



文件標題: SDS of GP Lithium-ion rechargeable cells

客戶名稱:

文件編號: WI-RD-P03-158

修訂編號: 21 (zhen) 第 1 頁 共 14 頁



本文件的制訂及批核

前言

- 本管制文件的制訂及批核須經由指定人員執行。
- 授權批核人授權及負責對本文件進行修訂。

限制權限文件:

制訂及驗證

文件制作人: 任現文 制作 2017/12/28  
 職位: 工程師 日期及時間: 01:05:49 PM  
 本文件批核

授權批核: 周如心 批核 2017/12/28  
 職位: 高級經理 日期及時間: 15:58:31

申請 / 更改文件表

1.) 文件類型 <input type="radio"/> 新文件 <input checked="" type="radio"/> 修改 <input type="radio"/> 撤消 <input type="radio"/> 增發		2.) 類別 <input type="radio"/> 手冊 (一/二級文件) <input type="radio"/> 程序 (一/二級文件) <input checked="" type="radio"/> 工作指導書等 (三級文件) <input type="radio"/> 原材料項目編號 (四級文件) <input type="radio"/> 表格 <input type="radio"/> 外來品質文件 <input type="radio"/> 國際標準/法令、法規文件	
3.) 修改或撤消 保留作廢文件嗎? <input checked="" type="radio"/> 不用 <input type="radio"/> 要 請指定修訂號:  改變已作廢文件保留場所嗎? <input type="radio"/> 不用 由文件控制處保留 <input type="radio"/> 是的 請指定場所		4.) 發行 <input checked="" type="checkbox"/> 受控文件 分發組別數目: 2 <input type="checkbox"/> 非受控文件 分發組別數目:  5.) 改變原稿保留場所 <input type="radio"/> 不 由文件控制處保存 <input type="radio"/> 是	
6.) 申請原因/更改內容			
版本	申請原因/更改內容	制定/修訂人	生效日期
C5	Normal; Amend Section I, II, III, XIV	任現文	2017.12.27
A0	新文件發行	溫鎮波	2013.01.13
A1	加鋰鐵型號	周如心	2013.01.21
A2	精縮電池類型	周如心	2013.04.01
A3	Add the IIb model list	周如心	2013.04.19
7.) 來源檔案/物件媒體 <input type="checkbox"/> 軟媒體 附於以右邊白位置  WI-RD-P03-158 SDS of GP Lithium-ion rechargeable cells C5.pdf <input type="checkbox"/> 硬媒體 請指定安放場所			

# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 2 of 14

Under normal conditions of use, the battery is hermetically sealed, NOT considered hazardous. Stated from the official reply of U.S. Department of Labor, Lithium -ion batteries have the potential to leak, spill, or break, cannot be considered an article that requires Safety Data Sheet. The SDS meets the requirement of the United States Occupational Safety and Health Administration (OSHA) 2012 Hazard Communication Standard 29 CFR 1910.1200.

### Section I – Product and Company Identification

#### Information of Product

Product Identity (As Used on Label and List)	Lithium Ion cell/battery
----------------------------------------------	--------------------------

#### Information of Manufacturer

##### Manufacturer's Name

GPI International Ltd.

##### Emergency Telephone Number

Within USA and Canada: 1-800-424-9300

Outside USA and Canada: +1 703-527-3887

##### Address (Number, Street, City State, and ZIP Code)

7/F, Building 16W,  
16 Science Park West Avenue  
Hong Kong Science Park,  
New Territories, Hong Kong

##### Telephone Number for Information

852-2484-3333

##### Date of prepared and revision

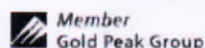
01<sup>st</sup> Jan, 2018 RC5

#### Recommended use of the chemicals:

Don't directly connect (+) and (-) of a battery to make a short circuit. Don't disassemble, heat or put the battery into fire.

### Section II – Hazards Identification

Remark: "N.A. is indicated if not applicable



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# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 3 of 14

### Classification:

- i) **Under normal conditions of use**, the battery is hermetically sealed, NOT considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). It does not pose a physical hazard or health risk.
- ii) **In considering the potential to leak, spill, or break**, if the electrolyte inside is leaked, hazardous material may be released and classified as following hazards.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 1A
Reproductive toxicity	Category 2

### GHS Label elements, including precautionary statements:

- i) **Under normal conditions of use**, the battery is hermetically sealed, no hazards are available.

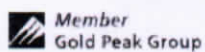
GHS Label: Not applicable with normal use.

IATA Label:

Accept combination use of either previous and new labels.

<i>Class 9 DG Label</i> <i>Used until 31 December 2018.</i>	<i>Lithium Ion Battery Handling Label</i> <i>Used until 31 December 2018.</i>
<i>Class 9 Lithium Batteries DG Label</i>	<i>Lithium Battery Mark</i>

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# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 4 of 14

- ii) In considering the potential to leak, spill, or break, if the electrolyte inside is leaked, hazardous material may be released and the following is for emergency overview.

### Labels



**Signal word** Danger

### Hazard Statements

Harmful if swallowed

Cause skin irritation

May cause an allergic skin reaction

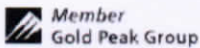
Causes serious eye irritation

May cause cancer

May cause damage to organs through prolonged or repeated exposure

May explode if heated

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# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 5 of 14

### Precautionary Statements

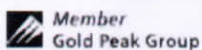
- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Do not breathe dust/fume/gas/mist/vapours/spray
- Avoid breathing breathe dust/fume/gas/mist/vapours/spray
- Wash hands thoroughly after handling
- Do not eat, drink or smoke when using this product

- Response** Refer to Section IV – First-aid Measures
- Storage** Refer to Section VII – Handling and Storage
- Disposal** The battery cell remains in the environment. Do not throw it out into the environment.  
Disposal of contents/container in accordance with local regulation.
- Specific Hazards** Not available

### Section III – Composition/Information on Ingredients

Material/Ingredients	CAS #	Approximate % of total weight
Aluminum	7429-90-5	3-6%
Carbon	7440-44-0	15-30%
Copper	7440-50-8	7-13%
Lithium Cobaltate (LiCoO <sub>2</sub> )	12190-79-3	0-45%
Lithium Manganate (LiMn <sub>2</sub> O <sub>4</sub> )	12057-17-9	0-20%
Lithium Iron Phosphate	15365-14-7	0-55%
Polyvinylidene fluoride (PVDF)	24937-79-9	0.1-5%
Carboxymethyl cellulose (CMC)	9004-32-4	0.1-5%
Nickel	7440-02-0	0.1-10%
Ethyl methyl carbonate	96-49-1	1-10%
Dimethyl carbonate	616-38-6	1-15%
Ethylene carbonate	623-53-0	1-10%
1,3-propanesulfone	1120-71-4	0-0.5%

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# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 6 of 14

### Section IV – First-aid Measures

Inhalation	If electrolyte vapors are inhaled, remove from exposure and provide fresh air, seek medical attention if respiratory irritation develops. Ventilate the contaminated area.
Skin Contact	If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately. Remove contaminated clothing and wash before reuse. In severe cases obtain medical attention.
Eye Contact	If electrolyte comes into contact with eyes, wash with copious amounts of water for fifteen (15) minutes, and contact a physician.
Ingestion	Wash out mouth thoroughly with water and give plenty of water to drink. Obtain medical attention.

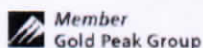
### Section V – Fire-fighting Measures

Extinguishing Media	Carbon Dioxide, Dry Chemical or Foam extinguishers can be used for battery BUT water extinguisher is not suitable.
Unusual Fire and Explosion Hazards	In case of fire, it is permissible to use Carbon Dioxide, Dry Chemical or Foam extinguishers on these cells or their packing material. Cool exterior of cells if exposed to fire to prevent rupture.
Special Protective equipment and Precautions for fire-fighters	Fire fighters should wear self-contained breathing apparatus.

### Section VI – Accidental Release Measures

Personal Precautions, protective equipment, emergency procedures	Cells that are leakage should be handled with rubber gloves. Avoid direct contact with electrolyte. Wear protective clothing. Remove personnel from area until fumes dissipate. If the skin has come into
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# GP Batteries

## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 7 of 14



	contact with the electrolyte, it should be washed thoroughly with water.
<b>Containment and Clean Up</b>	Sand or earth should be used to absorb any exuded material. Seal leaking battery and contaminated absorbent material in plastic bag and dispose of as Special Waste in accordance with local regulations.

### Section VII – Handling and Storage

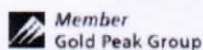
<b>Precautions for Safe Handling</b>	Do not expose the battery to excessive physical shock or vibration. Short-circuiting should be avoided, however, accidental short-circuiting for a few seconds will not seriously affect the battery. Prolonged short circuits will cause the battery to rapidly lose energy, could generate enough heat to burn skin, and may cause the safety release vents of the enclosed cells to open. Sources of short circuits include jumbled batteries in bulk containers, coins, metal jewelry, metal covered tables, or metal belts used for assembly of batteries in devices. To minimize risk of short-circuiting, the protective case supplied with the battery should be used to cover the terminals when transporting or storing the battery. Do not disassemble or deform the battery. Should an individual cell within a battery become ruptured, do not allow contact with water.
<b>Conditions for Safe Storage</b>	Keep cells between -20°C and 35°C for prolong storage. When the cells are closed to fully charged, the storage temperature should be between -20°C and 30°C and should be controlled at 10-20°C during transportation and packed with efficient air ventilation. Do not store in disorderly fashion, or allow metal objects to be mixed with stored cells.

### Section VIII – Exposure Controls/Personal Protection

**Exposure Control Limit** - Only for reference when electrolyte is leaked.

Common Chemical Name / General Name	OSHA PEL	ACGIH TLV
Aluminum metal (as Al)	TWA 15 mg/m <sup>3</sup> (total) TWA 5 mg/m <sup>3</sup> (resp)	-

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# GP Batteries

## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 8 of 14

Cobalt metal (As Co)	TWA 0.1 mg/m <sup>3</sup>	TWA 0.02 mg/m <sup>3</sup>
Carbon (Artificial graphite)	15mg/m <sup>3</sup> (total) 5mg/m <sup>3</sup> (respirable)	-
Manganese compounds (as Mn)	(Ceiling) 5 mg/m <sup>3</sup>	TWA 0.02 mg/m <sup>3</sup> (resp.)
Nickel, metal and insoluble compounds	(as Ni) TWA 1 mg/m <sup>3</sup>	Elemental: 1.5mg/m <sup>3</sup> (IHL); Insoluble inorganic compounds: 0.2mg/m <sup>3</sup> (IHL)
Copper	0.2mg/m <sup>3</sup> (fume) 1.0mg/m <sup>3</sup> (a coarse particulate, mist)	-
Organic electrolyte	-	-

TWA – Time Weighted Average

ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Value

OSHA PEL: Occupational Safety & Health Administration Permissible Exposure Limit

### Personal protective equipment

Required when electrolyte is leaked.

Respiratory protection: Protective mask

Hand protection: Protective gloves

Eye protection: Protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

### Engineering Control

No engineering measure is necessary during normal use. In case of internal leakage of cell materials, operate the local exhaust or enhance ventilation

The contents of cell are hermetically sealed.

## Section IX – Physical and Chemical Properties

### Appearance

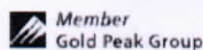
Cylindrical or prismatic shape

### Odor

Odorless

### Odor Threshold

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Document Number: WI-RD-P03-158

Revision: C5

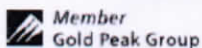
Page 9 of 14

	N.A.
pH	Melting point/freezing point
N.A.	N.A.
Initial boiling point and boiling range	Flash point
N.A.	N.A.
Evaporation rate	Flammability (solid, gas)
N.A.	N.A.
	Upper/lower flammability or explosive limits
	N.A.
Vapor pressure	Vapor density
N.A.	N.A.
Relative density	Solubility
N.A.	N.A.
Partition coefficient: n-octanol/water	Auto-ignition temperature
N.A.	N.A.
Decomposition temperature	Viscosity
N.A.	N.A.

### Section X – Stability and Reactivity

Reactivity	N.A.
Chemical stability	Stable under normal use
Possibility of hazardous reactions	By misuse of a battery cell or the like, gas accumulates in the cell and the internal pressure rises. These gases may be emitted through the gas release vent. When fire is near, these gases may take fire.  When a battery cell is heated strongly by the surrounding fire, acrid or harmful fume may be emitted.
Conditions to avoid	Direct sunlight, high temperature and high humidity

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# GP Batteries



## Safety Data Sheet for GP Lithium ion rechargeable cells/batteries

Document Number: WI-RD-P03-158

Revision: C5

Page 10 of 14

Materials to avoid	Conductive materials, water, seawater, strong oxidizers and strong acids
Hazardous decomposition products	Acid or harmful fume is emitted during fire.

### Section XI – Toxicological Information

#### Route of Entry

Inhalation	N.A.
Skin	N.A.
Ingestion	Ingestion of a battery can be harmful.

#### Health Hazard (Acute and Chronic) / Toxicological Information

There is no toxicity data for Battery. The battery is nontoxic because the chemical mixture from battery is sealed by the metal container.

In case of electrolyte leakage, skin will be itchy when contaminated with electrolyte.

In contact with electrolyte can cause severe irritation and chemical burns.

Inhalation of electrolyte vapors may cause irritation of the upper respiratory tract and lungs.

### Section XII – Ecological Information

Persistence/degradability :

Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

### Section XIII – Disposal Considerations

Recommended methods for safe and environmentally preferred disposal :

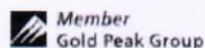
#### Product (waste from residues)

Do not throw out a used battery cell. Recycle it through the recycling company.

#### Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates them, dispose them as industrial wastes subject to special control.

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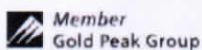
Revision: C5

Page 11 of 14

### Section XIV – Transport Information

<b>UN Number:</b> UN3480						
<b>UN Proper Shipping Name:</b> Lithium ion batteries						
<b>UN:</b> The Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries						
Shipping mode	Regulation	Packing Group/Special Provision	Limit of Wh	Transport Hazard Class	Environmental Hazards	Special Precautions
USA	US DOT 49 CFR Section 173-185 Lithium batteries and cells		>20Wh(cell) >100Wh(battery)	Dangerous goods, Class 9	No marine pollutant	Lithium handling label needed
			<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	No marine pollutant	Lithium handling label needed
Air	ICAO/IATA DGR 59 <sup>th</sup> edition	- PI965 Section IA	>20Wh (cell) >100Wh (battery)	Dangerous goods, Class 9	No marine pollutant	DG Label, CAO Label needed
		- PI 965 Section IB	<=2.7, 2.7 to 20Wh (Cell); <=2.7, 2.7 to 100Wh (battery) (for that exceed allowance in Section II)			Lithium handling label, DG label, CAO label needed
		- PI 965 Section II	<=2.7, 2.7 to 20Wh (Cell); <=2.7, 2.7 to 100Wh (battery) (Only allow one package prepared per consignment)	Partially-regulated dangerous goods	No marine pollutant	Lithium handling label, CAO Label needed.
Sea	IMO/IMDG CODE 38-16	P903 SP188	>20Wh(cell) >100Wh(battery)	Dangerous goods, Class 9	No marine pollutant	Lithium handling label needed
			<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	No marine pollutant	Lithium handling label needed
Road/Rail	ADR/RID	P903 P903a P903b	>20Wh(cell) >100Wh(battery)	Dangerous goods, Class 9	No marine pollutant	Lithium handling label needed
			<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	No marine pollutant	Lithium handling label needed

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Document Number: WI-RD-P03-158

Revision: C5

Page 12 of 14

a) 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 GP Lithium ion batteries (sometimes referred to as "Lithium ion battery") has been designed to be compliant with these regulatory concerns.

Rechargeable lithium ion batteries (UN 3480), are forbidden for transportation aboard passenger-carrying aircraft. Such batteries transported in accordance with Section IA, IB & II of Packing Instruction 968 must be labeled with the CARGO AIRCRAFT ONLY label. Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.

b) International Maritime Organization (IMO) IMDG Code regulated these products as UN 3480, Lithium ion batteries, Class 9 dangerous goods with Special Provision 188 and Packing Instruction 903 assigned.

The watt-hour of the models can be referred to the appendix (Model list – WI-RD-P03-164).

Transport of Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment have to follow the appropriate regulations for UN3481. [PI967, PI966 should be followed accordingly for Air Transport.](#)

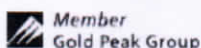
### Section XV – Regulatory Information

Special requirement be according to the local regulations.

### Section XVI – Other Information

The data in this Safety Data Sheet relates only to the specific material designated herein. However, the data is provided without any warranty; expressed or implied, regarding its correctness or accuracy. It is the user's responsibility to assume liability on loss, injury, damage, or expense resulting from improper use of this product. Any previous MSDS of this product mentioned above are hereby replaced with this new document. We urge you to make this information available as appropriate in your organization and to any others with whom you arrange to handle this product.

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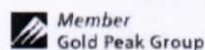
Revision: C5

Page 13 of 14

### 文件履歷表

版次	制定/修訂內容	制定/修訂頁次	制定/修訂日期
A0	初版發行	N	2013.01.13
A1	加鋰電型號	P6	2013.01.21
A2	精縮電池型號	P6-P8	2013.04.01
A3	Add the IIb model list	P8	2013.04.19
A4	1、 Add the page of history 2、 增加電池型號 XP1015-10S 3、 IATA DGR 54th edition to IATA DGR 55th edition. 4、 IMDG Code 35-10 to IMDG Code 36-12	P6	2013.12.23
A5	精縮電池型號	P7	2014.01.13
A6	Date of prepared and revision 改為 14 <sup>th</sup> Feb,2014	P2	2014.02.14
A7	Date of prepared and revision 改為 20 <sup>th</sup> March,2014	P2	2014.03.20
A8	1、 增加電池型號 ICR18650-26F 2、 Add the IIA model list	P8 P6	2014.05.30
A9	1、 增加電池型号 XP0620-05S/GP0620-05S XP0620-05SN/GP0620-05SN PP0620-05S/PP0620-05SN 2、 Date of prepared and revision 改為 27 <sup>th</sup> Jun,2014	P7 P2	2014.06.27
B0	1、 增加電池型号 GP1012-08S 2、 Section XV 增加 Transportation Information	P7 P5	2014.10.10
B1	1、 0620 電池 Rated voltage 改為 3.8， Watt hour 改為 0.209 2、 修改 GP1012-08S 電池 Rated capacity (Ah) 為 0.08 3、 刪減電池型號	P7-P10	2014.12.04
B2	增加電池型號： GP1048-49S， 修改模板內容	All	2015.01.01
B3	New format	All	2015.1.9
B4	Add model 18650-29HD	P9	2015.1.22
B5	New SDS format	All	2015.02.03
B6	Amend the composition	P2, P3	2015.02.09
B7	Amend models	P10	2015.03.30
B8	Amend Models	P10	2015.05.30
B9	Delete model list	P10	2015.07.30
C0	Amend version of Section XIV	P8	2016.01.05
C1	Amend address of company	P2	2016.02.16

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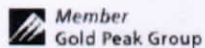
Revision: C5

Page 14 of 14

C2	Amend section III	P2	2016.03.15
C3	Corrected Lithium Iron Phosphate CAS# from 15365-14-17 to 15365-14-7	P3	2016.04.01
C4	Amend Section I, XI, XIV, XVI	P.2, 10-12	2016.12.20
C5	Amend Section I, II, III, XIV	P.2-5, 12	2017.12.20

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