

MATERIAL SAFETY DATA SHEET

Date : Jan/28/2015
File No.: PH-W5-875

1. Identification of the substance/preparation and of the company/undertaking

Identification of the product

Product name : Lithium Metal Cell
Chemical System: Lithium and Manganese Dioxide (Li-MnO₂ cells)
Model: Cylindrical and coin Type Cells_
Designated for 'DO NOT RECHARGE'? ☒ Yes ☐ No

Manufacturer/supplier identification

Company : Guangzhou Great Power Energy & Technology Co., Ltd
Contact for information : 922 Xicun Section, Shiliang Road, Shawan, Panyu, Guangzhou, GD, PRC
Emergency telephone No. : 0086-20-39196888

2. Composition/information on ingredients

Ingredient	Percent	CAS Index No./EC No.	Molar mass	Molecular formula	Symbol
Manganese Dioxide	33%	1313-13-9		MnO ₂	
Lithium	2.4%	7439-93-2		Li	
Propylene carbonate	6.25%	108-32-7		PC	
Dimethyl ether	6.25%	115-10-6		DME	
Lithium Perchlorate	1.4%	7791-03-9		LiClO ₄	
Polypropylene	2.1%	9003-07-0		PP	
Steel	47.2%	7439-89-6		Fe	
Aluminum	1.4%	7429-90-5		Al	

Remark: The weight of metallic lithium per cell is <0.3 g.

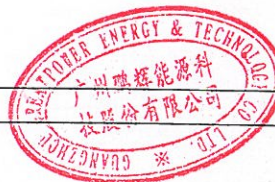
3. Hazards identification

Routes of Entry:

Inhalation - Yes
Skin - Yes
Ingestion - Yes

Health Hazards (Acute and Chronic):

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically



abused. The most likely risk is an acute exposure when the gas release vent works. Organic solvent has slight toxicity and can irritate skin and eyes. Lithium salt is irritating to skin, eyes and mucous membranes and should be avoided.

Carcinogenicity:

NTP: None IARC Monograph: None OSHA Regulated: None

Medical Conditions Generally Aggravated by Exposure:

An acute exposure will not generally aggravate any medical condition.

4. First aid measures

After skin contact :	In case of skin contact with contents of battery, flush immediately with water. If irritation persists, get medical help.
After eye contact :	For eye contact, flush with copious amounts of water for 15 minutes. Do not inhale leaked material. If irritation persists, get medical help.

5. Fire-fighting measures

Extinguishing Media: CO2 or dry chemicals

Flammable Limits: Not available

6. Accidental release measures

The preferred response is to leave the area and allow the batteries to cool and the vapors to dissipate. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

7. Handling and storage

Avoid mechanical or electrical abuse. Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

8. Exposure controls/personal protection

Specific control parameter :

Personal protective equipment :

Respiratory protection (Specify Type) :	Not necessary under conditions of normal use.
Ventilation:	Not necessary under conditions of normal use.
Protective Gloves:	Not necessary under conditions of normal use.
Eye protection:	Not necessary under conditions of normal use.
Other Protective (Clothing or Equipment):	Not necessary under conditions of normal use.



9. Physical and chemical properties

Specific Gravity: (H₂O=1): MnO₂: 5.03

Melting Point: (°C): MnO₂ decomposes at 535 deg. C

MnO₂ is a black, odorless powder.

Lithium is a soft, silvery metal.

Organic solvent is an odorless, colorless or light yellow liquid.

Lithium salt is a white, crystalline and odorless powder.

10. Stability and reactivity

Stability: Stable

Conditions to Avoid: Do not heat, disassemble or charge.

Hazardous Decomposition or By-products: N/A

Hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity :

Organic solvent

Further toxicological information :

Lithium

12. Ecological information

Ecotoxic effects : N/A

Further ecological data : N/A

13. Disposal considerations

Great Power encourages battery recycling. Our Li-Mn batteries are recyclable through the Rechargeable Battery Recycling Corporation's (RBRC) **Charge Up to Recycle! Program**. For information call 1-800-8-BATTERY or see their website at www.rbrc.org. Li-Mn batteries must be handled in accordance with all applicable state and federal laws and regulations.

DO NOT RECHARGE, disassemble, short, or subject battery cells to temperatures in excess of 212 F. Do not use in combination with fresh and used lithium batteries neither with other type of battery.

14. Transport information

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in "strong outer packaging" that prevents spillage of contents. All original

packaging for Great Power lithium batteries are compliant with these regulatory concerns.

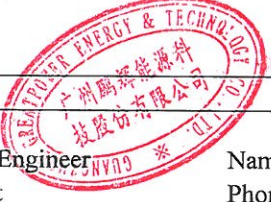
Great Power lithium manganese dioxide batteries are exempt from the classification as dangerous goods as they meet the requirements of the special provisions listed below. ((Essentially, they accord with 56th DGR and are properly packaged and labeled. Great Power Lithium batteries contain less than 0.3 gram of lithium and pass the tests defined in UN model regulation section 38.3).

International transport regulations	Special Provisions
ADR	188, 230, 310, 636, 656
IMDG	188, 230, 310, 957
UN	UN 3090, UN 3091
US DOT	29, A54, A100, A101
IATA, ICAO	Packaging Instructions 968 - 970 Section II

15. Regulatory information

N/A

16. Other information

Make people :	Professional post : R&D Engineer		
Make unit :	Name : R&D Department		Name(sign) : Jack Wu
	Address : R&D Dept., Panyu Plant.,		Phone : 0086-20-39196888

Date of issue : 2015/01/28

DISCLAIMER : **The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Guangzhou Great Power Energy & Technology Co. Ltd makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.**



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空运 By Air

报告编号(Report ID): H03213027411D

锂电池

符合相关包装说明第 II 部分

货物运输测试报告

Cargo Transportation Test Report

样品名称	PH00210 锂锰电池 CR2
(Samples)	PH00210 Lithium Battery CR2
委托单位	广州鹏辉能源科技股份有限公司
(Client)	Guangzhou Great Power Energy & Technology Co., Ltd.
生产单位	广州鹏辉能源科技股份有限公司
(Manufacturer)	Guangzhou Great Power Energy & Technology Co., Ltd.

P O N Y 谱尼测试
Pony Testing International Group
www.ponytest.com

No.: H03213027411D
Code: x1hqxqbv9



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货物运输测试报告

Cargo Transportation Test Report

样品名称 Name & Model	PH00210 锂锰电池 CR2		
	PH00210 Lithium Battery CR2		
委托单位 Applicant	广州鹏辉能源科技股份有限公司		
	Guangzhou Great Power Energy & Technology Co., Ltd.		
公司地址 Address	广东省番禺区沙湾镇市良路西村段 912 号		
	No. 912, West Village Segment, Shiliang Road, Shawan Town, Panyu, Guangdong Province, P.R. China.		
样品外观及性状 Appearance & Odor	蓝色电池, 标称电压为 3.0V, 额定电容量为 750mAh. Blue battery. Nominal voltage is 3.0V, Rated capacity is 750mAh.		
货物主要危险性 Main Hazards	化学物质包含在密封电池外壳内。当电池机械破损时会产生危害。遇火会引起爆炸。 These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. If in fire, battery may cause to explode.		
接样日期 Accepting Date	2013 年 3 月 17 日	签发日期 Issue Date	2013 年 4 月 7 日
测试结果(Conclusion)			
1、危险性识别(Hazard identification): ①锂含量=0.25g, 包装件重量=0.12kg, 内含电池数量=8 个。 ②经测试证明其符合《关于危险货物运输的建议书-试验和标准手册》第 3 部分 38.3 款的所有要求。 ③经测试证明其通过 1.2 米的跌落试验。 ④电池被保护以防止短路, 电池必须要放在完全封闭的内包装中, 然后再放在坚固的外包装内。 需满足 DGR5.0.2 章节的包装要求。 ⑤任一包装件都必须粘贴有锂电池操作标签。			



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⑥每批货物必须附有随机文件，文件内容包括内含锂电池、小心搬运、包装件受损时应遵循的特别程序、电话等信息。

⑦禁止运输从安全角度有缺陷的锂电池。

⑧禁止运输废旧锂电池或用于再循环处理的锂电池。

⑨电池要按照质量管理程序 3.9.2.6 (e) 中的描述来制造。

⑩一个外包装上必须标有“外包装”的字样和贴有锂电池标签，除非外包装内的包装上的标签是清晰可见的。

①Lithium Content=0.25g, Q'ty =0.12kg, contain 8pcs batteries.

②Test proves that this type of battery pass the UN38.3 test.

③Test proves that this type of battery pass the 1.2m drop test.

④Cells and batteries are protected so as to prevent short circuits. Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packing.

The General Packing Requirements of 5.0.2 must be met.

⑤Each package must be labeled with a "lithium battery handling label".

⑥Each consignment must be accompanied with a document with an indication including packed with lithium batteries, handled with care, special procedures should be followed in the event that the package is damaged, a telephone number etc.

⑦Lithium batteries as being defective for safety reasons are forbidden for transport.

⑧Waste lithium batteries and lithium batteries being shipped for recycling or disposal are prohibited from air transport.

⑨Cell and batteries must be manufactured under a quality management program as described in 3.9.2.6(e).

⑩An overpack must be marked with the word "overpack" and labeled with the lithium battery label unless the label(s) on the package(s) inside the overpack are visible.

2、建议比照办理的类型和编号(Suggestion according to DGR):

可按 DGR 包装说明 968 第 2 部分条件办理。

According to the packaging instruction 968 Section II of DGR.



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3、包装要求(Packaging requirements):

内容 Contents	电芯或电池≤0.3g Cells/Batteries≤0.3g	0.3g<电芯≤1g 0.3g< Cells≤1g	0.3g<电池≤2g 0.3g< Batteries≤2g
最大数量/包装件 Max number cells/batteries per package	无限制 No limit	8 个电芯 8 Cells	2 个电池 2 Batteries
最大净重/包装件 Max net quantity per package	2.5kg	N/A	N/A

参照 DGR 包装说明 968 第 2 部分。

The goods are packaged according to the packaging instruction 968 Section II of DGR.

参考方法 Reference method	1) 《联合国关于危险品运输建议书——规章范本》(17 th); 2) IATA 《危险品规则》(54 th); 3) 该物质的 UN38.3 报告 (H03213027221D~1); 4) 跌落试验报告 (H03213027321D~1). 1) <<Recommendations On The Transport Of Dangerous Goods-Model Regulations>>(17 th); 2) IATA<<Dangerous Goods Regulation>> (54 th); 3) The UN38.3 test report (H03213027221D~1); 4) The drop test report (H03213027321D~1).
备注 Remark	适用于空运。 Be applicable to transport by air. 关于一次性锂电池的航空运输中国民航总局及各承运人可能会存在一些特殊规定。 Civil Aviation Administration of China and carrier may execute some special prescribe for the primary lithium cell or battery.

主检人 : 夏非虹 审核人 : 汪志敏 批准人 : 李松

(Prepared by) (Checked by) (Approved by)

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试验项目和名称 Name Of Test Items	试验结果 Test Result
高度模拟 Altitude simulation (38.3 test 1)	无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。试验符合标准要求。 No mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The test result conforms to the requirement of standard.
温度试验 Thermal test (38.3 test 2)	无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。试验符合标准要求。 No mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The test result conforms to the requirement of standard.
振动 Vibration (38.3 test 3)	无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。试验符合标准要求。 No mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The test result conforms to the requirement of standard.
冲击 Shock (38.3 test 4)	无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组在试验后的开路电压不小于其在进行这一试验前电压的 90%。试验符合标准要求。 No mass loss, no leakage, no venting, no disassembly, no rupture and no fire. The open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The test result conforms to the requirement of standard.
外部短路 External short circuit (38.3 test 5)	外壳温度不超过 170℃, 并且在试验过程中及试验后 6 小时内无解体, 无破裂, 无起火。试验符合标准要求。 The external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test. The test result conforms to the requirement of standard.
挤压 Crush (38.3 test 6)	外壳温度不超过 170℃, 并且在试验过程中及试验后 6 小时内无解体, 无破裂, 无起火。试验符合标准要求。 The external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test. The test result conforms to the requirement of standard.
过度充电 Overcharge (38.3 test 7)	---
强制放电 Forced discharge (38.3 test 8)	在试验过程中和试验后 7 天内无解体, 无起火。试验符合标准要求。 There is no disassembly and no fire during the test and within seven days after the test. The test result conforms to the requirement of standard.
1.2m 跌落测试 1.2m Drop Test	该包装件能够承受 1.2 米跌落试验, 其内装的电池没有受损, 没有造成内装物移动, 以致电池与电池互相接触, 并且没有内装物释出。试验符合标准要求。(PI968) The package is capable of withstanding a 1.2m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery contact and without release of contents. The test result conforms to the requirement of standard. (PI968)



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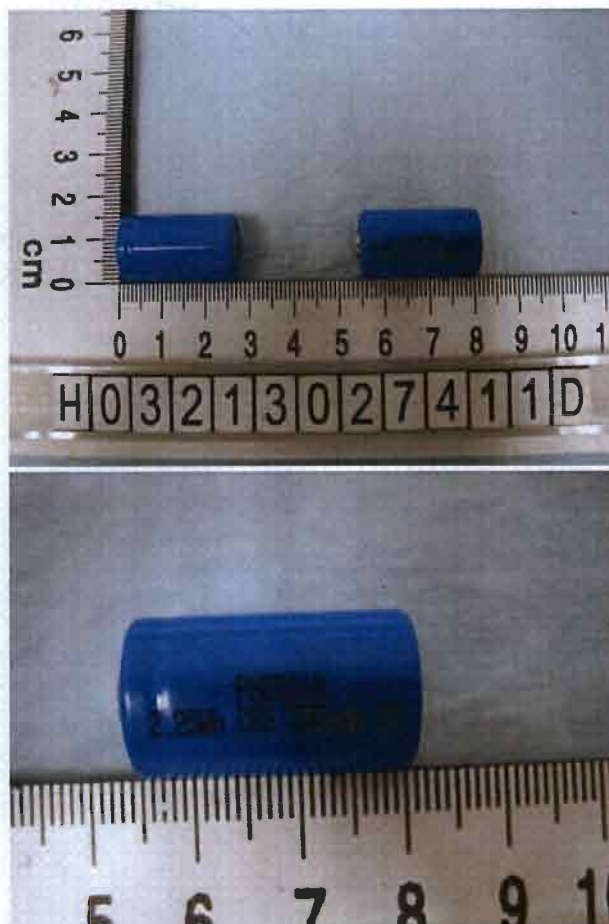
Cargo Transportation Test Report

项目 Item	测试结果 Conclusion
爆炸危险性 Explosive Danger	资料和成份结构显示不属于爆炸品。 The data and components structure indicate the article does not belong to explosive.
易燃危险性 Flammable Danger	不属于易燃类物质。 It does not belong to flammability substance.
氧化危险性 Oxidizing Danger	不能加速纤维素的燃烧, 不属于氧化性物质。 The screening tests indicate the article does not belong to oxidizing solid because it can not make fibrin accelerate burning rate.
毒害危险性 Toxic Danger	口服毒性小, 不属于毒性物质。 The oral toxicity is low, so it does not belong to toxic article.
放射危险性 Radioactive Danger	资料显示无放射性危害。 The data indicates the article has no radioactivity.
腐蚀危险性 Corrosive Danger	对碳钢、铝金属无腐蚀性, 不属于腐蚀性物质。 The article can not corrupt steel, aluminum, so it has no corrosive.
其它危险性 Other Danger	正常使用下, 无刺激性、麻醉性及其它危险性。 In normal situation, no narcotic, irritating and other hazards.



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