

# 材料安全数据表

## Material Safety Data Sheet

样品名称: 锂离子电池

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Name of Sample: Lithium-ion Battery

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委托单位: 深圳市博富能电池有限公司

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Commissioner: Shenzhen Bofuneng Battery Co., Ltd.

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威凯检测技术有限公司  
Vkan Certification & Testing Co., Ltd.



## 材料安全数据表

## Material Safety Data Sheet

1. 化学品及企业标识 Chemical product and company identification	
样品名称 Name of Sample	锂离子电池 Lithium-ion Battery
样品型号 Type/Mode	18650 1800mAh 3.7V 1800mAh 6.66Wh
委托单位 Commissioned by	深圳市博富能电池有限公司 Shenzhen Bofuneng Battery Co., Ltd.
委托单位地址 Commissioner address	深圳市龙岗区龙城街道五联社区朱古石路春洋工业园 A、E 栋 A&E Building, Chunyang Industrial Park, Zhugushi Road, Wulian, Longcheng, Longgang, Shenzhen, P. R. China
生产单位 Manufacturer	深圳市博富能电池有限公司 Shenzhen Bofuneng Battery Co., Ltd.
生产单位地址 Manufacturer address	深圳市龙岗区龙城街道五联社区朱古石路春洋工业园 A、E 栋 A&E Building, Chunyang Industrial Park, Zhugushi Road, Wulian, Longcheng, Longgang, Shenzhen, P. R. China
鉴定依据 Inspection according to	EEC Directive 93/112/EC 联合国《关于危险品货物运输的建议书》 UN "Recommendations on the TRANSPORT OF DANGEROUS GOODS"
应急电话 Emergency telephone call	0755-84642975
-	接样日期: 2017-12-25 Receiving date: 2018.12.27 签发日期: 2018.12.27 Date of issue: 2018.12.27



Approved by:

批准:

Reviewed by:

审核:

Tested by:

主检:

2. 成分/组成信息 Composition information			
材料及组分 Material or ingredient	化学式 Chemical Formula	CAS 号 CAS No.	重量含量 Wt %
氧化锂钴 Lithium Cobalt Oxide	LiCoO <sub>2</sub>	12190-79-3	39.6
丁苯橡胶 SBR	(C <sub>8</sub> H <sub>8</sub> .C <sub>4</sub> H <sub>6</sub> ) <sub>x</sub>	9003-55-8	1.78
(PE) 聚乙烯 polyethylene	(CH <sub>2</sub> H <sub>4</sub> ) <sub>n</sub>	9002-88-4	0.06
聚偏二氟乙烯 PVDF	(CH <sub>2</sub> CF <sub>2</sub> ) <sub>n</sub>	24937-79-9	1.15
石墨 Graphite	C	7782-42-5	23.2
六氟磷酸锂 Lithium Hexafluorophosphate	LiPF <sub>6</sub>	21324-40-3	15.35
碳酸乙烯酯 Ethylene carbonate	C <sub>3</sub> H <sub>4</sub> O <sub>3</sub>	96-49-1	2.72
铜箔 Copper Foil	Cu	7440-50-8	9.8
铝箔 Aluminum Foil	Al	7429-90-5	5.56
(PP) 聚丙烯 Polypropylene	(CH <sub>3</sub> H <sub>6</sub> ) <sub>n</sub>	9003-07-0	0.78
铅 Lead	Pb	7439-92-1	无 Not Detected
镉 Cadmium	Cd	7440-43-9	无 Not Detected
汞 Mercury	Hg	7439-97-6	无 Not Detected

3. 危险性概述 Hazards identification	
爆炸危险性 Explosive risk	该物品不属于爆炸危险品 This article does not belong to the explosion dangerous goods
易燃危险性 Flammable risk	该物品不属于易燃危险品 This article does not belong to the flammable material
氧化危险性 Oxidation risk	该物品不属于氧化危险品 This article does not belong to the oxidation of dangerous goods
毒害危险性 Toxic risk	该物品不属于毒害危险品 This article does not belong to the toxic dangerous goods
放射危险性 Radioactive risk	该物品不属于放射危险品 This article does not belong to the radiation of dangerous goods
腐蚀危险性 Mordant risk	该物品不属于腐蚀危险品 This article does not belong to the corrosion of dangerous goods
其他危险性 other risk	该物品为锂离子电池，瓦时率 6.66Wh，属于锂离子电池（包括锂聚合物电池） This article is Li-ion Battery, Watt hour rate 6.66Wh, which belong to the Lithium ion batteries (including lithium polymer batteries)

#### 4. 急救措施

##### First aid measures

**眼睛:** 万一接触, 立即用大量的清水冲洗至少 15 分钟, 翻起上下眼睑, 直到化学的残留物消失为止, 迅速就医。

**Eye:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**皮肤:** 万一接触, 用大量水冲洗至少 15 分钟, 同时除去污染的衣物和鞋子, 迅速就医。

**Skin:** Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

**吸入:** 立即从暴露处移至空气清新处, 如果呼吸困难给予输氧, 立即就医。

**Inhalation:** Remove from exposure and move to fresh air immediately. Use oxygen if available.

**食入:** 饮用两杯牛奶或水。如果当事人仍然清晰可以采取催吐的方法, 并且立即就医。

**Ingestion:** Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician

#### 5. 消防措施

##### Fire-fighting measures

**燃点:** 不适用

**Flash Point:** N/A.

**自燃温度:** 不适用

**Auto-Ignition Temperature:** N/A.

**灭火介质:** 大量水 (降温), 二氧化碳

**Extinguishing Media:** Water, CO<sub>2</sub>.

**特殊灭火程序:** 自给式呼吸器

**Special Fire-Fighting Procedures**

Self-contained breathing apparatus.

**异常火灾或爆炸:** 当电芯暴露于过热的环境中时, 安全阀可能会打开。

**Unusual Fire and Explosion Hazards**

Cell may vent when subjected to excessive heat-exposing battery contents.

**燃烧产生的危险物品:** 一氧化碳, 二氧化碳, 锂氧化物烟气

**Hazardous Combustion Products**

Carbon monoxide, carbon dioxide, lithium oxide fumes.

#### 6. 泄露应急处理

##### Accidental release measures

**为防止电池材料泄露或释放采取的措施**

如果电池内部材料泄露, 试验人员应立刻撤离试验区直到烟气消散。将通风设备打开吹散危险性气体。用抹布擦净试验区, 清除溢出的液体, 将泄露电池放进塑料袋中, 然后放进钢制容器。避免皮肤和眼睛接触或吸入有害气体。

**Steps to be taken in case Material is Released or Spilled**

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a

plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

#### 废弃物处置方法

建议将电池完全放电，消耗电池内部的锂金属，并且深埋于土壤中。

#### Waste Disposal Method

It is recommended to discharge the battery to the end, to use up the metal lithium inside the battery, and to bury the discharged battery in soil..

## 7. 操作处置和储存 Handling and storage

禁止打开、毁坏或焚烧电池，因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。

禁止将电池短路、过充、强制放电或扔入火中。禁止挤压刺穿电池或将电池浸入溶液中。

The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container.

Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire.

Do not crush or puncture the battery, or immerse in liquids.

#### 操作处置和储存中的防范措施

禁止物理或电滥用，禁止高温储存，最好将电池储存在阴凉、干燥、通风及温度变化较小的环境中。禁止将电池接触加热设备或将电池直接暴露与阳光中。

#### Precautions to be taken in handling and storing

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

#### 其他要注意的防范措施

拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。

#### Other Precautions

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

## 8. 接触控制/个人防护 Exposure controls/personal protection

#### 呼吸防护:

当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。

#### Respiratory Protection

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

#### 通风条件

正常使用条件下不必考虑。

#### Ventilation

Not necessary under conditions of normal use.

**防护手套**

正常使用条件下不必考虑。

**Protective Gloves**

Not necessary under conditions of normal use.

**其他防护服装或设备**

正常使用条件下不必考虑。

**Other Protective Clothing or Equipment**

Not necessary under conditions of normal use.

**电池开阀试验时应做好个人防护**

呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。

**Personal Protection is recommended for venting battery**

Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

## 9. 物理和化学特性 Physical and chemical properties

**外形:** 圆柱形

**Appearance:** Cylindrical

**认证编号:** RZUN2015-0963

**Ref, No.:** RZ2015-0963

**充放电性能:** 最大持续电流 5.4A ,最大瞬间电流 9A

**Charge discharge performance:** Maximum continuous current 5.4A, maximum instantaneous current 9A

**气味:** 泄漏时，有醚的气味。

**Odour:** If leaking, smells of medical ether.

**酸碱度:** 不适用

**pH:** Not applicable as supplied.

**闪点:** 针对单个组分暴露情况，其他不适用。

**Flash Point:** Not applicable unless individual components exposed.

**易燃度:** 针对单个组分暴露情况，其他不适用。

**Flammability:** Not applicable unless individual components exposed.

**相对密度:** 针对单个组分暴露情况，其他不适用。

**Relative density:** Not applicable unless individual components exposed.

**溶解性 (水溶性):** 针对单个组分暴露情况，其他不适用。

**Solubility (water):** Not applicable unless individual components exposed.

**溶解性 (其他):** 针对单个组分暴露情况，其他不适用。

**Solubility (other):** Not applicable unless individual components exposed.

## 10. 稳定性和反应活性 Stability and reactivity

**稳定性:** 产品在第 7 节所述的条件下稳定。

**Stability:** Product is stable under conditions described in Section 7.

**应避免的条件:** 加热 70°C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路，长时间暴露

在潮湿的条件下。

**Conditions to Avoid :** Heat above 70°C or incinerate. Deform. Mutilate. Crush. Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions.

**应避免的材料:** 氧化剂, 碱, 水。

**Materials to avoid:** Oxidising agents, alkalis, water.

**危险分解物:** 有毒烟雾, 并可能形成过氧化物。

**Hazardous Decomposition Products :** Toxic Fumes, and may form peroxides.

**聚合危害:** 不适用

**Hazardous Polymerization :** N/A.

如果发生泄露, 避免与强氧化剂, 无机酸, 强碱, 卤代烃接触。

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons.

## 11. 毒理学资料 Toxicological information

**标志及症状:** 无, 除非电池破裂。

**Signs & symptoms:** None, unless battery ruptures.

内部物质暴露的情况下, 蒸汽烟雾可能对眼睛和皮肤的刺激性。

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

**吸入:** 对肺有刺激性。

**Inhalation:** Lung irritant.

**皮肤接触:** 对皮肤刺激性。

**Skin contact:** Skin irritant.

**眼睛接触:** 对眼睛有刺激性。

**Eye contact:** Eye irritant

**食入:** 吞下中毒。

**Ingestion:** Poisoning if swallowed..

下列情况下会危险人员身体健康: 如果与电池内部材料直接接触, 皮肤可能会出现干燥、灼烧等轻微或严重的刺激, 并且损坏靶器官的神经, 肝脏和肾脏。

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, moderate to server irritation, burning and dryness of the skin may occur, Target organs nerves, liver and kidneys.

## 12. 生态学资料 Ecological information

**对哺乳动物的影响:** 目前未知。

**Mammalian effects:** None known at present.

**生态毒性:** 目前未知。

**Eco-toxicity:** None known at present.

**生物体内积累:** 慢慢地生物降解。

**Bioaccumulation potential:** Slowly Bio-degradable.

**环境危害:** 目前没有已知的环境危害。

**Environmental fate:** None known environmental hazards at present.

## 13. 废弃处置 Disposal consideration

禁止焚烧, 或使电池温度超过 70°C, 这种滥用可导致泄漏和/或电池爆炸。应按照相应的地方性

法规处理。

Do not incinerate, or subject cells to temperature in excess of 70°C, Such abuse can result in loss of seal leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

#### 14. 运输信息 Transport information

**运输标签:** 锂电池标记, 第九类危险品标签, 仅限货机标签

**Label for conveyance:** Lithium Battery Mark, Class 9 Hazard Label, Cargo Aircraft Only Label

**UN 编号:** UN3480

**UN Number:** UN3480

**包装级别:** 不适用

**Packaging Group:** N/A

**EmS 编号:** F-A ,S-I

**EmS No:** F-A ,S-I

**海洋污染物:** 无

**Marine pollutant:** No

**正确的装运名称:** 锂离子电池 (包括锂离子聚合物电池)

**Proper Shipping name:** Lithium ion batteries (Including lithium ion polymer batteries)

**危害分类:** 货物应遵守 IATA 第 59 版 DGR 手册包装说明 965 第 IB 节规定 (2018 年版) 和特殊规定 188 海运危险货物规则 (Amdt. 38-16) 2016 年版, 包括通过 UN38.3 测试手册要求。

**Hazard Classification:** The goods shall be complied with the requirements of Section IB of Packing Instructions 965 of 59th DGR Manual of IATA (2018Edition) and special provision 188 of IMDG CODE (Amdt. 38-16) 2016 Edition, including the passing of the UN38.3 test.

#### 15. 法规信息 Regulation information

法律信息

Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

《危险品安全运输技术指令》

《Technical Instructions for the Safe Transport of Dangerous Goods》



《危险货物分类和品名编号》  
《Classification and code of dangerous goods》  
《职业安全卫生法》  
《Occupational Safety and Health Act》 (OSHA)  
《有毒物质控制法》  
《Toxic Substance Control Act》 (TSCA)  
《消费产品安全法》  
《Consumer Product Safety Act》 (CPSA)  
《联邦环境污染控制法》  
《Federal Environmental Pollution Control Act》 (FEPCA)  
《石油污染法案》  
《The Oil Pollution Act》 (OPA)  
《超级基金修正案和再授权法案III(302/311/312/313)》  
《Superfund Amendments and Reauthorization Act TitleIII (302/311/312/313)》 (SARA)  
《资源保护及恢复法案》  
《Resource Conservation and Recovery Act》 (RCRA)  
《安全饮用水法》  
《Safety Drinking Water Act》 (CWA)  
《加州 65 提案》  
《California Proposition 65》  
《美国联邦法规》  
《Code of Federal Regulations》 (CFR)  
根据所有联邦、州和地方法律。  
In accordance with all Federal, State and local laws.

## 16. 其他信息 Other information

本文件仅对由委托方（深圳市博富能电池有限公司）提供的，并由深圳市博富能电池有限公司生产的单电芯电池（18650 1800mAh）有效。该电池的成分信息由委托方提供并承诺其完整性和准确性。用户应仔细阅读此文件，并按照正确的方法使用电池，如因电池使用不当造成的损害或损失，威凯检测技术有限公司（CVC）不承担任何责任。

This file is only effective to the batteries (18650 1800mAh) provided by commissioner (Shenzhen Bofuneng Battery Co., Ltd.), which manufactured by Shenzhen Bofuneng Battery Co., Ltd.. The commissioner provides the composition information of batteries, and promises its integrity and accuracy. Users should read this file carefully, and use the batteries in correct method. Vkan Certification & Testing Co., Ltd. (CVC) doesn't assume responsibility for any damage or loss because of misuse of batteries.

## 注 意 事 项

### Important Notice

1. 本鉴定报告书仅对送检样品有效。

This report is valid for the tested samples only.

2. 申请人提供的样品须与实际运输货物一致。

The goods of transporting must be insure conformity with the testing samples.

3. 本鉴定报告书无检验单位印章、骑封章无效。

This report is invalid without the official stamp of CVC and Paging seal of CVC.

4. 本鉴定报告书无批准人、审核人及鉴定人签名无效。

This report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.

5. 本鉴定报告书涂改无效。

This report is invalid if altered.

6. 本鉴定报告仅原件有效，复印件、传真件及电子版均无效。

The original copy of this report is the only valid version. Any other versions of this report, whatever it is in form of photocopy, fax, or electronic media, or others, are considered to be invalid.

7. 本报告仅供委托方内部质量控制使用，不对社会公开出具。

This report is only used for internal quality controlling of the client.

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*Safety Data Sheet*

# SDS

## SAFETY DATA SHEET

**Prepared For** : Zhangzhou Wah Fu New Energy Technology Co., Ltd.  
Zhangzhou City, Fujian Province Yunling Yunling Industrial  
Development Zone LED Avenue.

**Prepared By** : Shenzhen SEM.Test Technology Co., Ltd.  
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Road, Bao'an District, Shenzhen, P.R.C. (518101)

**Issue Date** : Jan. 30, 2018  
**Report Number** : STRD1801168S

**Written by:** Sean Zeng

**Approved by:** Davis yang



## Section 1-Chemical Product and Company Identification

**Product:** li-ion battery

**Common name:** li-ion battery

**Model:** 18650 Lithium ion 7.4V 6000mAh/44.4wh

**Rating of battery:** 7.4V, 6000mAh, 44.4Wh

**Trademark:** N/A

**Weight:** 283g

**Shape and Physical Dimension (mm):**  $\Phi$  69.1\*55.3\*37.4mm

**Manufacture:** Zhangzhou Wah Fu New Energy Technology Co., Ltd.

**Address:** Zhangzhou City, Fujian Province Yunling Yunling Industrial Development Zone LED Avenue.

**Telephone number of the supplier:** +86-0755-84533464

**Fax No:** +86-0755-84533464

**Emergency Telephone:** +86-13143440651

**Post Code:** 518116

**E-mail address:** yqh@huarui-battery.com

## Section 2- Hazards Identification

### (a) Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an MSDS/SDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (repeated exposure) Category	Category 1
Flammable liquid and vapor	Category 3

### (b) GHS Label elements, including precautionary statements

## Emergency Overview

**Signal word****Hazard Statements**

Causes skin irritation

Causes serious eye damage

May cause cancer

Suspected of damaging fertility or unborn exposure

Contains gas under pressure; may explode if heated



This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture: the above hazards exist.

Appearance Blue

Physical State Solid

Odor Odorless

**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling.

Wear protective gloves/protective clothing/eye protection/face protection

Do not breathe dust/fume/gas/mist/vapors/spray

Do not eat, drink or smoke when using this product

**Precautionary Statements - Response**

Specific treatment (see supplemental first aid instructions on this label)

Get medical advice/attention if you feel unwell

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing. Immediately call a POISON CENTER or doctor/physician

**Skin**

IF ON SKIN: Wash with plenty of soap and water

If skin irritation occurs: Get medical advice/attention

Take off contaminated clothing and wash before reuse

**Precautionary Statements - Storage**

No information available.

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**(c) Hazards not otherwise classified (HNOC)**

No information available.

**(d) Unknown Toxicity**

10% of the mixture consists of ingredient(s) of unknown toxicity.

**(e) Other information**

No information available.

**(f) Interactions with Other Chemicals**

No information available.

**Section 3- Composition/Information on Ingredient**

Common Chemical Name	Concentration (%)	CAS Number	EC No.
Lithium manganese oxide(LiMn2O4)	44	12057-17-9	---
Aluminum Foil (Al)	12	7429-90-5	231-072-3
1,1-Difluoroethylene polymer	1	24937-79-9	----
Graphite	19	7782-42-5	231-955-3
Copper	8	7440-50-8	231-159-6
Styrene-Butadiene polymer	3	9003-55-8	----
Polyethylene	3	9002-88-4	200-815-3
Polypropylene	2	9003-07-0	----
Phosphate(1-), hexafluoro-, lithium	3	21324-40-3	244-334-7
Ethylene carbonate	5	96-49-1	202-510-0

**Section 4- First Aid Measures**

The battery is not hazard with eye and skin contact under normal circumstance. In case of the enclosure is damaged, the battery can not be used and touched. It is safety except that the battery is damaged by fire or rupture. The leakage of internal hazardous substance and formation of hazardous substance would occur, take the following measures if contact with the battery.

**Skin touch:** If there is any unwell reaction, wash thoroughly with soap & water, flush with plenty of water. If irritation persists, seek medical advice.

**Eyes touch:** Rinse immediately with plenty of water for at least 15 mins. Contact a doctor if symptoms persist.

**Inhalation:** Remove from exposure site to fresh air. Keep at rest. Obtain medical attention.

**Ingestion:** Rinse mouth out with water. Seek medical advice immediately.

**Self-protection of the first aider:** Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

#### **Information for doctor**

**Most important sumpoms and effects, both acute and delayed:** no further relevant information available.

**Indication of any immediate dedical attention and special treatment needed:**No further relevant information availabel

### **Section 5- Fire Fighting Measures**

#### **(a) Extinguishing media**

Suitable extinguishing media: Use foam, dry powder or dry sand, CO2 as appropriate.

Unsuitable extinguishing media: No information available.

#### **(b) Special hazards arising from the chemical**

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO, CO2, Metal oxides, Irritating fumes.

#### **(c) Special protective equipment and precautions for fire-fighters**

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filtermask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish

extinguishment.

## Section 6- Accidental Release Measures

### Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate. Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage of the battery happens, liquid could be absorbed with sand, earth or other inert substance and contaminated area should be ventilated meantime.

### Environment precautions:

Do not allow product to reach sewage system or any water source.  
Inform respective authorities in case of seepage into water course or sewage system.  
Do not allow to enter sewers/ surface or ground water.

### Methods and material for containment and cleaning up:

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

## Section 7- Handling and Storage

### Precautions for safe handling:

Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries Use recommended charging time and current.

### Storage conditions:





If the batteries are subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion battery periodically.

Storage Temperature:

Short period less than 3 months: -20~+45°C, 75%RH Max

Long period more than 3 months: +5°C~+35°C, 75%RH Max

Do not storage Li-ion battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. Keep out of reach of children. Do not expose Li-Polymer battery to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials.

Section 8- Exposure Controls, Personal Protection

(a)Control parameters

Exposure Guidelines

Table with 4 columns: Chemical Name, ACGIH TLV, OSHA PEL, NIOSH IDLH. Rows include Lithium Cobalt Oxide, Aluminum, Copper, and Phosphate(1-), hexafluoro-, lithium.

ACGIH TLV: American Conference of Governmental Industrial Hygienists -Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits Immediately Dangerous to Life or Health

Other Exposure Guidelines: Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962(11th Cir., 1992) See section 15 for national exposure control parameters

(b) Appropriate engineering controls

Engineering Measures: 1.Showers 2.Eyewash stations 3.Ventilation systems

**(c) Individual protection measures, such as personal protective equipment**

**Respiratory protection:** No necessary under normal use. In case electrolyte leakage from the battery, protect hand with chemical resistant rubber gloves. If battery is burning, leave the area immediately. In abuse, use NIOSH approved acid gas filter mask or self-contained breathing apparatus.

**Hand protection:** None under normal use. In case of spilling, use PVC, neoprene or nitrile gloves of 15mils (0.015 inch) or thicker.

**Eye/Face protection:** None required under normal conditions. Use approved chemical work safety goggles or face shield, if handling a leaking or rupture battery.

**Skin and body protection:** No necessary under normal use. Use rubber apron and protective working in case of handling of a rupture battery.

**Other protective equipment:** Chemical resistance clothing is recommended along with eye wash station and safety shower should be available. Work hygienic practices: Use good chemical hygiene practice. Wash hands after use and before drinking, eating or smoking. Wash hands thoroughly after cleaning-up component spill caused by leaking battery. No eating, drinking, or smoking in battery storage area. Launder contaminated cloth before reuse.

**Section 9- Physical and Chemical Properties**

**Information on basic physical and chemical properties**

**General information**

**Form:** Solid      **Colour:** Blue      **Odour:** Odourless      **Odour threshold:** Not available

**pH-value:** Not available

**Change in condition**

**Melting point/Melting range:** Not available

**Boiling point/Boiling range:** Not available

**Freezing point:** Not available

**Flash point:** Not available

**Flammability (solid, gaseous):** Not available

**Auto-Ignition temperature:** Not available

**Decomposition temperature:** Not available

**Self-igniting:** Product is not selfigniting.

**Explosive properties:** Risk of explosion by shock, friction, fire or other sources of ignition.

**Explosion limits**

**Lower:** Not available

**Upper:** Not available

**Oxidizing properties:** Not available

**Vapour pressure:** Not available

**Density:** Not available

**Relative density:** Not available

**Vapour density:** Not available

**Evaporation rate:** Not available

**Solubility in / Miscibility with water:** Not available

**Partition coefficient (n-octanol/water):** Not available.

**Viscosity**

**Dynamic:** Not available.

**Kinematic:** Not available

**Other information:** No further relevant information available.

**Section 10- Stability and reactivity**

**(a) Reactivity**

Stable under recommended storage and handling conditions.

**(b) Chemical stability**

Stable under normal conditions.

**(c) Possibility of hazardous reactions**

When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies controlled release of pressure without ignition.

**(d) Conditions to avoid**

Do not subject Li-ion Battery to mechanical shock. Keep away from open flames, high temperature.

**(e) Incompatible materials**

Strong oxidizer, strong acid.

**(f) Hazardous decomposition products**

Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

**Section 11- Toxicological information**

**(a) Information on the likely routes of exposure**

**Inhalation:** Inhalation of a large number of vapors or fumes released due to heat may cause respiratory.

**Ingestion:** Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.

**Skin contact:** Contact with battery electrolyte may cause burns and skin irritation.

**Eye contact:** Contact with battery electrolyte may cause burns. Eye damage is possible.

Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 4. Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up.

**(b) Information on toxicological characteristics**

Acute toxicity: No data available.

Skin corrosion/irritation: The liquid in the battery irritates.

Serious eye damage/irritation: The liquid in the battery irritates.

Respiratory sensitization: The liquid in the battery may cause sensitization to some person.

Skin sensitization: The liquid in the battery may cause sensitization to some person.

Carcinogenicity: Cobalt and Cobalt compounds are considered to be possible human carcinogen(s).

Germ Cell Mutagenicity: No data available.

Reproductive Toxicity: No data available.

STOT-Single Exposure: No data available.

STOT-Repeated Exposure: No data available.

Aspiration Hazard: No data available.

Sensitization: No data available.

Mutagenic Effects: No data available.

Carcinogenicity: No data available.

Reproductive Toxicity: No data available.

Chronic Toxicity: No data available.

Target Organ Effects: No data available.

Aspiration Hazard: No data available.

## Section 12- Ecological Information

### Toxicity

- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behaviour in environmental systems:** No further relevant information available
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.

### · Additional ecological information

#### · General notes:

Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

#### · Results of PBT and vPvB assessment

- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

## Section 13- Disposal Considerations

**Nature of waste:** Hazardous Waste

### Waste disposal methods:

- a. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in federal, state or local requirements of hazardous waste treatment and hazardous waste transportation.
- b. Incineration should never be performed by battery used. The batteries contained recyclable materials.

Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.

- c. The battery should have their terminal insulated in order to prevent short circuits during transportation to the disposal site.

**Note:** Consult your local or region authorities, disposal maybe subject to national, state, or local laws.

### Section 14 – Transport Information

According to **PACKING INSTRUCTION 965 of IATA DGR 59rd Edition** for transportation, the special provision 188 of IMDG (inc Amdt 35-10). The batteries should be securely packed and protected against short-circuits.

Examine whether the package of the containers are integrate and tighten closed before transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles. Don't put the goods together with oxidizer and chief food chemicals. The transport vehicle and ship must be cleaned and sterilized otherwise it is not allowed to assemble articles. During transport, the vehicle should prevent exposure, rain and high temperature.

For stopovers, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source.

Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area. Forbid to use wooden, cement for bulk transport.

**UN-Number**

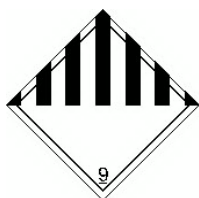
· ADR, IMDG, IATA UN3480

**UN proper shipping name**

· ADR Lithium ion batteries  
 · IMDG, IATA Lithium ion batteries

**Transport hazard class(es)**

· ADR, IMDG, IATA



Class 9 Miscellaneous dangerous substances and articles.

Label 9



**Packing group**

· ADR, IMDG, IATA                      IB

· **Marine pollutant:**                      No

**Special precautions for user:** Warning: Miscellaneous dangerous substances and articles.

· **Danger code (Kemler):** -

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.

· **UN "Model Regulation":** UN3480, Lithium ion batteries, 9, IB

**Section 15- Regulatory information**

OSHA hazard communication standard (29 CFR 1910.1200)

\_\_\_\_\_ Hazardous                       Non-hazardous

**Section 16- Other Information**

**Note:** The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.