

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 1 of 8

IDENTITY (As Used on Label and List) Lithium Ion cell	Note: Blank spaces are not permitted if any item is not applicable or no information is available, the space must be marked to indicate that.
<b>Section I – Information of Manufacturer</b>	
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)  8/F GP Building, 30 Kwai Wing Road, Kwai Chung, N.T. H.K.	Telephone Number for information  852-2484-3333
	Date of prepared and revision  17 Jan, 2013

## Section II – Ingredients / Identity Information

### Chemistry: Lithium Cobalt oxide

Description:	CAS#	Approximate % of total weight
Aluminum	7429-90-5	3-6%
Artificial Graphite	7740-44-0	10-20%
Copper	7440-50-8	7-10%
Iron	7439-89-6	0-25%
Lithium Cobaltate (LiCoO <sub>2</sub> )	12190-79-3	35-55%
Organic electrolyte	N.A.	10-20%

### Chemistry: Lithium mixed oxide

Description:	CAS#	Approximate % of total weight
Aluminum	7429-90-5	3-6%
Artificial Graphite	7740-44-0	16-20%
Copper	7440-50-8	7-10%
Iron	7439-89-6	0-25%
Lithium Mixed Metal Oxide (LiMO <sub>2</sub> )	N.A.	30-50%
Lithium Cobaltate (LiCoO <sub>2</sub> )	12190-79-3	0-10%
Lithium Manganate (LiMn <sub>2</sub> O <sub>4</sub> )	12057-17-9	0-10%
Organic electrolyte	N.A.	10-20%

M = One metal or a combination of metals (Co, Mn, Ni or Al)

### Chemistry: Lithium Iron Phosphate

Description:	CAS#	Approximate % of total weight
Aluminum	7429-90-5	3-6%
Artificial Graphite	7740-44-0	10-20%
Copper	7440-50-8	7-10%
Iron	7439-89-6	0-25%
Lithium Iron Phosphate	15365-14-17	35-55%
Organic electrolyte	N.A.	10-20%

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 2 of 8

### Section III – Physical / Chemical Characteristics

Boiling Point N.A.	Specific Gravity (H <sub>2</sub> O=1) N.A.
Vapor Pressure (mm Hg) N.A.	Melting Point N.A.
Vapor Density (AIR=1) N.A.	Evaporation Rate (Butyl Acetate) N.A.
Solubility in Water N.A.	
Appearance and Odor Cylindrical or prismatic shape, odorless	

### Section IV – Hazard Classification

During normal use, no physical danger of ignition or explosion and chemical danger of leakage of hazardous material. In the condition of over-abusive use, the safety vent will open. Hence, hazardous materials may come out.

If the electrolyte reacts with water, it will generate hydrogen fluoride. Do not expose to fire, as the leaked electrolyte is inflammable substance.

### Section V – Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to Avoid)

Hazardous Decomposition or Byproducts

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

### Section VI – Health Hazard Data

Route(s) of	Inhalation?	Skin?	Ingestion?
Entry	N.A.	N.A.	N.A.

Health Hazard (Acute and Chronic) / Toxicological information

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.

In case of electrolyte vapor or splash, eye contact causes inflammation.

### Section VII – First Aid Measures

First Aid Procedures

If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately.

If electrolyte comes into contact with eyes, wash with copious amounts of water for fifteen (15) minutes, and contact a physician.

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 3 of 8

If electrolyte vapors are inhaled, provide fresh air and seek medical attention if respiratory irritation develops. Ventilate the contaminated area.

### Section VIII – Fire and Explosion Hazard Data

Flash Point (Method Used)	Ignition Temp.	Flammable Limits	LEL	UEL
N.A.	N.A.	N.A.	N.A.	N.A.

#### Extinguishing Media

Carbon Dioxide, Dry Chemical or Foam extinguishers can be used for battery BUT water extinguisher is not suitable.

#### Special Fire Fighting Procedures

N.A.

#### Unusual Fire and Explosion Hazards

Do not dispose of battery in fire - may explode.

Do not short-circuit battery - may cause burns.

### Section IX – Measures for fire extinction

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. Fire fighters should wear self-contained breathing apparatus.

### Section X – Accidental Release or Spillage

#### Steps to Be Taken in Case Material is Released or Spilled

Cells that are leakage should be handled with rubber gloves.

Avoid direct contact with electrolyte.

Wear protective clothing.

### Section XI – Handling and Storage

#### Safe handling and storage advice

Cells should be handled and stored carefully to avoid short circuits.

Do not store in disorderly fashion, or allow metal objects to be mixed with stored cells.

Never disassemble a battery.

Do not breathe cell vapors or touch internal material with bare hands.

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.

### Section XII – Exposure Controls / Personal Protection

#### Engineering measures:

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

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 4 of 8

Control parameters:

Common chemical name / General name	ACGIH (2002)	
	TLV-TWA	BEI
Aluminum	10mg/m <sup>3</sup> (metal coarse particulate) 5mg/m <sup>3</sup> (flammable powder) 5mg/m <sup>3</sup> (weld fume)	N.A.
Carbon (Artificial graphite)	2mg/m <sup>3</sup> (inhalant coarse particulate)	N.A.
Copper	0.2mg/m <sup>3</sup> (fume) 1.0mg/m <sup>3</sup> (a coarse particulate, mist)	N.A.
Lithium cobaltate (LiCoO <sub>2</sub> )	0.02mg/m <sup>3</sup> (as cobalt)	N.A.
Organic electrolyte	N.A.	N.A.

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value – Time Weighted Average concentration

BEI: Biological Exposure Indices

Personal protective equipment:

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

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

### Section XIII – Ecological Information

Do not bury or throw out into the environment as a cell and the internal materials remain in the environment.

### Section XIV – Disposal Method

Dispose of cells according to government regulations.

### Section XV – Transportation Information

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 5 of 8

All GP lithium-ion cells/batteries shown in this MSDS comply to the necessary requirements under the UN Recommendations on the Transport of Dangerous Goods Model Regulations and UN Manual of Tests and Criteria as referenced in the following transportation regulations:

The unit Wh is equal to Rated capacity (Ah) x Nominal voltage (V).

UN No.	Shipping modes	Regulations	Packing instructions	Limit of Wh	Classification	Lithium handling label	Class 9 DG label
UN3480	USA	US Department of Transportation of Hazardous Substances (HMR)		<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	Needed	Not necessary
	Air	ICAO/IATA DGR 54th edition	PI965 Section II	IIa: <=2.7Wh IIb: >2.7 to <=20Wh (<=8 cells) (Cell)  IIa: <=2.7Wh IIb: >2.7 to <=100Wh (<=2 batteries) (Battery)	Non-dangerous goods	Needed	Not necessary
	Sea	IMO/IMDG	P903	<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	Needed	Not necessary
	Road/Rail	ADR / RID	P903 P903a P903b	<=20Wh(cell) <=100Wh(battery)	Non-dangerous goods	Needed	Not necessary

### Section XVI – Regulatory Information

Special requirement be according to the local regulatories.

### Section XVII – Other Information

The data in this Material Safety Data Sheet relates only to the specific material designated herein.

### WATT-HOUR FOR LITHIUM ION BATTERY

Chemistry	Model	Rated capacity (Ah)	Rated voltage (V)	Watt hour (Wh)
Lithium Cobalt oxide	GP0820L07	0.075	3.7	0.278
	GP0825L11	0.110	3.7	0.407
	GP0828L12	0.125	3.7	0.463
	GP0836L15	0.155	3.7	0.574
	GP0836L17	0.170	3.7	0.629
	GP0840L18	0.180	3.7	0.666
	GP1015L08	0.085	3.7	0.315
	GP1018L10	0.105	3.7	0.389
	GP1022L15	0.155	3.7	0.574

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 6 of 8

Lithium Cobalt oxide	GP1029L20	0.205	3.7	0.759
	GP1043L36	0.360	3.7	1.332
	GP1051L35	0.355	3.7	1.314
	GP1229L30	0.325	3.7	1.203
	GP1443L68	0.680	3.7	2.516
	GP1450L85	0.850	3.7	3.145
	GP1465L115	1.150	3.7	4.255
	GP1750L125	1.250	3.7	4.625
	GP1767L185	1.850	3.7	6.845
	GP1850L140	1.400	3.7	5.180
	GP1865L220	2.200	3.7	8.140
	GP1450L85	0.850	3.7	3.145
	GP1465L115	1.150	3.7	4.255
	GP1750L125	1.250	3.7	4.625
	GP1767L185	1.850	3.7	6.845
	GP1850L140	1.400	3.7	5.180
	GP1865L220	2.200	3.7	8.140
	GP413048L68	0.680	3.7	2.516
	GP413443L63	0.630	3.7	2.331
	GP413450L78	0.780	3.7	2.886
	GP503020L21	0.210	3.7	0.777
	GP503040L54	0.540	3.7	1.998
	GP503048L78	0.780	3.7	2.886
	GP503436L60R	0.600	3.7	2.220
	GP503449L98R	0.980	3.7	3.626
	GP563136L72R	0.720	3.7	2.664
	GP603450L114R	1.140	3.7	4.218
	GP603465L144	1.440	3.7	5.328
	GP623040L74	0.740	3.7	2.738
	GP623048L104	1.040	3.7	3.848
	GP743442L118R	1.180	3.7	4.366
	GP813433L75	0.750	3.7	2.775
	GP813448L137	1.370	3.7	5.069
	GP843042L105	1.050	3.7	3.885
	GP863734L120R	1.200	3.7	4.440

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 7 of 8

Lithium Cobalt oxide	GP103450L180R	1.850	3.7	6.845
	GP413450L78	0.780	3.7	2.886
	GP503048L78	0.780	3.7	2.886
	GP503449L98R	0.980	3.7	3.626
	GP603450L114R	1.140	3.7	4.218
	GP603465L144	1.440	3.7	5.328
	GP623040L74	0.740	3.7	2.738
	GP623048L104	1.040	3.7	3.848
	GP743442L118R	1.180	3.7	4.366
	GP813433L75	0.750	3.7	2.775
	GP813448L137	1.370	3.7	5.069
	GP843042L105	1.050	3.7	3.885
	GP863734L120R	1.200	3.7	4.440
	GP103450L180R	1.850	3.7	6.845
	DLP333450	0.52	3.7	1.924
	DLP391230	0.105	3.7	0.3885
	DLP413239	0.465	3.7	1.7205
	DLP491538	0.23	3.7	0.851
	DLP521630	0.24	3.7	0.888
	DLP611235	0.2	3.7	0.74
	DLP381225	0.08	3.7	0.296
	DLP412023	0.13	3.7	0.481
	DLP521630	0.24	3.7	0.888
	DLP392339	0.275	3.7	1.0175
	DLP513040	0.56	3.7	2.072
	DLP983450	1.85	3.7	6.845
	DLP604050	1.14	3.7	4.218
	GP413450L78	0.780	3.7	2.886
	GP503048L78	0.780	3.7	2.886
	GP503449L98R	0.980	3.7	3.626
	GP603450L114R	1.140	3.7	4.218
	GP603465L144	1.440	3.7	5.328
	GP623040L74	0.740	3.7	2.738
	GP623048L104	1.040	3.7	3.848
	GP743442L118R	1.180	3.7	4.366
	GP813433L75	0.750	3.7	2.775
	GP813448L137	1.370	3.7	5.069

# GP Batteries

## Material Safety Data Sheet for GP Lithium-ion rechargeable cells/batteries) Section II

Document Number: WI-RD-P03-158

Revision: 1

Page 8 of 8

Lithium Cobalt oxide	GP843042L105	1.050	3.7	3.885
	GP863734L120R	1.200	3.7	4.440
	GP103450L180R	1.850	3.7	6.845

Chemistry	Model	Rated capacity (Ah)	Rated voltage (V)	Watt hour (Wh)
Lithium mixed oxide	GP18650CH	2.20	3.60	7.92
	GP1865T220	2.20	3.60	7.92
	GP1450L85	0.850	3.7	3.145
	GP1465L115	1.150	3.7	4.255
	GP1750L125	1.250	3.7	4.625
	GP1767L185	1.850	3.7	6.845
	GP1850L140	1.400	3.7	5.180
	GP1865L220	2.200	3.7	8.140
	DLP2999115	3.1	3.7	11.47
	DLP3968100	3	3.7	11.1
	DLP5054105	3.05	3.7	11.285
	DLP535068	2	3.7	7.4
	GP4105054T1000	10.000	3.65	36.5
	GP4105054T1000L	10.000	3.65	36.5
	GP4105054T1400	13.600	3.65	49.6

Chemistry	Model	Rated capacity (Ah)	Rated voltage (V)	Watt hour (Wh)
Lithium Iron Phosphate	GPEV45LF00 GPSEO45LF003	42	3.2	134.4
	GPEV30LF00 GPSEO30LF004	30	3.2	96
	GPEV18LF00 GPSEO18LF002	16	3.2	51.2