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SAFETY DATA SHEET (SDS)

SECTION 1: Product and Company Identification

Product Name ML Lithium Rechargeable Battery

Model Name: ML414H (with Tab)
Nominal Voltage: 3 V
Nominal Capacity: 1.0 mAh (3.1 V-2.0 V)

Manufacturer
Seiko Instruments Inc.
Micro-Energy Division
Address: 45-1, Aza Matsubara, Kamiayashi, Aoba-ku, Sendai-shi, Miyagi, Japan
Telephone: +81-22-391-9331 Facsimile: +81-22-391-9330

Seller
Seiko Instruments Inc.
Electronic Components Sales Head Office
Address: 8, Nakase 1-chome, Mihama-ku, Chiba-shi, Chiba, Japan
Telephone: +81-43-211-1735 Facsimile: +81-43-211-8034

Emergency Contact International / call +81-22-391-9331 (Seiko Instruments Inc.)
North America / call +1-800-424-9300（CHEMTREC）

SECTION 2: Hazards Identification

GHS Classification Not applicable

Effects to Human body: When time has passed since battery was swallowed, it might cause inflammation in esophagus, stomach or intestine.

Possibility of Fire ignition: When exposed to fire or extreme heat, it may catch fire, generate heat, liquid leak or it may burst. And the generated steam may cause irritation of throat, eyes and skin.

SECTION 3: Composition/Information on Ingredients

Substance/Preparation/Article Article

Important Note The battery should not be opened or burned, because the following ingredients listed below are contained in it. It may generate gas.

Main Materials and Main Ingredients

Part Name	Material Name	CAS No.	Content(%)
Anode	Lithium-Aluminium alloy	87871-87-2	1 - 10
Cathode	Lithium-Manganese composite oxide	-	1 - 10
Electrolyte	1,2-Diethoxyethane (EGDEE)	629-14-1	1 - 10
	Organic electrolyte	-	1 - 10
Others (Case,Tab etc.)	Nickel plated stainless steel	12597-68-1/7440-02-0	60 - 80
	Plastic	-	1 - 10
	Tin (Surface treatment)	7440-31-5	0.1 - 2

Blanks are trade secret.

SECTION 4: First Aid Measures

If contents leak, observe the following instructions:

Inhalation:	Fumes can cause respiratory irritation. Ensure the person has fresh air and get a medical treatment immediately.
Skin:	Immediately wash the skin with plenty of water. If itchiness or irritation due to chemical burns persists and get a medical treatment immediately.
Eyes:	Immediately rinse the eye with plenty of water and get a medical treatment.
Ingestion:	If a battery is swallowed, get a medical treatment immediately. If the contents come into mouth, immediately rinse mouth thoroughly with water, and get a medical treatment.

SECTION 5: Fire Fighting Measures

How to Extinguish Use fire extinguisher (for Lithium Battery) , Sand or foam (spray) fire extinguishing equipment.

Burning battery may generate toxic gas, so wear a respiratory protective equipment. Extinguishing by water may cause a reaction of Metallic Lithium and the water, and it may cause bursting and scattering .

SECTION 6: Accidental Release Measures

If liquid (electrolyte) leaks from the battery, wipe off the liquid with a waste clothes, and place it in a ventilated space without direct sunlight or fire.

SECTION 7: Handling and Storage

Handling

Do not charge by higher current or higher voltage than specified.

Do not heat, disassemble nor dispose of in fire.

Do not solder directly to the battery. Do not short-circuit.

Do not reverse placement of (+) and (-).

Do not discharge by force.

In case of leakage or a strange smell, keep away from fire to prevent ignition of any leaked electrolyte.

In case of disposal, insulate between (+) and (-) of battery by an insulating material such as a tape.

If leaked liquid gets in the eyes, wash them with clean water and consult a physician immediately.

Do not use new and used batteries together. Do not use different types of batteries together.

If you connect two or more batteries in series or parallel, please consult us in advance.

Do not use nor leave the batteries in direct sunlight nor in high-temperature areas.

Do not give a shock to the batteries nor hurl it.

Avoid contact with water.

Storage

Keep batteries out of children's reach.

Keep batteries away form direct sunlight, high temperature and humidity.

Please keep the batteries dry. Do not get it wet with water etc.

Avoid having the batteries touch each other, because short-circuit causes ignition, leakage or rupture.

SECTION 8: Exposure Controls / Personal Protection

The battery is sealed with a metal can in order to avoid leakage of harmful gas or liquid. When handling in accordance with the preceding paragraph, usually no protective equipment is required. Wear protective equipment when liquid (electrolytic solution) leaks from the main body.

Respiratory Protection:	Protective mask with a filter preferably
Hands Protection:	Safety gloves
Eye Protection:	Safety goggles and/or glasses for chemicals

SECTION 9: Physical and Chemical Properties

Shape	Coin type
Chemical System	Lithium-Manganese composite oxide/ Lithium-Aluminium alloy
Rechargeable	(YES) / NO

SECTION 10: Stability and Reactivity

Stability:	Stable at normal handling
Condition to Avoid:	See section 7

SECTION 11: Toxicological Information

When normal handling, this battery is not noxious to the human body because the content sealed with cases.

SECTION 12: Ecological Information

There is no ecological information particularly.

*It is reported that batteries leaked almost no metal ingredients even if buried in the ground.

SECTION 13: Disposal Considerations

Dispose of the battery in accordance with the respective national, federal, state, and local regulations.

SECTION 14: Transport Information

United Nations Number	UN3090 (Batteries contained in equipment; or batteries packed with equipment; UN3091)
Shipping Name	Lithium metal batteries
UN Hazard Classification	Class 9

This product can be transported as non-dangerous goods because it meets the transportation conditions listed in the Special provision 188.

＜Lithium content＞	Less than 1g. ※The Lithium content of this battery is 0.0004 g.
＜Safety Certificate＞	Each cell or battery must be of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3. *This battery was manufactured by the factory that acquired ISO 9001 based on the quality program , and passed the UN 38.3 test.
＜Packaging for preventing short circuit ＞	Except when batteries contained in equipment, it must be to prevent short circuit and wrapped in a strong container or packaging.
＜Label & Marking display＞	Appropriate labeling and marking are required for each package.
＜Packing Drop test＞	Except when batteries contained in equipment, each package must be capable of withstanding a 1.2 m drop test.

Method	Organization		Packaging instruction and special provision applicable to this product		
Air	IATA:DGR ICAO:ICAO TI	Lithium Metal Batteries(UN3090)	PI968	Section IB (Dangerous Goods) Section II (Not Dangerous Goods)	*1, 3
		Packed in equipment(UN3091)	PI969	Section I (Dangerous Goods) Section II (Not Dangerous Goods)	
		Contained with equipment(UN3091)	PI970	Section I (Dangerous Goods) Section II (Not Dangerous Goods)	
Marine	IMO		SP188 *2, 3		

*1 It can be transported as a non-dangerous good if the following conditions are satisfied (Cargo Aircraft Only), because Lithium content is not more than 0.3 g in a battery.
・Packaging remains our shipment condition.
・1 cargo is within 1 overpack (maximum net amount (battery weight) 2.5 kg or less).
・It meets Section II of PI 968, DGR .

*2 When this product is transported on the sea while satisfying the special provision SP 188, it can be transported as non-dangerous goods. However, it should not exceed 30 kg per packaging. (Battery contained in equipment or packed with equipment are not subject to this.)

*3 Please confirm details of each packing criteria, be sure to carry out required packaging display and shipper's declaration for dangerous goods, etc. Also, as there are regulations by each country and each transportation company, please check in advance.

SECTION 15: Regulatory Information

・United Nations Regulations
・EU Battery Directive : Directive 2006/66/EC and Directive 2013/56/EU
・EU REACH Regulation

SECTION 16: Other Information

SDS is not applied to products that are used in a sealed condition. So, we do not have the obligation to publish this document since the battery corresponds to the condition above. But, we offer this document for reference. The data and evaluation results written on this document was known at the time of preparation, but it is not something that is guaranteed.

References
(1) IATA Dangerous Goods Regulations 61st Edition.

End of Documents.

Safety Data Sheets (SDSs)

Client	SHENZHEN GAONENGDA BATTERY CO., LTD.
Add. of Client	No.28,Changjin Rd.,He’ao Yuanshan Sub-Dist. Longgang Shenzhen, China
Description	Lithium Manganese Dioxide Button Cell
Model /Type	CR1220
Manufacturer	SHENZHEN GAONENGDA BATTERY CO., LTD.
Add. of Manufacturer	No.28,Changjin Rd.,He’ao Yuanshan Sub-Dist. Longgang Shenzhen, China
Nominal Voltage	3.0V, 40mAh,0.12Wh
Date of Receipt	Apr. 03. 2020

Approved Signatory	Maggie.Gao
Inspected by	Mary Li
Censored by	Peter Wu

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Identifier

Product name: Lithium Manganese Dioxide Button Cell

Model: CR1220

Other means of identification

Synonyms:none

Recommended use of the chemical and restrictions on use

Recommended Use:Used in portabl electronic equipments;

Uses advidsed against:

a) Do not dismantle, open or shred batteries.

b) Do not expose batteries to heat or fire. Avoid storage in direct sunlight.

c) Do not short-circuit battery. Do not store batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.

d) Do not remove a battery from its original packaging until required for use.

e) Do not subject batteries to mechanical shock.

f) In the event of a cell leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.

g) Observe the plus (+) and minus (–) marks on the cell, battery and equipment and ensure correct use.

h) Do not use any cell or battery which is not designed for use with the equipment.

i) Do not mix cells of different manufacture, capacity, size or type within a device.

j) Battery usage by children should be supervised.

k) Seek medical advice immediately if a cell or a battery has been swallowed.

l) Always purchase the battery recommended by the device manufacturer for the equipment.

m) Keep cells and batteries clean and dry.

n) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.

o) Use only the cell or battery in the application for which it was intended.

p) When possible, remove the battery from the equipment when not in use.

q) Dispose of properly.

Details of the supplier of the safety data sheet:

Supplier Name: SHENZHEN GAONENGDA BATTERY CO., LTD.

Address: No.28,Changjin Rd.,He’ ao Yuanshan Sub-Dist. Longgang Shenzhen, China

Telephone number of the supplier: 0086-0755-28626181

Fax: 0086-0755-28626181

Postcode: 518115

E-mail address: yb@gld-battery.com

Emergency telephone number

Company Emergency Phone Number: 0086-0755-28626181

2. HAZARDS IDENTIFICATION

Classification

No harm at the normal use. If contact the Electrolyte in the Lithium Manganese Dioxide Button Cell, reference as follows:

Classification of the substance or mixture

Classification according to GHS

Acute Toxicity, Oral(Hazard category 4)

Acute Toxicity, inhalation(Hazard category 4)

Serious eye damage/eye irritation (Hazard category 2A)

GHS Label elements, including precautionary statements:

GHS07

Signal word: Warning

Hazard statement(s):

H319: Causes serious eye irritaion;

H332: Harmful if inhaled;

H302: Harmful if swallowed;

precautionary statements:

Prevention:

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P261 Avoid brething dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

Response:

P312:Call a Poison center or doctor/physician if you feel unwell.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists:Get medical advice/attention.

P304+P340 IF INHALED:Remove person to fresh air and keep comfortable for breathing.

P301+P312:IF SWALLOWED:Call a Poison center or doctor/physician if you feel unwell.

P330 Rinse mouth.

Storage:

None

Disposal

P501: Dispose of contents/container in accordance with local/national regulations

Hazards not otherwise classified (HNOC)

Not Applicable

Other information

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterixation: Mixtures

Description:

Product: Consisting of the following components.

Common Chemical Name	Concentration (%)	CAS Number
Lithium Dioxide Manganese	30	1313-13-9
Propylene Carbonate	6	108-32-7
1,2-Dimethoxyethane	5	110-71-4
Lithium Perchlorate	1	7791-03-9
Lithium	3	7439-93-2
Carbon	3	7782-42-5
Stainless steel	52	7439-89-6

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

4. FIRST-AID MEASURES

First aid measures

Eye Contact Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.

Skin Contact Remove contaminated clothing and shoes. Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

Inhalation Move to fresh air. If symptoms persist, call a physician.

Ingestion Do NOT induce vomiting. Drink plenty of water. If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed

Swallowing Do not induce vomiting. Get medical attention.

Most Important Symptoms/Effects No information available.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

CO2, dry chemical powder, water spray.

Unsuitable Extinguishing Media:No information available.

Specific Hazards Arising from the Chemical

Formation of toxic gases is possible during heating or in case of fire.

In case of fire, the following can be released:

Carbon monoxide(CO)
Carbon dioxide
Other irritating and toxic gases.

Hazardous Combustion Products

Carbon oxides.
Explosion Data
Sensitivity to Mechanical Impact No
Sensitivity to Static Discharge No

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. For example: Wear self-contained respiratory protective device. Wear suitable protective clothing and eye/face protection.

Special hazards arising from the substance or mixture:

Battery may burst and release hazardus decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150℃), When damaged or abused(e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with eyes.
Refer to section 8 for personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.
Evacuate personnel to safe areas.

Environmental precautions

Environmental Precautions Refer to protective measures listed in Sections 7 and 8.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.
Methods for Cleaning up Use personal protective equipment. Dam up. Cover liquid spill with sand, earth or other Non combustible absorbent material. Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.
Wash thoroughly after handling. Use this material with adequate ventilation.
The product is not explosive.

Conditions for safe storage, including any incompatibilities

If the Lithium Manganese Dioxide Button Cell is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium Manganese Dioxide Button Cell periodically.
3 months: -10℃~+40℃, 45 to 85%RH
And recommended at 0℃~+35℃ for long period storage.
Do not storage Lithium Manganese Dioxide Button Cell 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 Lithium Manganese Dioxide Button Cell to heat or fire. Avoid storage in direct sunlight.
Do not store together with oxidizing and acidic materials.
Keep ignition sources away- Do not smoke.
Store in cool, dry and well-ventilated place.

Incompatible Products None known.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

CAS Number	ACGIH	NIOSH	OSHA
7782-42-5	TLV-TWA 2mg/m^3	RELs-TWA2.5mg/m^3	PELs-TWA 15mppcf
1333-86-4	TLV-TWA 3mg/m^3	RELs-TWA3.5mg/m^3	PELs-TWA 3.5mg/m^3
1313-13-9	PELs-TWA 0.1mg/m^3 PELs-TWA 0.02mg/m^3	N/A	N/A

Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962(11th Cir., 1992).

Appropriate engineering controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Ensure adequate ventilation.

Individual protection measures, such as personal protective equipment

Eye/Face Protection:

Tightly sealed goggles

Body protection:

Protective work clothing.

Skin protection:

Protective gloves

Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material:

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

Respiratory Protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Form: button
	Color: silver
	Odour: Odourless
	Odor Threshold: No information available
Change in condition:	
pH, with indication of the concentration	Not determined.
Melting point/freezing point	Not determined.
Initial boiling point and Boiling range:	Not determined.
Flash Point	Not determined.
Evaporation rate	Not determined.
Flammability (solid, gas)	Not determined.
Upper/lower flammability or explosive limits	Not determined.
Vapor Pressure:	Not determined.
Vapor Density:	Not determined.
relative density:	Not determined.
Solubility in Water:	Not determined.
Solubility in other solvents	Not determined.
n-octanol/water partition coefficient	Not determined.
Auto-ignition temperature	Product is not self-igniting.
Decomposition temperature	Not determined.
Odout threshold	Not determined.
Evaporation rate	Not determined.
Viscosity	Not determined.

Other Information	:
Voltage	3.0V
Electric capacity	150mAh
Lithium content	0.045g

10. STABILITY AND REACTIVITY

Reactivity: Stable under recommended storage and handling conditions (see section 7, Handling and storage).

Chemical stability: Stable under normal conditions of use, storage and transport.

Thermal decomposition/conditions to be avoided: No decomposition if used according to specifications.

Possibility of Hazardous Reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Strong heating, fire, Incompatible materials.

Incompatible materials: Strong oxidizing agents. Strong acids.Base metals.

Hazardous Decomposition Products: Carbon oxides, Other irritating and toxic gases.

11. TOXICOLOGICAL INFORMATION

Acute toxiciy: No data available.

LD/LC50 values relevant for classification:
Not available.

Skin corrosion/irritation: No irritant effect.

Serious eye damage/irritation: Cause serious eye irritation.

Respiratory or skin sensitization: No sensitizing effects known.

Specific target organ system toxicity: No information available.

CMR effects(carcinogenity, mutagenicity and toxicity for reproduction): No information available.

12. Ecological Information

Toxicity:

Acquatic toxicity:
No further relevant information available.

Persistence and degradability: No further relevant information available.

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Recommendation: Must not be disposed together with household garbage.

Do not allow product to reach sewage system

Uncleaned packaging:

Recommendation: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

Land transport

ADR/RID class: Not regulated.

UN-Number: UN3090 or UN3091.

Maritime transport

IMDG Class: Class 9.

UN Number: UN3090 or UN3091.

Marine pollutant: No

Air transport

ICAO/IATA Class: Class 9

UN/ID Number: UN3090 or UN3091

Environmental hazards: Not applicable.

Special precautions for user: Not applicable.

Transport/Additional information: Not restricted goods according to the above specifications.

The Lithium Manganese Dioxide Button Cell had been tested according to the requirements of the UN manual of tests and Criteria, Part III, subsection 38.3;

The lithium ion batteries according to Section II of PACKING INSTRUCTION 968, or Section II of PACKING INSTRUCTION 969 ~ 970 of the Dangerous Goods regulations 60th Edition may be transported.

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

Meets requirements of Special Provision 188 of IMDG(38-16) to be transported as non-dangerous goods

Meets the requirements of 49CFR173.185 to be transported as non-dangerous goods for road, rail, air, and vessel (Effective August 6, 2014 per HM224F)

The package must be handled with care and that a flammability hazard exists if the package is damaged;

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation:

Authorisations: No information available.

Restrictions on use: No information available.

Regulatory information

CAS No.	EU (EINECS)	**US (TSCA)**	**Japan (ENCS)**	**Canada (DSL/ NDSL)**	**Austrlia (AICS)**	**Korea (ECL)**	**China (IECSC)**
1313-13-9	Listed	Listed	Listed	DSL	Listed	Listed	Listed
108-32-7	Listed	Listed	Listed	DSL	Listed	Listed	Listed
110-71-4	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7791-03-9	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7439-93-2	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7782-42-5	Listed	Listed	Listed	DSL	Listed	Listed	Listed
7439-89-6	Listed	Listed	Listed	DSL	Listed	Listed	Listed

Chemical safety assessment A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases:

R20/22: Harmful by inhalation and if swallowed.

R36: Irritating to eyes.

H302: Harmful if swallowed.

H332: Harmful if inhaled.

**********End of SDS**********