining the design program of cell or battery, the following priorities shall be complied with:

- Firstly, if possible, use materials with high safe performance first and avoid using materials prone to thermal runaway as far as possible:

- Secondly, if the above principles cannot be implemented, there is a need to design protection device to reduce or eliminate the possibility of risk, such as increasing protection devices;

- Finally, if the above-mentioned programs and other measures cannot completely avoid

the occurrence of risk, there is a need to take identification and description measures for the hazardous of residues.

The above principles cannot replace the detailed requirements of this standard, which just allow the designers to understand the principles based by the requirements.

The safety of lithium ion cells and lithium ion batteries is related to the selection, design, production technology, transport and use conditions of materials, among which the use condition includes the normal use conditions, foreseeable misuse conditions and foreseeable fault conditions and also includes conditions affecting the safe, such as temperature, altitude and so on.

The safety requirements of the lithium ion cells and lithium ion batteries cover dangers caused by all the above factors to personnel. The personnel refer to maintenance personnel and use personnel.

Maintenance personnel refer to maintenance personnel to electronic equipment and batteries. If there is obvious dangerous, the maintenance personnel can use professional skills to avoid possible injury. However, the maintenance personnel is need to do protection on unexpected danger, for example, use identification or warning instructions to alert maintenance personnel of the dangerous of residues.

Use personnel refer to all personnel other than maintenance personnel. Security requirements are proposed under the condition where assuming that that the use personnel without being trained to how to recognize danger will not intentionally create a dangerous situation.

The material selection, design, technology and other aspects of the production process of lithium ion cells and lithium ion batteries are essential to its security. The quality control example of the production process is shown in Annex A and the design and manufacturing process can be referred to Annex B.

Lithium ion cells and batteries used in portable electronic equipments—Safety requirements

1 Scope

This standard specifies the safety requirements of lithium ion cell and lithium battery for portable electronic equipment.

This standard applies to lithium ion cell and lithium battery for portable electronic equipment (hereinafter referred to as cell and battery). The portable electronic equipment belonging to the range of this standard is exemplified as follows:

- a) Portable office products: notebook computers, PDA and so on.
- b) Mobile communications products: cell phones, cordless phones, Bluetooth headsets, walkie-talkie and so on.
- c) Portable audio / video products: portable televisions, portable DVD players, MP3 / MP4 players, camera, video cameras, voice recorder and so on.
- d) Other portable products: electronic navigation devices, digital photo frames, game machine, e-books and so on.

Portable electronic equipment listed above does not include all of the products, so the products being not listed are not certain to beyond the scope of this standard.

There maybe additional requirements to lithium ion cell and lithium ion battery for portable electronic product used on vehicles, ships, and airplanes and other special occasions as well as for health care, mining, submarine operations and other special fields,

2 Normative references

Following documents are indispensable for application of this document. For the dated documents so quoted, only dated versions apply to this document. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB 4943.1 Information technology equipment - Safety - Part 1:General requirements

GB/T 5169.5 - 2008 Fire hazard testing for electric and electronic products - Part 5: Test flames - Needle test method - Apparatus confirmatory arrangement and guidance

GB/T 5330 - 2003 Industrial woven metal wire cloth (square opening series)

GB/T 6005 - 2008 Test sieves - Metal wire cloth perforated metal plate and electroformed



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