



Test Center of National Engineering Research Center of
Advanced Energy Storage Materials Co., Ltd.

SDS

Safety Data Sheets Report

Name of Sample : Lithium ion Battery Pack

Model/Type : TNL-15S5P-IFR26700-4000(48V 20Ah 960Wh)

Applicant : Tianneng Saft Energy Joint Stock Company
No.18, Baoqiao Road, Huaxi Street, Changxing
County, Huzhou City, Zhejiang Province

Manufacturer : Tianneng Saft Energy Joint Stock Company
No.18, Baoqiao Road, Huaxi Street, Changxing
County, Huzhou City, Zhejiang Province

Report No. : CESSDS240126018

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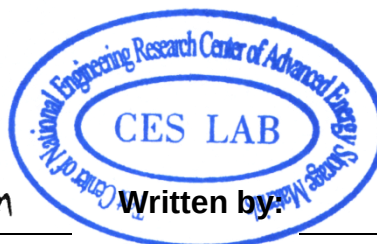
Effective Date: 2024.01.26

Approved by:

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Written by:

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SAFETY DATA SHEET

According to OSHA GHS 《A Guide to The Globally Harmonized System of Classification and Labelling of Chemicals 》, IATA DGR 《Dangerous Goods Regulations 》, IMO IMDG CODE 《INTERNATIONAL MARITIME Dangerous Goods CODE》

Section 1. Identification

Product Identifier

Product name: Lithium ion Battery Pack

Model: TNL-15S5P-IFR26700-4000 (48V 20Ah 960Wh)

Other means of identification

Synonyms: none

Recommended use of the chemical and restrictions on use

Recommended Use: Used in Energy Storage Fields

Uses advised against:

- a) Do not dismantle, open or shred secondary cells or batteries.
- b) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- c) Do not short-circuit a cell or a battery. Do not store cells or 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 cell or battery from its original packaging until required for use.
- e) Do not subject cells or 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) Do not use any charger other than that specifically provided for use with the equipment.
- h) Observe the plus (+) and minus (–) marks on the cell, battery and equipment and ensure correct use.
- i) Do not use any cell or battery which is not designed for use with the equipment.
- j) Do not mix cells of different manufacture, capacity, size or type within a device.
- k) Battery usage by children should be supervised.
- l) Seek medical advice immediately if a cell or a battery has been swallowed.
- m) Always purchase the battery recommended by the device manufacturer for the equipment.
- n) Keep cells and batteries clean and dry.
- o) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- p) Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer's instructions or equipment manual for proper charging instructions.
- q) Do not leave a battery on prolonged charge when not in use.
- r) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
- s) Retain the original product literature for future reference.

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- t) Use only the cell or battery in the application for which it was intended.
- u) When possible, remove the battery from the equipment when not in use.
- v) Dispose of properly.

Details of the Manufacturer of the safety data sheet:

Name: Tianneng Saft Energy Joint Stock Company

Address: No.18, Baoqiao Road, Huaxi Street, Changxing County, Huzhou City, Zhejiang Province

Telephone number of the supplier: 86-572-6216020

E-mail address: subaoliang@tnsaft.com

Emergency telephone number

Company Emergency Phone Number: 86-572-6216020

Section 2. Hazard(s) identification

Classification

No harm at the normal use. If contact the Electrolyte in the Lithium-ion Battery, reference as follows:

Classification of the substance or mixture

Classification according to GHS

Acute Toxicity, Oral(Hazard category 4)

Acute Toxicity, Dermal(Hazard category 3)

Skin, irritate(Hazard Category 1B)

Eye Irritate (Hazard category 1)

GHS Label elements, including precautionary statements:

GHS02



GHS05



GHS06

Signal word: Warning

Hazard statement(s):

H242:Heating may cause a fire;

H311: Toxic in contact with skin;

H314:Causes severe skin burns and eye damage;

H302:Harmful if swallowed;

H319:Causes serious eye irritaion

H351:Suspected of causing cancer

H317:May cause an allergic skin reation

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.

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

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

P272 Contaminated work clothing should not be allowed out of the workplace.

Response:

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

P302+P350-IF ON SKIN: Gently wash with plenty of soap and water

P301+P330+P331-IF SWALLOWED: rise mouth. Do NOT induce vomiting

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/attentionP308+P313 If exposed or concerned: Get medical advice/attention

P302+P352 if ON SKIN: Wash with plenty of water

P333+P313 If skin irritation or rash occurs: Get medical advice/attention

P321 Specific treatment(see....on this label)

P362+P364 Take off contaminated clothing and wash it before reuse.

Storage:

P405 Store locked up.

Disposal

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

Hazards not otherwise classified (HNOC)

Not Applicable

Other information

No information available.

Section 3. Composition/Information on Ingredients

Chemical characterization: Mixtures

Description:

Product: Consisting of the following components.

Chemical Name	Concentration%	CAS No.	EC No.
Lithium Iron Phosphate	23.97	15365-14-7	/
Iron	15.31	7439-89-6	231-096-4
Graphite	12.00	7782-42-5	231-955-3
Styrene polymers	8.02	66070-58-4	/
Dimethyl carbonate	7.37	616-38-6	210-478-4
Acrylonitrile	5.9	107-13-1	203-466-5
Copper	5.78	7440-50-8	231-159-6
1, 3-Butadiene	5.67	106-99-0	203-450-8
Aluminium	3.05	7429-90-5	231-072-3

Propylene carbonate	2.905	108-32-7	203-572-1
Lithium hexafluorophosphate	1.69	21324-40-3	244-334-7
Polyethylene	1.55	9002-88-4	618-339-3
Ethyl methyl carbonate	1.43	623-53-0	613-014-2
Acrylonitrile - butadiene - styrene polymer	1.245	9003-56-9	618-371-8
Polyethylene Terephthalate	1.19	25038-59-9	607-507-1
Ethylene carbonate	0.77	96-49-1	202-510-0
Carbon	0.65	7440-44-0	231-153-3
Polyvinylidene fluoride	0.63	24937-79-9	200-867-7
Nickel	0.35	7440-02-0	231-111-4
Styrene Butadiene Rubber	0.25	9003-55-8	618-370-2
Carboxymethyl cellulose sodium	0.17	9004-32-4	618-378-6
Carbon nanotubes	0.13	68647-86-9	271-974-4

Note: CAS number is Chemical Abstract Service Registry Number.

Section 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

Section 5. Fire-Fighting Measures

Suitable Extinguishing Media

When the scale of the fire is small, use a HFC (hydrofluorocarbon) clean-agent fire extinguisher or alcohol resistant foam fire extinguishers. (In case of battery overheating, wear protective gear and immerse heated battery in water)

In case of large fire, use large amount of water to extinguish.

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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 hazardous 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°C), 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.

Section 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.

Section 7. Handling and Storage

Precautions for safe handling

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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-ion Battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium-ion Polymer Battery periodically.

3 months: -10°C~+40°C, 45 to 85%RH

And recommended at 0°C~+35°C for long period storage.

The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.

The voltage for a long time storage shall be 3.7V~4.2V(cell) range.

Do not storage Lithium-ion Battery 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-ion Polymer Battery 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.

Section 8. Exposure Controls/Personal Protection

Control parameters

Ingredients with limit values that require monitoring at the workplace:	
15365-14-7 Lithium Iron Phosphate	
TLV (USA)	N/A
MAK (Germany)	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

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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 through 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.

Section 9. Physical and Chemical Properties

Physical State	Form: Prismatic	
	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.

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Auto-ignition temperature	Product is not self-igniting.
Decomposition temperature	Not determined.
Odour threshold	Not determined.
Evaporation rate	Not determined.
Viscosity	Not determined.
Other Information	No further relevant information available.

Section 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.

Section 11. Toxicological Information

Acute toxicity: 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 (carcinogenetic, mutagenicity and toxicity for reproduction): No information available.

Section 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.

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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.

Section 13. Disposal Considerations

Safe handling and methods of disposal

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

Product disposal recommendation: Observe local, state and federal laws and regulations.

Packaging disposal recommendation: Be aware discarded batteries may cause fire, tape the battery terminals to insulate them. Don't disassembly the battery. Completely discharge containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations. The potential effects on the environment and human health of the substances used in batteries and accumulators; the desirability of not disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection so as to facilitate treatment and recycling.

Section 14. Transport Information

Only Lithium Battery during Transport:

The product has passed the test items of Manual of Tests and Criteria Section 38. 3.

RID/ADR(2023 Edition):

Hazard Class: 9

UN Number: UN3480

Proper Shipping Name: Lithium ion batteries

According to 2.2.9.1.7(g), Manufacturers and subsequent distributors of cells or batteries manufactured shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5.

IATA DGR(65th Edition):

Hazard Class: 9

UN Number: UN3480

Proper Shipping Name: Lithium ion batteries

The product shall meet the General Requirements and section IA of Packaging Instruction 965.

According to 3.9.2.6.1(g), Manufacturers and subsequent distributors of cells or batteries manufactured after 30 June 2003 shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5.

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IMO IMDG CODE(2022 Edition):

Hazard Class: 9

UN Number: UN3480

Proper Shipping Name: Lithium ion batteries

EmS Number: F-A, S-I

According to 2.2.9.1.7(g), Manufacturers and subsequent distributors of cells or batteries manufactured shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5.

Section 15. Regulatory Information

Domestic Regulations:

Only Lithium Battery during Transport:

Regulations Concerning Road Transportation of Dangerous Goods (JT/T 617-2018) :

UN Number: 3480

Name and Description: Lithium ion batteries

List of Dangerous Goods (GB 12268-2012) :

UN Number: UN3480

Shipping Name: Lithium ion batteries

Packing Group: II

List of Dangerous Goods by Rail (2009 Edition) :

Number: 91013

Name of Product: Lithium batteries

International Regulations:

Directive 2006/66/EC and 2013/56/EU:

The label, disposal and recycling of the battery shall meet the requirements of EU Directive 2006/66/EC and 2013/56/EU.

ICAO TI:

1. Unless be exempted according to ICAO TI, the lithium ion cell/batteries (UN 3480, PI 965) and lithium metal cell/batteries(UN 3090, PI 968) are forbidden for carriage on passenger aircraft.
2. Unless be approved according to ICAO TI, Lithium ion cells/batteries (UN3480, PI 965) must be of fered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.

Section 16. Other Information

Preparation and revision information

Date of previous revision: Not applicable.

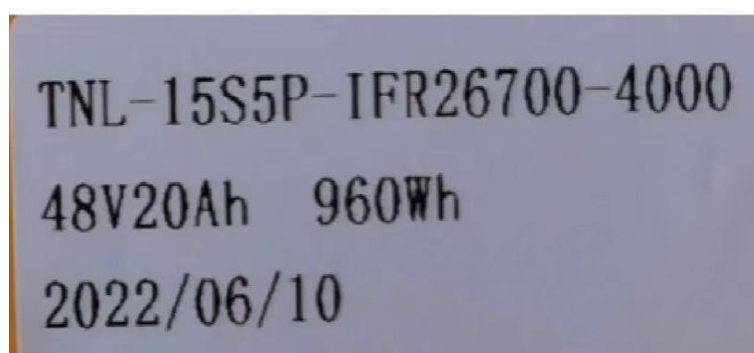
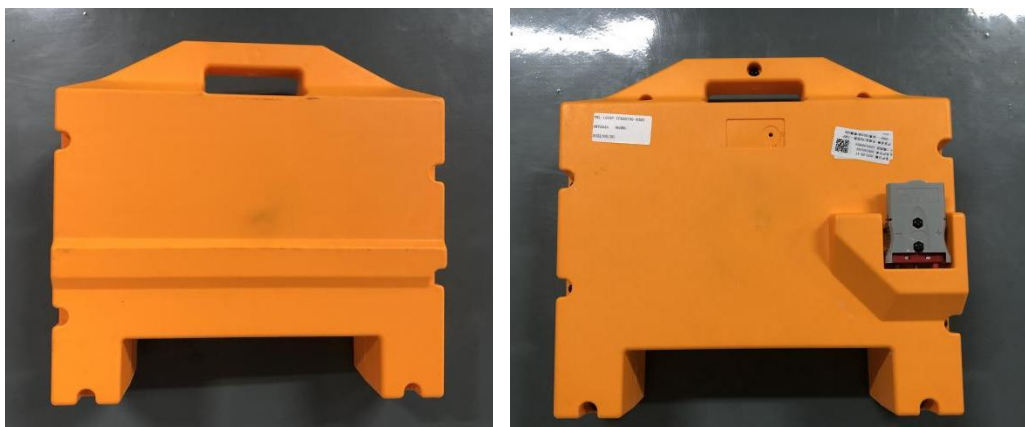
Revision summary: The first New SDS

Abbreviations and acronyms

TSCA:	Toxic Substances Control Act, The American chemical inventory.
DSL:	Domestic Substances List
EINECS:	European Inventory of Existing Commercial chemical Substances
ENCS:	Japanese Existing and New Chemical Substances
ECL:	Existing Chemicals List, the Korean chemical inventory
IECSC:	Inventory of existing chemical substances in China.

Disclaimer

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard. The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.



-- End of Report --