The Source of Electric Power
MINAMOTO®
MINAMOTO BATTERY (HK) LTD.
Flat A-6, 8/F., Mai Hing Industrial Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong.
Tel: (852) 2793 4790 Fax: (852) 2793 4932 *E-mail: info@minamoto.com*

MATERIAL SAFETY DATA SHEET

1. Identification

Manufactu

Name of Company	:	MINAMOTO BATTERY (HK) LTD.
Address	:	Flat A-6, 8/F., Mai Hing Ind. Bldg., 16-18 Hing Yip St., 16-18 Hing Yip Street, Kwun Tong, Kowloon, H.K.
Tel	:	27934790
Fax	:	27934932
Ref. No.	:	UH001269
Issued	:	2-Jan-2019

Name of Product	:	**Lithium Manganese Dioxide Battery (Lithium Metal Battery)**
Model	:	**CP405050-P2**
Voltage	:	**3.0V**

Substance	:	Lithium Manganese Dioxide Battery
UN Class	:	Even classified as Lithium Battery, they are exempted from Dangerous Goods. UN-Recommendation on the Transport of Dangerous Goods Model Regulations: (ST/SG/AC.10/1 Rev. II) Lithium cell are not subject to the UN Regulation if they meet the following provisions. The equivalent Lithium content calculated by 0.3 times of the rated capacity in Ampere=hour (Ah) is not more than 1.0g. (1)

2. Composition

Composition	:	Propylene carbonate (PC)	4.1wt%
	:	Manganese dioxide (MnO2)	29wt%
	:	Dimethoxyethane (DME)	6.2wt%
	:	Lithium perchlorate (LICIO4)	0.9wt%
	:	Graphite (C)	3.4wt%
	:	Stainless Steel	50wt%
	:	Plastic (PP)	4.1wt%
	:	Teflon (PTFE)	0.3wt%
	:	Lithium (Li)	1.2wt%
Chemical System	:	MnO2/Li	
Approximate Weight	:	40g	

3. Hazardous and Toxicity Class

Class Name	:	Not applicable for regulated class.
Hazard	:	It may cause heat generation or electrolyte leakage if battery terminates contact with metals, Electrolyte is flammable. In case of electrolyte Leakage, move the battery from fire immediately.
Toxicity	:	Vapor generated from burning batteries, may make Eyes, skin and throat irritate.

4. First Aid Measures

The product contains organic electrolyte, In case of electrolyte leakage from the battery, actions described below are required.

Eye contact	:	Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Take a medical treatment. If appropriate procedures are not taken, this may cause an eye irritation.
Skin contact	:	Wash this contact area off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
Inhalation	:	Remove to fresh air immediately. Taken a medical treatment.

5. Fire Fighting Measures

Flat A-6, 8/F., Mai Hing Industrial Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong.
Tel: (852) 2793 4790 Fax: (852) 2793 4932 *E-mail: info@minamoto.com*

Extinguishing method	:	Since vapor, generated from burning batteries may make eyes, nose and throat irritate, be sure to extinguish the fire on the windward side, Wear the respiratory protection equipment in some cases.
Fire extinguishing agent	:	Dry chemical, alcohol-resistant form, carbon dioxide and plenty of area effective.

6. Measures for electrolyte leakage from battery

- Take up with absorbent.
- Move the battery away from the fire.

7. Handling and storage

7.1 Handling:

- Do not recharge
- Do not use different types and brands of batteries or with different state charge
- Avoid short circuit
- Use desk of work electrically insulated
- Avoid to work over wet surface
- Use plastic caliber to valuate the dimensions of a Lithium battery or to insulate the metallic surface of the battery
- Do not have rings on the fingers; otherwise wear insulating gloves
- Do not cut in the same time both the terminals of a battery: it could be a short circuit trough the shears
- Keep the batteries in non-conductive trays (i.e. plastic, wood or carton)
- Do not solder directly on the battery
- Do not disassemble the batteries, do not throw them in the fire, do not hole, do not overheat or plunge into water

7.2 Storage:

- Store the Lithium cells in a cool, dry and ventilated area far from fires and heating sources.
- It is recommended the use of a non-combustible structure, keep adequate clearance between walls and batteries.
- The maximum temperature suggested for the storage is +35°C
- Be sure not to expose the battery to condensation, water drop or not to store it under frozen condition. Avoid places of high humidity.
- Arrange adequate protections to avoid possible hurts to the batteries
- Keep the batteries in their original packages till when they are used
- Do not expose the batteries directly to the sun light or in front of a heating source such as stove.
- Do not put an higher number of cartons one on another (respect what indicated)
- If possible, store them in a place installed with alarm for smoke and gas

8. Exposure Control (In case of electrolyte leakage from the battery)

Acceptable concentration	:	Not specified in ACGIH (4)
Facilities	:	Provide appropriate ventilation system such as local ventilator in the storage place.
Protective	:	Gas mask for organic gases, safely goggle, Safety gloves.

9. Stability and Reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.
As such, battery performance will deteriorate over time even if stored for a long period of time without being sued. In addition, the various usage conditions such as charge, discharge, ambient temperature etc are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

10. Disposal Considerations (Precautions for recycling)

- When the battery is worn out, dispose of under the ordinance of each local government or the low issued by relating government.
- Disposal of the worn-out battery may be subjected to Collection and Recycling Regulation.

MINAMOTO BATTERY (HK) LTD.
Flat A-6, 8/F., Mai Hing Industrial Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong.
Tel: (852) 2793 4790 Fax: (852) 2793 4932 *E-mail: info@minamoto.com*

11. Ecological information
When properly used or disposed, the lithium manganese dioxide batteries do not present environmental hazard.

12. Disposal consideration
For the disposal apply to specialized organization.

13. Toxological information
The rupture of a lithium-manganese dioxide batteries can developed the following substances:
- Hydrogen (H2), lithium Oxide (Li2O) and lithium Hydroxide (LiOH) in case of reaction of lithium metal with water
- Chlorine (Cl2), sulfur dioxide (SO2) and disulfur dichloride (S2Cl2) if the thionyl chloride goes above 140.5°C
- Hydrochloric acid (HCl) and sulfur dioxide (SO2) in case of reaction of thionyl chloride with water
- Hydrochloric acid (HCl), lithium oxide (Li2O), lithium hydroxide (LiOH) and aluminium hydroxide (Al(OH)3) in case of reaction of lithium thetrachloroaluminate with water.

14. Transport information

UN Dangerous Goods List

UN No.	Name & Description	Class or Dvision	Special Provision	Packing Instruction
3090	Lithium Metal Batteries	9	188 230 310 376 377 384	 P903 P908 P909 P910

Sea Transportation

All lithium metal cells shipping from Minamoto (HK) Ltd. and their packing condition conform to the following regulations and meet the requirements; therefore they can be shipped as exemption from Class 9 Dangerous goods.

Outline of IMO-IMDG Code 2014 SP188

*	For a lithium metal cell, the lithium content is not more than 1g.
*	Each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria 6th revised edition Amendment 2, Part III, subsection 38.3.
*	Cells shall be packed in inner packagings that completely enclose the cell.
*	Each package shall be capable of withstanding a 1.2m drop test in any orientation without damage to cells contained therein, without shifting of the contents so as to allow battery to battery contact and without release of contents.
*	Package shall not exceed 30kg gross mass.
*	The specified information shall be indicated on each package.
*	Each cell shall be manufactured under quality program specified by the United Nations.

Air Transportation

For air transportation, it is necessary to comply with IATA DGR 60th Edition (Dangerous Goods Regulations, 60th Edition)

The Source of Electric Power
MINAMOTO®
MINAMOTO BATTERY (HK) LTD.
Flat A-6, 8/F., Mai Hing Industrial Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong.
Tel: (852) 2793 4790 Fax: (852) 2793 4932 *E-mail: info@minamoto.com*

Dangerous Goods List on IATA DGR

UN No.	Proper Shipping Name/Description	Class or Division	Packing Instruction	Passenger Aircraft	Cargo Aircraft	S.P.
3090	Lithium Metal Batteries	9	PI968 (Section IA)	Forbidden	Max Net Qty /Package 35kg	A88 A99 A154 A164 A183 A201 A206
			PI968 (Section IB)	Forbidden	Max Net Qty /Package 2.5kg	
			PI968 (Section II)	Forbidden	Max Net Qty /Package 2.5kg & Single package for single consignment	

As Minamoto CP405050-P2 battery contains lithium metals less than 1.0g, Packing Instruction 969/970 can be applicable to the products this battery model is assembled into.

When Minamoto CP405050-P2 battery is contained in equipment or packed with equipment, it is classified into UN3091.
CP405050-P2 battery supplied by us meets the battery requirements to be excluded from dangerous goods regulation.

For the details of indication on package and document required for transportation, please refer to IATA DGR 60th Edition (Dangerous Goods Regulations, 60th Edition).

MINAMOTO BATTERY (HK) LTD.
Flat A-6, 8/F., Mai Hing Industrial Building, 16-18 Hing Yip Street, Kwun Tong, Kowloon, Hong Kong.
Tel: (852) 2793 4790 Fax: (852) 2793 4932 *E-mail: info@minamoto.com*

Related regulation, issued documents

*	International Air Transport Association (IATA): Dangerous Goods Regulations, 60th Edition
*	International Civil Aviation Organization (ICAO):Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2017-2018 Edition
*	International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2016 Edition
*	U.S. Department of Transportation (DOT) 49 CFR
*	UN(SP188): UN(United Nations): Recommendations on the Transport of Dangerous Goods: Model Regulations 19th revised edition

15. Regulatory Information

- IATA Dangerous Goods Regulations.
- ICAO Technical Instructions for the safe transport of dangerous goods by air

16. Others

References

1. UN Recommendations on the Transportation of Dangerous Model Regulations (ST/SG/AC.10/1/Rev.11)
2. Federal Register/Vol.66, No. 174/Thursday, September 7,2000/Notice.
3. IATA Dangerous Goods Regulations 42nd Edition Effective 1 January 2001.
4. TLVs and BELs 1999 ACGIH