

# Design Report of Safety Data Sheet

Report No. :HGNM22D3N1

Issue date:2022. 03. 15

<b>Product Name:</b>	Lithium ion Battery Module CM4100
<b>Applicant:</b>	FOXESS CO., LTD.
<b>Supplier:</b>	FOXESS CO., LTD.
<b>Composition of the product:</b>	Ferrous Lithium Phosphate : 36% ; Graphite : 18% ; Aluminum : 12% ; Copper : 10% ; Ethyl methyl carbonate : 7% ; Dimethyl carbonate : 6% ; Ethylene carbonate : 6% ; Polyethylene : 2.5% ; Carbon : 1% ; Polymerized Styrene Butadiene Rubber : 0.6% ; Poly(1,1-difluoroethylene) : 0.6% ; Carboxymethylcellulose Sodium : 0.3% .
<b>Warranty of Design:</b>	GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) Ninth revised edition

Design Result of SDS please see next page.

Designer:



Auditor:



Approver:



常州合規思遠產品安全技術服務有限公司

Changzhou Hegui Siyuan Products Safety Technology Service Co., Ltd.

報告專用章

## Terms of the Using of the Report

1. According to the needs of the report, our company requires the client to provide true and complete samples and information.
2. Information from applicant is the key of this report, our company will not respond for the wrong of applicant.
3. If there is any change in the chemical information submitted by the client, this report will automatically become invalid.
4. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
5. This report will be effective only after it is signed by the inspector, approver and stamped by our company.
6. Our company guarantees the objectivity and fairness of this report, and carries out confidentiality obligations on business secrets such as business information, technical documents and so on.
7. This report does not consider the differences between countries and operators.
8. The partly duplicating of this report is prohibited without the written approver.
9. The report is invalid when anything of the following happens-illegal transfer, embezzlement, imposture, modification or tampering in any media form.
10. This report is valid before the implementation of the new version of the standard.

名称：常州合规思远产品安全技术有限公司（简称：合规化学）

Name: Changzhou Hegui Siyuan Products Safety Technology Service Co., Ltd. (CRchemical)

地址：江苏省常州市新北区太湖东路9号4幢1205室

Address: 4-1205, Creative Industries Park, No.9, East Taihu Road, Xinbei District, Changzhou, 213022, Jiangsu P.R.China.

网址|Web: [www.hgmsds.com](http://www.hgmsds.com)

电话|Tel: +86-519-8515 0306

邮箱|E-mail: [msds@hgmsds.com](mailto:msds@hgmsds.com)

## Safety Data Sheet

# Lithium ion Battery Module CM4100

Version: V2.0.0.1

Report No.: HGNM22D3N1

Creation Date: 2022/03/15

Revision Date: 2022/03/15

\*Prepared according to UN GHS (the 9th revised edition)

## 1 Identification

### Product identifier

Product Name	Lithium ion Battery Module CM4100
Product Model	CM4100
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable

### Recommended use of the product and restrictions on use

Relevant identified uses	Please consult manufacturer.
Uses advised against	Please consult manufacturer.

### Details of the supplier

Applicant Name	FOXESS CO., LTD.
Applicant Address	No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China
Applicant Post Code	325058
Applicant Telephone	0510-68092998
Applicant Fax	—
Applicant E-mail	zhou-yong@fox-ess.com
Supplier Name	FOXESS CO., LTD.
Supplier Address	No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China
Supplier Post Code	325058
Supplier Telephone	0510-68092998
Supplier Fax	—
Supplier E-mail	zhou-yong@fox-ess.com

### Emergency phone number

Emergency phone number	0510-68092998
------------------------	---------------

## 2 Hazard(s) identification

### Hazard classification according to GHS

The product meets the definition of "article". In the Globally Harmonized Chemical Classification and Labeling System (GHS), the "articles" defined by the US Occupational Safety and Health Administration "Hazard Communication Standard" (29 CFR 1910.1200) or similar definitions do not fall within the scope of this system. [Rev. 9 (2021) Part 1.3.2.1.1]. According to GHS system (9th revised edition), not classified as a hazardous chemical.

**GHS Label elements**

Hazard pictograms	Not applicable
Signal word	Not applicable

**Hazard statements**

Hazard statements	Not applicable
-------------------	----------------

**Precautionary statements**

## ◆ Prevention

Prevention	Not applicable
------------	----------------

## ◆ Response

Response	Not applicable
----------	----------------

## ◆ Storage

Storage	Not applicable
---------	----------------

## ◆ Disposal

Disposal	Not applicable
----------	----------------

**Hazard description**

## ◆ Physical and chemical hazards

	When the outer enclosure and safety circuits have been compromised or have been significantly damaged, it is likely to contain substantial electrical charge and can cause injury or death if mishandled. Mechanical damage can lead to danger. Battery products exposed to high temperature conditions, may produce heat out of control, causing fire.
--	---

## ◆ Health hazards

Inhaled	According to the material form, it is not the normal way of contacting.
Ingestion	Accidental ingestion of the product may be harmful to the health of the individual.
Skin Contact	No harm in general situation.
Eye	This product may cause temporary discomfort following direct contact with the eye.

## ◆ Environmental hazards

	Please refer to 12th chapter of SDS.
--	--------------------------------------

**3 Composition/information on ingredients****Substance/mixture**

	Mixture
--	---------

Component	CAS No.	EC No.	Concentration (wt, %)
Ferrous Lithium Phosphate	15365-14-7	604-917-2	36
Graphite	7782-42-5	231-955-3	18
Aluminum	7429-90-5	231-072-3	12
Copper	7440-50-8	231-159-6	10
Ethyl methyl carbonate	623-53-0	613-014-2	7

<b>Dimethyl carbonate</b>	616-38-6	210-478-4	6
<b>Ethylene carbonate</b>	96-49-1	202-510-0	6
<b>Polyethylene</b>	9002-88-4	618-339-3	2.5
<b>Carbon</b>	7440-44-0	231-153-3	1
<b>Polymerized Styrene Butadiene Rubber</b>	9003-55-8	618-370-2	0.6
<b>Poly(1,1-difluoroethylene)</b>	24937-79-9	607-458-6	0.6
<b>Carboxymethylcellulose Sodium</b>	9004-32-4	618-378-6	0.3

## 4 First-aid measures

### Description of first aid measures

<b>General advice</b>	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
<b>Eye contact</b>	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable.
<b>Skin contact</b>	No harm in general situation. First aid is not needed.
<b>Ingestion</b>	Never give anything by mouth to an unconscious person. Call a physician immediately.
<b>Inhalation</b>	Move victim into fresh air. If breathing is difficult, give oxygen and consult a physician immediately.
<b>Protecting of first-aiders</b>	Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination.

### Most important symptoms/effects, acute and delayed

1	Please see section 11.
---	------------------------

### Indication of any immediate medical attention and special treatment needed

1	Treat symptomatically.
2	Symptoms may be delayed.

## 5 Fire-fighting measures

### Extinguishing media

<b>Suitable extinguishing media</b>	Use extinguishing media suitable for surrounding area.
<b>Unsuitable extinguishing media</b>	There is no restriction on the type of extinguisher which may be used.

### Specific hazards arising from the substance or mixture

1	Development of hazardous combustion gases or vapor possible in the event of fire.
2	May expansion or decompose explosively when heated or involved in fire.

### Special protective equipment and precautions for fire-fighters

1	As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full protective gear.
2	Fight fire from a safe distance, with adequate cover.
3	Prevent fire extinguishing water from contaminating surface water or the ground water system.

## 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

1	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
2	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.
3	Use personal protective equipment, do not breathe dust/fume.

### Environmental precautions

1	Prevent further leakage or spillage if safe to do so.
2	Discharge into the environment must be avoided.

### Methods and materials for containment and cleaning up

1	Cut off the source of the leak as much as possible.
2	Keep leaks in a ventilated place.
3	Isolation of contaminated areas and restrictions on access.
4	It is recommended that emergency personnel wear dust masks.
5	Collect the spill with a clean shovel and place it in a clean, dry, loosely closed container and move the container away from the leak.
6	Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

## 7 Handling and storage

### Precautions for safe handling

1	Handling is performed in a well ventilated place.
2	Avoid contact with eyes.
3	Keep away from heat/sparks/open flames/ hot surfaces.

### Conditions for safe storage, including any incompatibilities

1	Keep containers tightly closed.
2	Keep containers in a dry, cool and well-ventilated place.
3	Keep away from heat/sparks/open flames/hot surfaces.
4	Store away from incompatible materials and foodstuff containers.

## 8 Exposure controls/personal protection

### Control parameters

Component	Country/Region	Limit value - Eight hours		Limit value - Short term	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Graphite	USA - OSHA	-	15	-	-
	South Korea	-	2	-	-
	Ireland	-	10	-	-
	Germany (DFG)	-	4	-	-
	Denmark	-	2.5	-	5
	Australia	-	3 (4)	-	-

<b>Aluminum</b>	USA - OSHA	-	15	-	-
	South Korea	-	10	-	-
	Ireland	-	1	-	-
	Germany (DFG)	-	4	-	-
	Denmark	-	5	-	10
	Australia	-	10	-	-
<b>Copper</b>	The Netherlands	-	0.1	-	-
	Poland	-	0.2	-	-
	Latvia	-	0.5	-	1
	Germany (DFG)	-	0.01	-	0.02

◆ Biological limit values

<b>Biological limit values</b>	No relevant regulations
--------------------------------	-------------------------

◆ Monitoring methods

1	EN 14042 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
2	GBZ/T 300 series standard Determination of toxic substances in workplace air.

### Engineering controls

1	Ensure adequate ventilation, especially in confined areas.
2	Ensure that eyewash stations and safety showers are close to the workstation location.
3	Set up emergency exit and necessary risk-elimination area.
4	Handle in accordance with good industrial hygiene and safety practice.

### Personal protection equipment

<b>General requirement</b>	No special requirements, please see the description below.
<b>Eye protection</b>	In general situation, eye protection is not needed. In the production process, when contacting with vapour or dust, tightly fitting safety goggles.
<b>Hand protection</b>	In general situation, hand protection is not needed.
<b>Respiratory protection</b>	In general situation, respiratory protection is not needed. If exposure limits are exceeded or if irritation or other symptoms are experienced, wear dust proof mask or gas defence mask.
<b>Skin and body protection</b>	In general situation, skin and body protection are not needed.

## 9 Physical and chemical properties and safety characteristics

### Physical and chemical properties

<b>Physical state</b>	Solid (lithium-ion battery module, individually packaged, battery parameters: 57.6V 70Ah 4030Wh)
<b>Colour</b>	White
<b>Odor</b>	No special odor
<b>Odor threshold</b>	No information available
<b>pH</b>	No information available
<b>Melting point/freezing point(°C)</b>	No information available

Initial boiling point and boiling range(°C)	No information available
Flash point(Closed cup,°C)	Not applicable
Evaporation rate	Not applicable
Flammability	Not flammable
Upper/lower explosive limits[%(v/v)]	Upper limit: No information available; Lower limit: No information available
Vapor pressure	Not applicable
Relative vapour density(Air = 1)	Not applicable
Relative density(Water=1)	No information available
Solubility	Insoluble in water
n-octanol/water partition coefficient	No information available
Auto-ignition temperature(°C)	No information available
Decomposition temperature(°C)	No information available
Kinematic viscosity	Not applicable
Particle characteristics	No information available

## 10 Stability and reactivity

### | Stability and reactivity

Reactivity	Contact with incompatible substances can cause decomposition or other chemical reactions.
Chemical stability	Stable under proper operation and storage conditions.
Possibility of hazardous reactions	Mixtures with metallic acetylene, when heated, cause a fire or incandescence. Ultrafine powder will self-ignite in the air at room temperature. Reacts severely with halogens, interhalogens or other strong oxidants, or causes a fire.
Conditions to avoid	Incompatible materials, heat, flame and spark.
Incompatible materials	Metal acetylides, halogen, interhalogen, halogen oxides, nitric acid, nitrous oxide, nitrates, nitrites, halogen oxyacid salts, chromates, permanganates, inorganic peroxides, metal oxides and peroxyformic acid. Oxidants, halogen, interhalogen and mercury. Halogen, interhalogen, strong oxidant, water and acids.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 11 Toxicological information

### | Acute toxicity

Component	LD <sub>50</sub> (oral)	LD <sub>50</sub> (dermal)	LC <sub>50</sub> (inhalation,4h)
Carboxymethylcellulose Sodium	27000mg/kg(Rat)	> 2000mg/kg(Rabbit)	> 5.8mg/L(Rat)
Dimethyl carbonate	13000mg/kg(Rat)	> 5000mg/kg(Rabbit)	No information available
Ethylene carbonate	10000mg/kg(Rat)	> 3000mg/kg(Rabbit)	No information available

### | Carcinogenicity

Component	List of carcinogens by the IARC	Report on Carcinogens by NTP
-----------	---------------------------------	------------------------------



	Monographs	
Carbon	Not Listed	Not Listed
Polymerized Styrene Butadiene Rubber	Category 3	Not Listed
Poly(1,1-difluoroethylene)	Not Listed	Not Listed
Carboxymethylcellulose Sodium	Not Listed	Not Listed
Ferrous Lithium Phosphate	Not Listed	Not Listed
Graphite	Not Listed	Not Listed
Aluminum	Not Listed	Not Listed
Copper	Not Listed	Not Listed
Ethyl methyl carbonate	Not Listed	Not Listed
Dimethyl carbonate	Not Listed	Not Listed
Ethylene carbonate	Not Listed	Not Listed
Polyethylene	Category 3	Not Listed

## Others

Lithium ion Battery Module CM4100	
Skin corrosion/irritation	Based on available data, the classification criteria are not met
Serious eye damage/irritation	Based on available data, the classification criteria are not met
Skin sensitization	Based on available data, the classification criteria are not met
Respiratory sensitization	Based on available data, the classification criteria are not met
Reproductive toxicity	Based on available data, the classification criteria are not met
STOT-single exposure	Based on available data, the classification criteria are not met
STOT-repeated exposure	Based on available data, the classification criteria are not met
Aspiration hazard	Based on available data, the classification criteria are not met
Germ cell mutagenicity	Based on available data, the classification criteria are not met
Reproductive toxicity(additional)	Based on available data, the classification criteria are not met

## 12 Ecological information

### Acute aquatic toxicity

Component	Fish	Crustaceans	Algae
Carboxymethylcellulose Sodium	No information available	EC <sub>50</sub> : 87.3mg/L (48h)(Crustaceans)	No information available
Copper	LC <sub>50</sub> : 0.665mg/L (96h)(Fish)	EC <sub>50</sub> : 0.02mg/L (48h)(Crustaceans)	ErC <sub>50</sub> : 7.9mg/L (96h)(Algae)
Aluminum	LC <sub>50</sub> : 1.55mg/L (96h)(Fish)	No information available	No information available

### Chronic aquatic toxicity

Chronic aquatic toxicity	No information available
--------------------------	--------------------------

### Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
Graphite	Low	Low
Ethyl methyl carbonate	High	High
Ethylene carbonate	High	High
Polyethylene	Low	Low

### Bioaccumulative potential

Component	Bioaccumulative potential	Comments
Graphite	Low	Log Kow=0.5294
Ethyl methyl carbonate	Low	Log Kow=0.7247
Ethylene carbonate	Low	Log Kow=-0.3388
Polyethylene	Low	Log Kow=1.2658

### Mobility in soil

Component	Mobility in soil	Soil Organic Carbon-Water Partitioning Coefficient (Koc)
Graphite	Low	23.74
Ethyl methyl carbonate	Low	15.22
Ethylene carbonate	Low	9.168
Polyethylene	Low	14.3

### Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]
Graphite	Not applicable
Aluminum	Not applicable
Copper	Not applicable
Ethyl methyl carbonate	Not PBT/vPvB
Dimethyl carbonate	Not PBT/vPvB
Ethylene carbonate	Not PBT/vPvB


## 13 Disposal considerations

### Disposal considerations

Waste chemicals	Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal.
Contaminated packaging	Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible.
Disposal recommendations	Refer to section waste chemicals and contaminated packaging.

## 14 Transport information

**Label and Mark**

Transporting Label	
--------------------	---

**IMDG-CODE**

UN number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class	9
Transport subsidiary hazard class	None
Packing group	The packaging must meet the performance level of packaging type II
Marine pollutant (Yes or no)	No

**IATA-DGR**

UN number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class	9
Transport subsidiary hazard class	None
Packing group	The packaging must meet the performance level of packaging type II

**UN-ADR**

UN number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class	9
Transport subsidiary hazard class	None
Packing group	The packaging must meet the performance level of packaging type II

**15 Regulatory information****International chemical inventory**

Component	EINECS	TSCA	DSL	IECSC	NZIoC	PICCS	KECI	AIIC	ENCS
Carbon	√	√	√	√	√	√	√	√	√
Polymerized Styrene Butadiene Rubber	×	√	√	√	√	√	√	√	√
Poly(1,1-difluoroethylene)	×	√	√	√	√	√	√	√	√
Carboxymethylcellulose Sodium	×	√	×	√	√	√	√	√	√
Ferrous Lithium Phosphate	×	√	√	√	×	×	√	×	√
Graphite	√	√	√	√	√	√	√	√	×
Aluminum	√	√	√	√	√	√	√	√	√
Copper	√	√	×	√	√	√	√	√	√

<b>Ethyl methyl carbonate</b>	×	√	×	√	×	√	√	×	√
<b>Dimethyl carbonate</b>	√	√	√	√	√	√	√	√	√
<b>Ethylene carbonate</b>	√	√	√	√	√	√	√	√	√
<b>Polyethylene</b>	×	√	√	√	√	√	√	√	√

[EINECS] European Inventory of Existing Commercial Chemical Substances

[TSCA] United States Toxic Substances Control Act Inventory

[DSL] Canadian Domestic Substances List

[IECSC] China Inventory of Existing Chemical Substances

[NZIoC] New Zealand Inventory of Chemicals

[PICCS] Philippines Inventory of Chemicals and Chemical Substances

[KECI] Korea Existing Chemicals Inventory

[AIIC] Australia. Inventory of Industrial Chemicals (AIIC)

[ENCS] Japan Inventory of Existing & New Chemical Substances

Note:

“√” Indicates that the substance included in the regulations.

“×” No data or not included in the regulations.

## 16 Other information

### Information on revision

<b>Creation Date</b>	2022/03/15
<b>Revision Date</b>	2022/03/15
<b>Reason for revision</b>	-

### Reference

- [1] IPCS: The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>.
- [2] IARC, website: <http://www.iarc.fr/>.
- [3] OECD: The Global Portal to Information on Chemical Substances, website: <https://www.echemportal.org/echemportal/substancesearch/index.action>.
- [4] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>.
- [5] NLM: ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>.
- [6] EPA: Integrated Risk Information System, website: <http://cfpub.epa.gov/iris/>.
- [7] U.S. Department of Transportation: ERG, website: <http://www.phmsa.dot.gov/hazmat/library/erg>.
- [8] Germany GESTIS-database on hazard substance, website: <http://gestis-en.itrust.de/>.

### Abbreviations and acronyms

CAS	Chemical Abstracts Service	UN	The United Nations
PC-STEL	Short term exposure limit	OECD	Organization for Economic Co-operation and Development
PC-TWA	Time Weighted Average	IMDG	International Maritime Dangerous Goods
MAC	Maximum Allowable Concentration	IARC	International Agency for Research on Cancer
DNEL	Derived No Effect Level	ICAO	International Civil Aviation Organization
PNEC	Predicted No Effect Concentration	IATA	International Air Transportation Association
NOEC	No Observed Effect Concentration	ACGIH	American Conference of Governmental Industrial Hygienists
LC <sub>50</sub>	Lethal Concentration 50%	NFPA	National Fire Protection Association
LD <sub>50</sub>	Lethal Dose 50%	NTP	National Toxicology Program
EC <sub>50</sub>	Effective Concentration 50%	PBT	Persistent, Bioaccumulative, Toxic
EC <sub>x</sub>	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
P <sub>OW</sub>	Partition coefficient Octanol: Water	CMR	Carcinogens, mutagens or substances toxic to reproduction
BCF	Bioconcentration factor	RPE	Respiratory Protective Equipment
ED	Endocrine disruptor		

### Disclaimer

This Safety Data Sheet (SDS) was prepared according to UN GHS (the 9th revised edition). The data included was

derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.