

# **Design Report of Safety Data Sheet**

Report No.: HGBZ221029Y2

Issue date: 2022/10/12

Product Name:	Lithium ion Battery Module PS2900H-M		
Applicant:	8 Star Energy Pty Ltd.		
Supplier:	FOXESS CO., LTD.		
Composition of the product:	Ferrous Lithium Phosphate: 33%; Graphite: 16%; Aluminum: 15%; Copper: 8%; Dimethyl carbonate: 8%; Ethyl methyl carbonate: 8%; Ethylene carbonate: 7%; Polyethylene: 2.5%; Carbon: 1%; Polymerized Styrene Butadiene Rubber: 0.6%; Poly(1,1-difluoroethylene): 0.6%; Carboxymethylcellulose Sodium: 0.3%		
Warranty of Design:	GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) Ninth revised edition		

Design Result of SDS please see next page.

**Designer:** 

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**Auditor:** 

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Approver:

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常州合规思远产品安全技术服务有限公司

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

名称: 常州合规思远产品安全技术服务有限公司(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

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

网址|Web: www.hgmsds.com 电话|Tel: +86-519-8515 0306 邮箱|E-mail: msds@hgmsds.com



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名称: 常州合规思远产品安全技术服务有限公司(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

 $A\ d\ d\ : \qquad \text{4-1205, Creative Industries Park, No.9, East Taihu Road, Xinbei District, Changzhou, 213022, Jiangsu P.R. China.}$ 

网址|Web: www.hgmsds.com 电话|Tel: +86-519-8515 0306 邮箱|E-mail: msds@hgmsds.com

## **Safety Data Sheet**

# Lithium ion Battery Module PS2900H-M

Version: V2.0.0.1

Report No.: HGBZ221029Y2 Creation Date: 2022/10/12 Revision Date: 2022/10/12

\*According to GHS (Ninth Revised Edition)

# 1 Identification

#### Product identifier

•	
Product Name	Lithium ion Battery Module PS2900H-M
Product Model	PS2900H-M
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable

#### **Product Picture**



## 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

0. Otan Francis Divided
8 Star Energy Pty Ltd.
Level 35, 477 Collins St, Melbourne, VIC 3000, Australia
3000
+61 0431420061
hello@energizersolar.com
FOXESS CO., LTD.

Supplier Address	No.939, Jinhai Third Road, New Airport Industry Area, Longwan District, Wenzhou, Zhejiang, China
Supplier Post Code	325025
Supplier Telephone	0510-68092998
Supplier Fax	
Supplier E-mail	foxrd@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
<ul><li>Response</li></ul>		
	Response	Not applicable
<ul><li>Storage</li></ul>		

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.

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# 3 Composition/information on ingredients

### | Substance/mixture

Mixture

Component	CAS No.	EC No.	Concentration (wt, %)
Ferrous Lithium Phosphate	15365-14-7	604-917-2	33
Graphite	7782-42-5	231-955-3	16
Aluminum	7429-90-5	231-072-3	15
Copper	7440-50-8	231-159-6	8
Dimethyl carbonate	616-38-6	210-478-4	8
Ethyl methyl carbonate	623-53-0	613-014-2	8
Ethylene carbonate	96-49-1	202-510-0	7
Polyethylene	9002-88-4	618-339-3	2.5
Carbon	7440-44-0	231-153-3	1
Polymerized Styrene Butadiene Rubber	9003-55-8	618-370-2	0.6
Poly(1,1-difluoroethylene)	24937-79-9	607-458-6	0.6
Carboxymethylcellulose Sodium	9004-32-4	618-378-6	0.3

# 4 First-aid measures

## Description of first aid measures

1	
General advice	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable.
Skin contact	No harm in general situation. First aid is not needed.
Ingestion	Never give anything by mouth to an unconscious person. Call a physician immediately.
Inhalation	Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately.
Protecting of first-aiders	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**

1	
Suitable extinguishing media	Use extinguishing media suitable for surrounding area.
Unsuitable extinguishing	There is no restriction on the type of extinguisher which may be used.
media	

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#### 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

- 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.
- 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.
- 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 Wear suitable protective equipment.
- 3 Avoid contact with skin and eyes.
- 4 Keep away from heat/sparks/open flames/ hot surfaces.

## Conditions for safe storage, including any incompatibilities

1 Keep containers tightly closed.

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

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8 Exposure controls/personal protection

### Control parameters

Component	Country/Region	Limit value -	Eight hours	Limit value	- Short term
		ppm	mg/m³	ppm	mg/m³
Graphite	USA - OSHA		15		
	South Korea		2		
	Ireland		10		
	Germany (DFG)		4		
	Denmark		2.5		5
	Australia		3 (4)		
Aluminum	USA - OSHA		15		
	South Korea		10		
	Ireland		1		
	Germany (DFG)		4		
	Denmark		5		10
	Australia		10		
Copper	The Netherlands		0.1		
	Poland		0.2		
	Latvia		0.5		1
	Germany (DFG)		0.01		0.02

### Biological limit values

Biological limit values | 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

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

### Personal protection equipment

General requirement	No special requirements, please see the description below.
Eye protection	In general situation, eye protection is not needed. In the production process, when

	contacting with vapour or dust, tightly fitting safety goggles.
Hand protection	In general situation, hand protection is not needed.
Respiratory protection	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.
Skin and body protection	In general situation, skin and body protection are not needed.

# 9 Physical and chemical properties and safety characteristics

Physical and chemical prop	erties
Physical state	Solid (see the picture for details)
Colour	Black
Odor	No special odor
Odor threshold	No information available
рН	No information available
Melting point/freezing point(°C)	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	No information available.
Conditions to avoid	Incompatible materials, heat, flame and spark.
Incompatible materials	Metal acetylide, 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	Under normal conditions of storage and use, hazardous decomposition products
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 Monographs	Report on Carcinogens by NTP
Ferrous Lithium	Not Listed	Not Listed
Phosphate		
Graphite	Not Listed	Not Listed
Aluminum	Not Listed	Not Listed
Copper	Not Listed	Not Listed
Dimethyl carbonate	Not Listed	Not Listed
Ethyl methyl carbonate	Not Listed	Not Listed
Ethylene carbonate	Not Listed	Not Listed
Polyethylene	Category 3	Not Listed
Carbon	Not Listed	Not Listed
Polymerized Styrene	Category 3	Not Listed
Butadiene Rubber		
Poly(1,1-difluoroethylene)	Not Listed	Not Listed
Carboxymethylcellulose Sodium	Not Listed	Not Listed

# Others

Lithium ion Battery Module PS2900H-M		
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	Based on available data, the classification criteria are not met	
toxicity(additional)		

# 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
Graphite	LC <sub>50</sub> :100mg/L (96h)(Fish)	No information available	No information available
Dimethyl carbonate	$LC_{50} : \ge 100 \text{mg/L}$ (96h)(Fish)	EC <sub>50</sub> : > 100mg/L (48h)(Crustaceans)	No information available
Ferrous Lithium Phosphate	$LC_{50}$ : > 28mg/L (96h)(Fish)	$EC_{50}$ : > 28mg/L (48h)(Crustaceans)	No information available
Aluminum	LC <sub>50</sub> : 1.55mg/L (96h)(Fish)	No information available	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)
Ethyl methyl carbonate	LC <sub>50</sub> : > 100mg/L (96h)(Fish)	EC <sub>50</sub> : > 100mg/L (48h)(Crustaceans)	No information available
Ethylene carbonate	LC <sub>50</sub> : > 100mg/L (96h)(Fish)	EC <sub>50</sub> : > 100mg/L (48h)(Crustaceans)	No information available

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## | 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
Dimethyl carbonate	Not PBT/vPvB
Ethyl methyl carbonate	Not PBT/vPvB
Ethylene carbonate	Not PBT/vPvB

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# 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

**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	None
class	
Packing group	Packagings shall conform to the packing group II performance level
Marine pollutant ( Yes or no )	No

## ICAO/IATA-DG

UN number	3480
UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class	9
Transport subsidiary hazard	None
class	
Packing group	Packagings shall conform to the packing group $ \Pi $ performance level

### UN-ADR

<u> </u>	
UN number	3480

UN proper shipping name	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Transport hazard class	9
Transport subsidiary hazard	None
class	
Packing group	Packagings shall conform to the packing group $ \Pi $ performance level

# 15 Regulatory information

### International chemical inventory

Component	EC invento	TSCA	DSL	IECSC	NZIoC	PICCS	KECI	AIICS	ENCS
Ferrous Lithium Phosphate	×	<b>√</b>	V	√	×	×	V	×	V
Graphite	√	√	<b>V</b>	√	√	<b>√</b>	$\sqrt{}$	√	×
Aluminum	√	√	<b>√</b>	√	<b>√</b>	<b>√</b>	V	<b>V</b>	<b>√</b>
Copper	<b>√</b>	<b>√</b>	×	<b>√</b>	<b>√</b>	<b>√</b>	V	<b>√</b>	<b>√</b>
Dimethyl carbonate	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	V	<b>√</b>	<b>√</b>
Ethyl methyl carbonate	×	<b>√</b>	×	<b>√</b>	×	<b>√</b>	V	×	<b>√</b>
Ethylene carbonate	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	V	<b>√</b>	√
Polyethylene	×	√	<b>√</b>	<b>√</b>	√	<b>√</b>	V	√	√
Carbon	<b>√</b>	√	<b>V</b>	<b>√</b>	<b>√</b>	V	V	<b>V</b>	<b>√</b>
Polymerized Styrene Butadiene Rubber	×	<b>V</b>	<b>√</b>	<b>√</b>	<b>√</b>	V	V	V	<b>V</b>
Poly(1,1-difluoroethylene )	×	√		<b>√</b>	√	√	V	√	√
Carboxymethylcellulose Sodium	×	1	×	<b>√</b>	1	V	V	1	V

[EC European Inventory of Existing Commercial Chemical Substances

inventory]

United States Toxic Substances Control Act Inventory

[TSCA] [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] [AIICS] Korea Existing Chemicals Inventory

[ENCS]

Australian. Inventory of Industrial Chemical (AIICS) Japan Inventory of Existing & New Chemical Substances

#### Note:

- Indicates that the substance included in the regulations.
- No data or not included in the regulations.

# Other information

#### Information on revision

•	
Creation Date	2022/10/12
Revision Date	2022/10/12
Reason for revision	-

#### Reference

[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.

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- [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- CODE	International Maritime Dangerous Goods CODE
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
$EC_X$	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
Pow	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.