



Solquartz Pty Ltd C/- Private Energy Partners Pty Ltd
Level 4, 167 Eagle Street,
Brisbane,
Queensland 4000

Attention: Greg Connors

29th October 2025

RE: Solquartz - Hazardous Chemicals Thresholds

Dear Greg,

Thank you for requesting Mendham Consultants (MC) assistance for the Solquartz BESS Project in relation to hazardous chemicals storage threshold assessment.

The assessment has been undertaken by Hugo Mak (BEng Hons. and Member of the AIDGC) and reviewed by Dr Frank Mendham (AIDGC accredited dangerous consultant and Registered Professional Engineer of Queensland (RPEQ)).

Background

Lithium metal and lithium-ion batteries are recognised as Class 9 miscellaneous dangerous substances and articles according to the *Australian Code for the Transport of Dangerous Goods by Road and Rail* [1], batteries are a Class 9 dangerous good.

The purpose of this assessment is to determine the quantity of hazardous chemicals that are stored on site and compare it to the Schedule 15 threshold quantities of the Work Health and safety Regulation (Qld) 2011 [3].

Industry Threshold Assessments

As the project is in the State of Queensland, the following documents must be assessed: -

1. Work Health and Safety Regulation (Qld) [3].
2. Planning Guideline State Code 21: Hazardous Chemicals facilities [4].

Table 1: Relevant Planning Instruments and industry thresholds [3].

Item Number	Planning Instrument	Dangerous Goods Class / Hazardous Chemicals	Threshold (t/kg) [3]	Notes
1	Schedule 15 – Queensland Work Health and Safety Regulation (2011)	9 - Miscellaneous dangerous substances and articles	Not assessable	Class 9 articles are not assessable under Schedule 15.
		3 – Flammable Material constituents	50,000 / 50,000,000	Class 3 materials are assessable under Schedule 15.
		Hydrotreated Vegetable Oil (HVO)	50,000 / 50,000,000	Class 3 materials are assessable under Schedule 15.
		Midel 7131 Ester Fluid	Not assessable	Not assessable under Schedule 15.
		6.1 - Toxic solids and liquids constituents	20 / 20,000 (Very Toxic)	Class 6.1 materials are assessable under Schedule 15.



Item Number	Planning Instrument	Dangerous Goods Class / Hazardous Chemicals	Threshold (t/kg) [3]	Notes
			200 / 200,000 (Toxic)	

BESS Unit Assessment Against Schedule 15 (10%)

The following assessment is based on not exceeding a 10% Major Hazard Facility threshold [3] as detailed in SARA Planning Guideline State Code 21: Hazardous Chemicals facilities [4] for Table 1 Item 3 noting that the WHS assessment against Schedule 15 Table 15.1 requires that: -

- (1) *"The UN Number listed against the named hazardous chemical does not restrict the meaning of the name, which also applies to hazardous chemicals that fall outside the UN number. Examples: The hazardous chemicals are part of mixtures covered by different UN numbers."*

The assessment used the CATL Safety Data Sheet [5] (refer Appendix 2) provided by the Client. The following assumptions / information from the SDS was extracted to undertake the assessment: -

1. One (1) CATL BESS Unit weighs approximately 45,000 kg.
2. The weight of the 'Battery' was assumed to be 60% of the total weight.
3. The 'Battery' comprised of electrolyte, which contains hazardous chemicals which conservatively comprise 20% of the 'Battery' weight.

See Appendix 1 of the Dangerous Goods Worksheet.

From the individual chemical constituent Safety Data Sheets based on the chemicals described in [5], the following are noted: -

1. Three (3) of these hazardous chemicals (Dimethyl Carbonate [6], Diethyl Carbonate [7], Ethyl Methyl Carbonate [8]) are classified as Flammable – Class 3.
2. Lithium Hexafluorophosphate is classified as Toxic – Class 8 (6.1) [9].

Hydrotreated Vegetable Oil (HVO)

The project has proposed the use of Hydrotreated Vegetable Oil (HVO), which is also known as Renewable Diesel. Based on the requirement of the number of BESS units, the project has estimated that 240,000L of HVO will be required during operation.

Typically, HVO is considered as a 'Diesel Fuel', which has the classification of Class 3 (Flammable Liquid) Packing Group III hazardous chemical [11]. This information was previously provided by a related project.

The following estimates the quantity of HVO in weight for the Schedule 15 Assessment: -

Chemical / Product Name	Quantities
HVO	240,000L (184,724 kg) [based on estimated density of HVO @ 769.68kg/m ³]

Flammable Class 3 Assessment

Electrolytes from BESS units are composed of the following flammable Class 3 chemicals: -

<u>Chemical Name</u>	<u>Description</u>	<u>Packing Group</u>	<u>Electrolyte Percentage (%)</u>	<u>Electrolyte Mass (kg) / BESS</u>
Dimethyl Carbonate	Class 3 – Flammable	II	15	810
Diethyl Carbonate	Class 3 – Flammable	III	15	810
Ethyl Methyl Carbonate	Class 3 – Flammable	III	15	810



<u>Chemical Name</u>	<u>Description</u>	<u>Packing Group</u>	<u>Electrolyte Percentage (%)</u>	<u>Electrolyte Mass (kg) / BESS</u>
	Total Flammable Class 3 per BESS			2,430

Schedule 15, Table 15.2 [3] lists the threshold for 'Liquids that meet the criteria for class 3 packing group II or III' as 50,000 tonnes (50,000,000 kg). A 10% Major Hazard Facility Threshold (State Code 21) [4] is then 5,000,000 kg.

Based on the information provided by the client, it has been proposed that approximately 1,170 CATL BESS units are connected onsite. The estimated weight of flammable liquids from the BESS units is 2,843,100 kg and from the HVO is 184,724 kg, which would have a total weight of 3,027,824 kg of flammable liquids.

The flammable liquids proposed to be onsite does not exceed the 10% Major Hazard Facility Threshold [4].

Toxic Class 6.1 Assessment

The toxic component of the cells is not assessable under the applicable regulatory requirement [3] for the following reasons: -

BESS electrolytes are composed of the following Toxic Class 6.1 chemical: -

<u>Chemical Name</u>	<u>Description</u>	<u>Packing Group</u>	<u>Electrolyte Percentage (%) / Cell</u>	<u>Electrolyte Mass (kg) / BESS</u>
Lithium Hexafluorophosphate	Class 6.1 – Toxic	I	15	810
	Total Toxic Class 6.1 per BESS Unit			810

Schedule 15, Table 15.3 [3] identifies the following Criteria for very toxic and toxic chemicals. The Lithium Hexafluorophosphate is included for comparison.

Source / Description	Oral Toxicity ¹ LD50 (mg/kg)	Dermal Toxicity ² LD50 (mg/kg)	Inhalation Toxicity ³ LC50 (mg/L)
Schedule 15 / Very Toxic	LD50 ≤ 5	LD50 ≤ 40	LC50 ≤ 0.5
Schedule 15 / Toxic	5 < LD50 ≤ 50	40 < LD50 ≤ 200	0.5 < LC50 ≤ 2
Safety Data Sheet – Lithium Hexafluorophosphate [11].	> 50 – 300 (Rat)	Not listed	Not listed

1 in Rats

2 in rats or rabbits

3 four hours in rats

As the table above demonstrates, Lithium Hexafluorophosphate is below the very toxic and toxic thresholds described in Schedule 15, Table 15.3 [3] and therefore requires no further assessment.

Power Transformer – Midel 7131 Ester Fluid

The project includes the use of three (3) Power Transformers, which require the use of approximately 1,016,400L of Midel 7131 Ester Fluid. From the Safety Data Sheet (provided by a previous related project), it has been indicated that Midel 7131 Ester Fluid is not considered a dangerous goods [10] and therefore not assessed under Schedule 15 of the WHS Regulation [3].

Conclusion

Based on data sources listed herein and calculations based on these, the following conclusions are reached: -



1. Electrolytes from the BESS units that contain Class 3 – Flammable liquids and are assessable under Schedule 15, Work Health and Safety Regulation (2011) [3].
2. Hydrotreated Vegetable Oil (HVO) is typically considered a Class 3 Packing Group III Flammable Liquid and are assessable under Schedule 15 [3].
3. The Assessment against this Regulation in relation to the flammable materials identified that a total of 3,027,824 kg of flammable liquids may be located onsite, which remains under the 10% Major Hazard Facility requirements of State Code 21.
4. Cells contain Class 6.1 – Toxic materials. The Toxic material listed in the Safety Data Sheet identified that Lithium Hexafluorophosphate [9] does not meet the Very Toxic or Toxic criteria and therefore does not require further consideration.
5. Midel 7131 Ester Fluid is not assessed under Schedule 15 of WHS Regulation [3] and therefore does not require further consideration.

In summary, the site is not considered as a Hazardous Chemicals Facility based on the definitions provided in State Code 21 [4], as the hazardous chemicals volume does not exceed the 10% threshold quantity.





References

- [1] Australian Code for the Transport of Dangerous Goods by Road and Rail Ed 7.7, 2020, National Transport Commission, Sydney, Australia.
- [2] UL9540A, 2019, Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.
- [3] Work Health and Safety Regulation (Qld), 2011, Qld Government, Brisbane, Australia
- [4] SARA Planning Guideline State Code 21: Hazardous Chemicals facilities, 2017, Qld Government, Brisbane, Australia.
- [5] Safety Data Sheet, CATL, Version: 1.7, Doc No: 2025-A-012, Issue Date: 1/14/2025.
- [6] Safety Data Sheet, Dimethyl Carbonate, ThermoFisher Scientific, Revision Date 26/12/2021, Rev 5.
- [7] Safety Data Sheet, Diethyl Carbonate, ThermoFisher Scientific, Revision Date 28/12/2021, Rev 4.
- [8] Safety Data Sheet, Ethyl Methyl Carbonate, Chemical Book, Revision Date 20/10/2024, Rev 1.
- [9] Safety Data Sheet, Lithium Hexafluorophosphate, ThermoFisher Scientific, Revision Date 24/12/2021, Rev 5.
- [10] Safety Data Sheet, Midel 7131, Midel, Date: April 2020.
- [11] Safety Data Sheet, Renewable hydrocarbons (HVO), BP, Date of Issue: 6/07/23, Version 4.





Appendix 1 – Dangerous Goods Worksheet

Estimated Weight of BESS Unit	45,000	Total Weight of BESS
Estimated Weight of Battery per BESS Unit	27,000	60% of Weight
Estimated Weight of Electrolytes per Battery per BESS Unit	5,400	20% Weight of Battery
No. of BESS Units	1,170	
Estimated Weight of Electrolytes per Installation = 5400 x 1170	6,318,000	5,400 x 1,170
Total UN2923 (kg)	947,700	0.15* Total Electrolytes
Total UN1161 (kg)	947,700	0.15* Total Electrolytes
Total Not Listed (kg)	947,700	0.15* Total Electrolytes
Total UN2366 (kg)	947,700	0.15* Total Electrolytes
Total UN3272 (kg)	947,700	0.15* Total Electrolytes
Total Undefined (kg)	1,579,500	0.25* Total Electrolytes
Total	6,318,000	Total

Cell Electrolyte Contents	Contents %/wt	UN Number	Dangerous Goods Class	Packing Group	Total
Lithium Hexafluorophosphate	0.15	2923	8 (6.1) Corrosive	i	947,700
Dimethyl Carbonate	0.15	1161	3 Flammable	iii	947,700
Ethylene Carbonate	0.15	Not listed	Not Classified DG	N/A	947,700
Diethyl Carbonate	0.15	2366	3 Flammable	iii	947,700
Ethyl Methyl Carbonate	0.15	3272	3 Flammable	iii	947,700



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Safety, Risk and Reliability
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Appendix 2 - CATL BESS Unit Safety Data Sheet



MATERIAL SAFETY DATA SHEET

物料安全技术说明书

Version : 1.7

Doc No.: 2025-A-012

Issue Date: 1/14/2025

1. Product & Company Identification

Product name	Containelized Lithium Ion Battery Storage System	CATL Product Model No.	C060102
Manufacturer	Contemporary Amperex Technology Co., Limited	Estimated weight	45000Kg
Rated capacity	4240Ah	Rated voltage	1331V
address	No.2 Xingang Road, Zhangwan Town, Jiaocheng District, Ningde City, Fujian Province, China, 352100		
Contact number	+86-593-2583668		
Application	Power grid service, industrial and commercial energy storage		

2. Hazardous Identification

Lithium ion batteries described in this SDS are hermetically sealed and designed to withstand temperatures and pressures encountered during normal use. Under normal conditions of use, there is no physical danger of ignition, explosion or chemical danger of hazardous materials leakage. The materials contained in this battery may only represent a hazard if the integrity of the battery is compromised or if the battery is mechanically, thermally or electrically abused.

Hazard Classification: Flammable gas, causes severe dermal, eye and inhalation damage

Signal Word: Danger

GHS Hazard Statements: If the integrity of the intact product is physically, thermally, or electrically compromised, flammable and toxic gases and vapors may be liberated. Harmful if swallowed. Harmful if inhaled. Causes skin damage. Causes serious eye damage. Causes damage to organs (bones, teeth) through prolonged or repeated exposure. May cause damage to organs (kidneys) through prolonged or repeated exposure by ingestion.

H227 Combustible Liquid

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H360 May damage fertility or the unborn child

Pictograms:



Precautionary Statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.



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P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting] equipment

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

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

P403 + P235 Store in a well-ventilated place. Keep cool.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

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

P302 + P361 + P354 IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.

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

P305 + P354 + P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P264+P265 Wash hands thoroughly after handling. Do not touch eyes.

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

P319 Get medical help if you feel unwell.

3. Composition /Information on Ingredients

3.1 Composition of pack

Material or ingredient	%/wt.
Battery outer box, metal bracket and control system	35-45
Battery (see Table 3.2 below for battery composition)	55-65

3.2 Composition of battery

Material or ingredient	CAS No./EC No.	Hazard pictograms & statements	%/wt.
Graphite	CAS # 7782-42-5 EC # 231-955-3	Not classified	7-25
Lithium iron Phosphate	CAS# 15365-14-7 EC# 604-917-2	Not established	15-40
Polyvinylidene fluoride	CAS # 24937-79-9 EC # 607-458-6	Not classified	0-5
Acetylene Black	CAS # 1333-86-4 EC # 215-609-9	Not classified	0-2
Copper	CAS # 7440-50-8 EC # 231-159-6	Not classified	10-12
Aluminum	CAS # 7429-90-5 EC # 231-072-3	Not classified	3-5
Carboxymethylcellulose sodium	CAS # 9004-32-4 EC # 618-378-6	Not classified	0-5
Electrolyte	NA	See 3.3 Table of Main Substances of Electrolyte	3-20



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3.3 Electrolyte Composition Table

Material or ingredient	CAS No./EC No.	Hazard pictograms & statements	%/wt.
Lithium hexafluorophosphate	CAS # 21324-40-3 EC # 244-334-7	 Skin Corr. 1A, H314  Acute Tox. 4, H302  STOT RE 1, H372	5-15
Dimethyl carbonate	CAS # 616-38-6 EC # 210-478-4	 Inflammable, H225	0-15
Ethylene carbonate	CAS # 96-49-1 EC # 202-510-0	 Eye Irrit. 2, H319  Acute Tox. 4, H312	0-15
Diethyl carbonate	CAS # 105-58-8 EC # 203-311-1	 Flam. Liq. 3, H226	0-15
Ethyl methyl carbonate	CAS # 623-53-0 EC # 433-480-9	 Inflammable, H225  Skin Irrit. 2, H315	0-15

4. First Aid Measures

Intact lithium ion batteries do not represent an immediate health hazard. Exposure to the chemical constituents inside the battery caused by significant physical, thermal, or electrical abuse resulting in the battery casing being compromised may cause severe eye irritation with symptoms such as stinging, tearing, redness, swelling and blurred vision. Dusts, mists, or vapors may irritate the respiratory tract, skin and eyes or cause coughing. Skin irritation, redness and pain may also occur.

After skin contact: To chemical constituents from a compromised battery, remove contaminated clothing and immediately wash skin with soap and water. If skin irritation occurs, seek medical attention. Wash contaminated clothing before reuse.

After eye contact: To chemical constituents from a compromised battery, do not rub eyes. Immediately flush with water for at least 15 minutes. Remove contact lenses. Seek medical attention immediately.

After inhalation: To dusts, vapors or mists from a compromised battery, move to fresh air. Give oxygen if necessary. Seek medical attention if symptoms develop or persist.

After swallowing: Contents of a compromised battery, do not induce vomiting unless directed by medical professionals. If conscious, rinse mouth with water and give small quantities of water. Cease giving water if exposed person feels sick. If vomiting occurs, keep head low to minimize aspiration into lungs. Seek medical attention. If unconscious, place individual in recovery position and seek medical attention. Maintain an open airway and loosen tight clothing.

5. Fire Fighting Measures

Suitable extinguishing media: Intact lithium ion batteries do not represent an immediate fire hazard. If the battery is subject to significant physical, thermal, or electrical abuse a thermal runaway event can occur resulting



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in a fire. During a thermal runaway event, a lithium ion battery can reach temperatures of 700° C (1292° F) resulting in a rapid disassembly of the battery that may include fractured battery cells being ejected from the battery.

Copious amounts of water spray and/or complete immersion into water can be used to effectively extinguish a lithium ion battery fire, reduce the temperature of the battery, and contain a thermal runaway event. Dry chemicals take second place, while CO2 extinguishers are least effective in controlling a lithium ion battery fire.

Unsuitable extinguishing media: No additional information available.

Specific hazards arising from chemicals: Fire, excessive heat and/or over voltage conditions may liberate flammable and toxic gases (i.e. hydrogen, dimethyl carbonate, hydrogen fluoride), and eventually cause product ignition.

Hazardous Decomposition Products: May decompose upon heating and burning. Fire may produce toxic gases or fumes.

Special protective equipment and advice for firefighters: Use a positive pressure self-contained breathing apparatus if batteries are involved in fire. Full protective clothing is necessary. During water application, pay attention to burning pieces of flammable particles may be ejected from the fire.

6. Accidental Release Measures

Personal precautions non-emergency: Handling of intact lithium ion battery refer to Section 8 for PPE.

Personal precautions emergency response: Rapidly evacuate people from the contaminated area to a safe area and isolate and strictly limit access. Cut off the source of ignition and the source of leakage as far as possible.

Measures for environmental protection: Prevent dispersal of spilled material and runoff to soil, waterways, drains and sewers. Absorb liberated materials with non-combustible absorbent material.

Measures for cleaning/collecting:

Small spill: Absorb spill residue with sand, vermiculite or other inert materials, collect and transport to an open area for burial, evaporation, or burning.

Large spill: Construct an embankment or dig a pit to receive it. Cover with foam to reduce vapour hazard. Transfer to a tanker or special collector with an explosion-proof pump for recycling or transport to a waste disposal site.

7. Handling & Storage

Handling of intact lithium ion batteries: Lithium ion batteries are designed to be recharged. Use only approved chargers and procedures. Do not charge above specified rate. Improper charging may cause the battery to catch fire and/or vent flammable and toxic gases.

Do not allow conductive material to touch the battery terminals. A dangerous short circuit may occur and cause battery failure and fire. Do not open, disassemble, crush, or burn batteries. Do not expose to extreme heat or fire. Protect case from puncture and damage.

In case of rupture, handle in accordance with good industrial hygiene and safety practices. Avoid contact with skin, eyes or clothing. Use appropriate personal protection equipment.

Storage of intact lithium ion batteries: Keep the battery away from source, open fire, strong oxidant, strong acid, moisture, food and beverage, and leave enough space between the battery and the wall; Do not store the battery 55°C(131° F) or below -30°C(-22° F). High temperature storage may discharge flammable liquids and



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gases from the guide tank; The battery should be stored in a well ventilated and cool place (below 30°C, 86 °F), in which the shortening of battery life caused by high temperature storage can be avoided.. See also following codes and standards:

- 2024 International Fire Code
- 2024 International Building Code
- SAE J3235 - Best-Practices for Storage of Lithium ion Batteries

Handling and storage of compromised lithium ion batteries: Don appropriate PPE as release of dangerous substances and flammable and toxic gases are possible. Isolate batteries from other materials and place in designated containers, packages and/or rooms. Batteries may be submerged in water during storage to mitigate energy discharge and rupture. Rooms and containers should include early detection, mitigation, and suppression systems that are designed to accommodate specific lithium ion battery sizes and chemistries.

8. Exposure Control & Personal Protection

8.1 Engineering controls

Engineering controls for intact lithium ion battery: Use with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below recommended or statutory limits.

Engineering controls for compromised lithium ion battery: Use explosion proof exhaust ventilation with rates appropriate for conditions.

8.2 Individual protective measures, personal protective equipment

General protective and hygienic measures: Wash thoroughly after handling and before eating, drinking and smoking. Remove potentially contaminated clothing and wash before reuse.

Respiratory protection for compromised lithium ion battery: Use NIOSH approved respirator if ventilation is inadequate. SCBA for emergency responders. Must be used in accordance with an OSHA complaint respiratory protection program.

Hand and skin protection for compromised lithium ion battery: Chemical-resistant, impervious, and thermal rated gloves should be worn when handling. Discard contaminated gloves and wash contaminated clothing before reuse.

Face/Eye protection for compromised lithium ion battery: Use ANSI-rated eyewear to avoid exposure to liquid splashes, mists, dust or flying particles and components.

Control Parameters: Exposure limit values of other components are as follow.

Chemical name	CAS#	OSHA PEL	OSHA Ceiling	ACGIH TLV	ACGIH Ceiling	NIOSH REL
Graphite	7782-42-5	15 mppcf	None	2 mg/m ³ (resp., natural, all forms except fibers)	None	2.5 mg/m ³ (resp)
Lithium iron phosphate	15365-14-7	None	None	None	None	None
Polyvinylidene Fluoride	24937-79-9	None	None	None	None	None
Acetylene black (Carbon black)	1333-86-4	3.5 mg/m ³	None	3 mg/m ³ inhalable	None	3.5 mg/m ³



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Copper	7440-50-8	0.1 mg/m ³ fume; 1 mg/m ³ dust/mist	None	0.2 mg/m ³ fume; 1 mg/m ³ dust/mist	None	0.1 mg/m ³ fume 1 mg/m ³ dust/mist
Aluminum	7429-90-5	15 mg/m ³ total dust; 5 mg/m ³ resp. dust	None	1 mg/m ³ resp. dust	None	10 mg/m ³ (total) 5 mg/m ³ (resp)
Carboxymethylcellulose Sodium	9004-32-4	None	None	None	None	None
Lithium hexafluorophosphate	21324-40-3	None	None	None	None	None
Dimethyl carbonate	616-38-6	None	None	None	None	None
Ethylene carbonate	96-49-1	None	None	None	None	None
Diethyl carbonate	105-58-8	None	None	None	None	None
Ethyl methyl carbonate	623-53-0	None	None	None	None	None

9. Physical & Chemical Properties

Appearance (physical state, color, etc.): Solid.

Odor: Not applicable

Odor threshold: Not applicable

pH: Not applicable

Melting point/melting range: Not applicable

Boiling point/boiling range: Not applicable

Flash point: Not applicable

Evaporation rate: Not applicable

Flammability: Not applicable

Upper/lower flammability or explosive limits: Intact lithium ion batteries are stable, however, exposure to high temperatures (e.g., above 150°C/302°F) or a thermal event may liberate hydrogen gases.

Auto ignition temperature: Not applicable

Danger of explosion: Intact lithium ion batteries are stable. However, exposure to heat or a thermal event may liberate hydrogen gases resulting in a rapid disassembly of the battery.

Vapor pressure: Not applicable

Vapor density: Not applicable

Relative density: Not applicable

Solubility in/Miscibility with water: Insoluble

10. Stability & Reactivity

Reactivity: No specific test data available for the reactivity of lithium ion battery.

Chemical stability: Intact lithium ion batteries are stable. Compromised lithium ion battery may liberate



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flammable gas mixture.

Possibility of Hazardous Reaction: Electrolyte and electrode may react with water and moisture.

Conditions to avoid: Do not allow conductive material to touch terminals as short circuiting may occur resulting in lithium ion battery failure and fire. Do not puncture, disassemble, or expose to heat or high temperatures. Keep away from sparks or flames. Do not exceed manufacturer's recommendations for charging or use for applications for which product is not specifically designed.

Incompatible materials: Avoid contact with acids or oxidizers. Keep away from water due to potential violent reaction and possible flash fire.

Hazardous decomposition products: Compromised lithium ion batteries may liberate irritating and toxic gases from decomposition by heat and combustion if burned; corrosive or toxic fumes may also be generated.

11. Toxicological Information

Intact lithium ion batteries do not have known toxicological risks.

Routes of exposure and potential health effects of chemical mixture¹ from compromised lithium ion battery:

Skin: Causes irritation and/or thermal burn.

Eye: Irritation, redness, watering, and potential injury resulting in permanent vision impairment or chemical burn.

Inhalation: Dust, vapor and fumes may irritate the respiratory system. Prolonged inhalation may be harmful.

Ingestion: Not anticipated to be a route of occupational exposure.

Acute toxicity: Compromised lithium ion batteries may liberate carbon oxides, hydrogen and/or hydrogen fluoride. No testing has been conducted for chemical mixtures. Individual component information is provided as guidance in section 3.

12. Ecological Information

When properly used and disposed, the battery does not present environmental hazard. Do not let internal components release into the environment, including water, soil and air.

Ecotoxicity: The electrolyte from a compromised battery may be toxic to aquatic environment.

Aquatic toxicity: No information available.

Persistence and degradability: No information available.

Bioaccumulative potential: No information available.

Mobility in soil: No information available.

13. Disposal Considerations

Batteries should be discharged fully prior to disposal. Disposal the batteries in accordance with applicable local laws. Lithium-ion batteries may be subjected to federal, state or local regulations.

14. Transport Information

Land transportation: International Carriage of Dangerous Goods by Road (ADR), Regulations on International Carriage of Dangerous Goods by Rail (RID).

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Maritime transport: International Maritime Dangerous Goods Code (IMDG CODE).

Air transport: International Civil Aviation Organization-Technical Directive for Safe Transport of Dangerous Goods by Air (ICAO-TI) and International Air Transport Association-Dangerous Goods Regulations (IATA-DGA).

Inland waterway transport: Regulation on the Safety Supervision and Control of Dangerous Goods on Ships, European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN).

Others: Model Regulations of the United Nations Recommendations on the Transport of Dangerous Goods (TDG), Manual of Tests and Criteria of the Model Regulations of the Recommendations on the Transport of Dangerous Goods

Mode of transport	Land transportation (ADR/RID)	Sea transportation (IMDG)	Shipping (ICAO/IATA)
UN number	3536	3536	N/A
Shipping name	Containelized Lithium Ion Battery Storage System	Containelized Lithium Ion Battery Storage System	N/A
Transportation hazard level	9	9	N/A
Packing instructions	SP389	SP389	N/A
Label			
Matters needing attention	- The transported batteries need to pass the UN38.3 experimental test. - The package shall withstand a 1.2 m drop test of any orientation without damaging the batteries in the package, changing the position of the batteries in the package so that they contact each other and no batteries leak out of the package. - Cells must not be damaged or mishandled. If they are damaged, they must be isolated, inspected and repackaged. - Comply with the special provisions of international regulations on the packaging of lithium batteries or lithium battery packs.		

15. Regulatory Information

15.1 United States Federal Regulations

Occupational Safety and Health Act (OSHA): Employers/enterprises must ensure that lithium batteries, chargers and lithium-ion-related equipment used in the workplace are tested according to appropriate testing standards (such as UL 2054) and certified by testing institutions with NRTL (Nationally Accredited Testing Laboratory) qualification.



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Toxic Substances Control Act (TSCA): This product is not listed.

Clean Air Act (CAA): This product is not included.

Clean Water Act (CCW): This product is not listed.

California Code of Regulations (CCR), Title 8, Section 339:

Graphite	7782-42-5
Acetylene black (Carbon black)	1333-86-4
Copper	7440-50-8
Aluminum	7429-90-5
Lithium hexafluorophosphate	21324-40-3

Cal Prop 65:

California Prop 65 components which are known to the state of California to cause birth defects or other reproductive harm:

Acetylene black (Carbon black)	1333-86-4
--------------------------------	-----------

TSCA Components: The lithium ion battery does not contain any components are regulated under a TSCA Section 5(e).

SARA 302 Components: The lithium ion battery does not contain any components with a section 302 EHS TPQ.

SARA 313 Components: The lithium ion battery does not contain any components which are subjected to reporting levels established by SARA Title III Section 313.

15.2 Canadian Regulations

Workplace Hazardous Goods Information System (WHMIS): This product is not included.

Hazardous Products Act (HPA): This product is not listed.

Canadian Environmental Protection Law (CEPA): This product is not listed.

15.3 German regulations

Regulations on Facilities for Handling Harmful Substances to Water (AwSV): The water hazard level of the electrolyte of this product is WGK 2 (Harmful to Water).

15.4 EU Regulations

It does not contain substances on REACH candidate list.

No REACH appendix XVII/XIV substances.

15.5 International Regulations

Australian List of Existing Chemicals (AICS): This product is not included.

List of Existing Chemical Substances in China (IECSC): This product is not listed.

List of Existing Chemical Substances in Japan (ENCS): This product is not listed.

List of Existing Chemical Substances in Korea (ISHL): This product is not listed.

New Zealand List of Existing Chemicals (NZLOC): This product is not listed.



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16. Other Information

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

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1. 产品及企业标识

产品名称	集装箱式储能系统	CATL 产品型号	C060102
制造商	宁德时代新能源科技股份有限公司	估计重量	45000
额定容量	4240Ah	额定电压	1331V
地址	中国福建省宁德市蕉城区漳湾镇新港路 2 号, 352100		
联系电话	+86-593-2583668		
应用程序	电网服务、工商业储能		

2. 危险性概述

本 SDS 中描述的锂离子电池是密封的, 设计用于承受正常使用过程中遇到的温度和压力。在正常使用条件下, 不存在着火、爆炸的物理危险和危险品泄漏的化学危险。只有当电池的完整性受到损害或电池在机械、热或电方面被滥用时, 电池中所含的材料才可能构成危险。

危害分类: 易燃气体, 造成严重的皮肤、眼睛和吸入伤害

信号词: 危险

GHS 危险声明: 如果完整产品的完整性在物理、热或电方面受到损害, 可能会释放出易燃和有毒气体和蒸气。吞食有害。吸入有害。导致皮肤损伤。造成严重的眼睛损伤。通过长时间或反复暴露对器官(骨骼、牙齿)造成损害。通过长期或反复摄入可能对器官(肾脏)造成损害。

H227 可燃液体

H315 引起皮肤刺激

H319 引起严重眼部刺激

H335 可能引起呼吸道刺激

H360 可能损害生育能力或未出生的孩子

象形图:



预防说明:

P210 远离热、热表面、火花、明火和其他点火源。禁止吸烟。

P233 保持容器密闭。

P240 研磨和粘合集装箱和接收设备。

P241 使用防爆[电气/通风/照明]设备

P242 使用无火花工具。

P243 采取措施防止静电放电。

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P280 佩帶防護手套/防護服/護眼/護臉/護耳。

P403+P235 保存在通风良好的地方，保持低温。

P260 不要吸入灰尘/烟雾/气体/薄雾/蒸汽/喷雾。

P301+P330+P331 如果不慎吞咽：及时漱口，不可催吐。

P302+P361+P354 如果不小心接触皮肤：立即脱掉所有污染的衣服，立即用水冲洗数分钟。

P304+P340 如果不小心吸入：将人移至新鲜空气中，保持呼吸畅通。

P305+P354+P338 如果不小心接触眼部：立即用清水冲洗数分钟。摘掉隐形眼镜，如果可以请保持持续冲洗。

P264+P265 接触后需彻底洗手，不要触碰眼睛。

P270 使用本品时请勿进食、饮水、吸烟。

P319 如果感到不适，请及时就医。

3. 成分信息

3.1 电池包组成

组成成分	%/wt.
电池外箱，金属支架及控制系统	35-45
电池（电池的组成见下表 3.2）	55-65

3.2 电池成分表

原料或配料	CAS No. /EC No.	危害象形图及危害说明	%/wt.
石墨	CAS# 7782-42-5 EC# 231-955-3	未被归类	7-25
磷酸铁锂	CAS# 15365-14-7 EC# 604-917-2	未被归类	15-40
聚偏二氟乙烯	CAS# 24937-79-9 EC# 607-458-6	未被归类	0-5
乙炔炭黑	CAS# 1333-86-4 EC# 215-609-9	未被归类	0-2
铜	CAS# 7440-50-8 EC# 231-159-6	未被归类	10-12
铝	CAS# 7429-90-5 EC# 231-072-3	未被归类	3-5
羧甲基纤维素钠	CAS# 9004-32-4 EC# 618-378-6	未被归类	0-5
电解液	NA	见 3.2 电解液主要物质成分表	3-20

3.3 电解液成分表

原料或配料	CAS No. /EC No.	危害象形图及危害说明	%/wt.
六氟磷酸锂	CAS# 21324-40-3 EC# 244-334-7	 Skin Corr. 1A, H314  Acute Tox. 4, H302  STOT RE 1, H372	5-15



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碳酸二甲酯	CAS# 616-38-6 EC# 210-478-4	 Inflammable, H225	0-15
碳酸乙烯酯	CAS# 96-49-1 EC# 202-510-0	 Eye Irrit. 2, H319  Acute Tox. 4, H312	0-15
碳酸二乙酯	CAS# 105-58-8 EC#203-311-1	 Flam. Liq. 3, H226	0-15
碳酸甲乙酯	CAS# 623-53-0 EC# 433-480-9	 Inflammable, H225  Skin Irrit. 2, H315	0-15

4. 急救措施

完整的锂离子电池不会立即危害健康。由于严重的物理、热或电气滥用而导致电池外壳受损，暴露在电池内部的化学成分中，可能会导致严重的眼睛刺激，出现刺痛、撕裂、红肿和视力模糊等症状。灰尘、雾气或蒸气可能刺激呼吸道、皮肤和眼睛或导致咳嗽。皮肤刺激，红肿和疼痛也可能发生。

皮肤接触后：接触受损电池中的化学成分，脱去污染的衣服，立即用肥皂和水清洗皮肤。如果出现皮肤刺激，请就医。清洗污染的衣物后再使用。

眼睛接触后：接触电池中的化学成分，不要揉眼睛。立即用水冲洗至少 15 分钟。取下隐形眼镜。立即就医。

吸入后：对于损坏的电池产生的灰尘、蒸汽或雾气，转移到新鲜空气中。必要时给氧。如果症状出现或持续，请就医。

吞咽后：不合格电池的内容物，除非有医疗专业人员的指导，否则不要催吐。如果意识清醒，用水漱口，并给予少量水。如果接触者感到不适，请停止给水。如果发生呕吐，保持头部低，以尽量减少吸入肺部。求医。如果失去知觉，将个人置于恢复位置并寻求医疗护理。保持气道开放，松开紧身衣物。

5. 消防措施

合适的灭火介质：完好无损的锂离子电池不代表立即发生火灾的危险。如果电池受到严重的物理、热或电滥用，就可能发生热失控事件，导致火灾。在热失控事件中，锂离子电池的温度可能达到 700° C (1292° F)，导致电池快速拆卸，可能包括断裂的电池单元从电池中弹出。

大量的喷水或完全浸入水中可用于有效地扑灭锂离子电池火灾，降低电池的温度，并遏制热失控事件。干燥剂排在第二位，而二氧化碳灭火器在控制锂离子电池火灾方面效果最差。

不适合的熄灭介质：没有其他可用的信息。

化学品引起的特殊危险：火灾、过热和/或过电压条件可能释放出易燃和有毒气体（即氢、碳酸二甲酯、氟化氢），并最终导致产品着火。

危险分解产物：加热和燃烧时可能分解。火灾可能产生有毒气体或烟雾。

消防队员的特殊防护设备和建议：如果电池卷入火灾，请使用正压式自给呼吸器。全套防护服是必要的。在用水时，注意燃烧碎片可能会从火中喷出可燃颗粒。



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6. 泄露应急措施

非紧急情况下的个人预防措施：处理完整的锂离子电池请参阅第 8 节的个人防护装备。

个人注意事项应急反应：迅速将受污染区域的人员疏散到安全区域，隔离并严格限制出入。尽可能切断点火源和泄漏源。

环境保护措施：防止溢出物和径流扩散到土壤、水道、下水道和下水道。用不可燃的吸收材料吸收释放的物质。

清洁/收集措施：

小泄漏：用沙子、蛭石或其他惰性物质吸收泄漏残留物，收集并运送到空旷处掩埋、蒸发或焚烧。

大泄漏：筑堤或挖坑接收。用泡沫覆盖以减少蒸汽危险。转移到装有防爆泵的罐车或专用收集器，以便回收利用或运送到废物处理场。

7. 操作处置和储存

处理完好无损的锂离子电池：锂离子电池被设计成可以再充电。只使用经批准的充电器和程序。不收取高于规定费率的费用。充电不当可能导致电池着火和/或排放易燃和有毒气体。

不要让导电材料接触电池端子。一个危险的短路可能发生，并导致电池故障和火灾。不要打开、拆卸、压碎或烧毁电池。不要暴露在酷热或烈火下。保护外壳不被刺穿和损坏。

如果发生破裂，应按照良好的工业卫生和安全惯例进行处理。避免接触皮肤、眼睛或衣物。使用适当的个人防护设备。

保存完好的锂离子电池：保持电池远离源头、明火、强氧化剂、强酸、潮湿、食品饮料，电池与墙壁之间留出足够的空间；不要将电池储存在 55°C（131 摄氏度）或 -30°C（-22 摄氏度）以下。高温储存可能会从导槽中排出易燃液体和气体；电池应存放在通风、阴凉的地方（30°C 以下，86° F），这样可以避免因高温储存而导致电池寿命缩短。另见下列守则和标准：

- 2024 年国际消防规范
- 2024 年国际建筑规范
- SAE J3235-锂离子电池储存的最佳规范

处理和储存受损的锂离子电池：避免使用适当的个人防护装备，因为可能会释放危险物质、易燃和有毒气体。将电池与其他材料隔离，并放置在指定的容器、包装和/或房间内。电池在储存过程中可能被淹没在水中，以减轻能量放电和破裂。房间和容器应该包括早期检测、缓解和抑制系统，这些系统旨在适应特定的锂离子电池尺寸和化学物质。

8. 接触控制和个体防护

8.1 工程控制



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完整锂离子电池的工程控制：在充分通风的情况下使用。使用工艺外壳、局部排气通风或其他工程控制措施，使工人接触空气污染物的程度低于推荐或法定限值。

对受损锂离子电池的工程控制：使用防爆排气通风，通风率适合条件。

8.2 个人防护措施、个人防护设备

一般防护及卫生措施：搬运后及进食、饮水、吸烟前彻底清洗。去除可能被污染的衣物并在重复使用前清洗。

对受损锂离子电池的呼吸保护：如果通风不足，请使用 NIOSH 认可的呼吸器。紧急救援人员的 scba。必须按照 OSHA 投诉呼吸保护计划使用。

受损锂离子电池的手部和皮肤保护：处理时应佩戴耐化学物质、不透水和耐热手套。丢弃受污染的手套，清洗受污染的衣物后再使用。

对受损锂离子电池的面部/眼睛保护：使用 ANSI 等级的眼镜，以避免暴露在液体飞溅、雾气、灰尘或飞行颗粒和组件中。

控制参数：其他成分的接触限值如下

化学成分	CAS#	OSHA PEL	OSHA 限值	ACGIH TLV	ACGIH 限值	NIOSH 限值
石墨	7782-42-5	15 mppcf	None	2 mg/m ³ (resp., natural, all forms except fibers)	None	2.5 mg/m ³ (resp)
磷酸铁锂	15365-14-7	None	None	None	None	None
聚偏氟乙烯	24937-79-9	None	None	None	None	None
乙炔黑（炭黑）	1333-86-4	3.5 mg/m ³	None	3 mg/m ³ inhalable	None	3.5 mg/m ³
铜	7440-50-8	0.1 mg/m ³ fume; 1 mg/m ³ dust/mist	None	0.2 mg/m ³ fume; 1 mg/m ³ dust/mist	None	0.1 mg/m ³ fume 1 mg/m ³ dust/mist
铝	7429-90-5	15 mg/m ³ total dust; 5 mg/m ³ resp. dust	None	1 mg/m ³ resp. dust	None	10 mg/m ³ (total) 5 mg/m ³ (resp)
羧甲基纤维素钠	9004-32-4	None	None	None	None	None
六氟磷酸锂	21324-40-3	None	None	None	None	None
碳酸二甲酯	616-38-6	None	None	None	None	None
碳酸乙烯酯	96-49-1	None	None	None	None	None
碳酸二乙酯	105-58-8	None	None	None	None	None



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碳酸甲酯乙酯	623-53-0	None	None	None	None	None
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9. 理化特性

外观（物理状态、颜色等）：固体。

气味：不适用

气味阈值：不适用

pH 值：不适用

熔点/熔化范围：不适用

沸点/沸点范围：不适用

闪点：不适用

蒸发速率：不适用

易燃性：不适用

可燃性或爆炸性上限/下限：完好无损的锂离子电池是稳定的，但是，暴露在高温下（如 150°C/302°F）或热事件可能会释放氢气。

自动点火温度：不适用

爆炸危险：完好的锂离子电池是稳定的。然而，暴露于热或热事件可能释放氢气，导致电池快速拆卸。

蒸气压：不适用

蒸汽密度：不适用

相对密度：不适用

在水中的溶解度/与水的混溶性：不溶性

10. 稳定性和反应性

反应性：锂离子电池的反应性没有具体的测试数据。

化学稳定性：完整的锂离子电池是稳定的。受损的锂离子电池可能释放可燃气体混合物。

危险反应的可能性：电解液和电极可能与水和湿气发生反应。

避免的情况：不要让导电材料接触端子，因为可能会发生短路，导致锂离子电池故障和火灾。不要刺穿，拆卸，或暴露在热或高温下。请远离火花或火焰。请勿超过制造商建议的充电时间或使用非产品专门设计的应用场景。

不相容材料：避免接触酸或氧化剂。由于潜在的剧烈反应和可能的闪火，请远离水。

危险的分解产物：受损的锂离子电池在燃烧时，可能会通过加热和燃烧分解释放出刺激性和有毒气体；也可能产生腐蚀性或有毒的烟雾。



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11. 毒理学信息

完整的锂离子电池不存在已知的毒理学风险。

受损锂离子电池化学混合物的暴露途径及潜在健康影响：

皮肤：引起刺激和/或热烧伤。

眼睛：刺激，发红，流泪和潜在的伤害，导致永久性视力障碍或化学烧伤。

吸入：灰尘、蒸气和烟雾可能会刺激呼吸系统。长时间吸入可能有害。

摄入：预计不是职业接触的途径。

急性毒性：受损的锂离子电池可能释放出碳氧化物、氢和/或氟化氢。没有对化学混合物进行测试。在第 3 节中提供了单独的组件信息作为指导。

12. 生态学信息

如果使用和处理得当，电池不会对环境造成危害。不要让内部成分释放到环境中，包括水、土壤和空气。

生态毒性：受损电池的电解液可能对水生环境有毒性。

水生毒性：无资料。

持久性和可降解性：没有可用的信息。

生物累积潜力：没有可用的信息。

在土壤中的流动性：没有可用的信息。

13. 废弃处置

电池在处理前应充分放电。按照适用的当地法律处理电池。锂离子电池可能受到联邦、州或地方法规的约束。

14. 运输信息

陆路运输：《国际公路危险货物运输》（ADR），《国际铁路危险货物运输规定》（RID）。

海上运输：《国际海上危险货物规则》（IMDG）。

航空运输：《国际民用航空组织-航空危险货物安全运输技术指令》（ICAO-TI），《国际航空运输协会-危险货物条例》（IATA-DGA）。

内河运输：《船载危险品安全监督和管理条例》，《欧洲国际内陆水道运输危险货物协定》（ADN）。

其他：《联合国关于危险货物运输建议书规章范本》（TDG）、《关于危险货物运输的建议书规章范本试验和标准手册》

运输方式	陆输 (ADR/RID)	海输 (IMDG)	航运 (ICAO/IATA)
联合国编号	3536	3536	N/A
运输名称	集装箱储能系统	集装箱储能系统	N/A

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运输危险等级	9	9	N/A
包装说明	SP389	SP389	N/A
标签			
注意事项	1. 运输的电池需要通过 UN38.3 实验测试。 2. 包装件应能承受 1.2m 任何方向的跌落试验，而不损坏包装件中的电池，改变包装件中电池的位置，使它们相互接触，并且没有电池从包装件中泄漏。 3. 电芯不得损坏或处理不当。如有损坏，必须进行隔离、检查和重新包装。 4. 符合国际法规对锂电池或锂电池组包装的特别规定。		

15. 法规信息

15.1 美国联邦法规

《职业安全与健康法》(OSHA): 雇主/企业必须确保在工作场所使用的锂电池、充电器和锂离子相关设备按照适当的测试标准(如 UL 2054)进行测试,并由具有 NRTL(国家认可的测试实验室)资格的测试机构进行认证。

有毒物质控制法(TSCA): 该产品未被列入。

清洁空气法(CAA): 本产品未被列入。

清洁水法(CCW): 本产品未被列入。

《加利福尼亚法规》第 8 章第 339 节:

石墨	7782-42-5
乙炔黑(炭黑)	1333-86-4
铜	7440-50-8
铝	7429-90-5
六氟磷酸锂	21324-40-3

第 65 号提案:

加利福尼亚第 65 条加利福尼亚州已知会导致出生缺陷或其他生殖伤害的成分:

乙炔黑(炭黑)	1333-86-4
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TSCA 组件: 锂离子电池不含 TSCA 第 5(e)条规定的任何成分。

SARA 302 组件: 锂离子电池不包含任何具有第 302 节 EHS TPQ 的组件。

SARA 313 组件: 锂离子电池不含 SARA TITLE III 第 313 条规定的报告水平的任何部件。

15.2 加拿大法规

工作场所危险品信息系统(WHMIS): 本产品未被列入。

危险产品法(HPA): 本产品未被列入。



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加拿大环境保护法（CEPA）：本产品未被列入。

15.3 德国法规

对水有害物质处理设施规定：本产品电解液的水害等级为 WGK2（对水有害）。

15.4 欧盟法规

不含 REACH 候选清单上的物质。

不含 REACH 附录 XVII/XIV 物质。

15.5 国际法规

《澳大利亚现有化学物质名录》（AICS）：本品未列入。

《中国现有化学物质名录》（IECSC）：本品未列入。

《日本现有化学物质名录》（ENCS）：本品未列入。

《韩国现有化学物质名录》（ISHL）：本品未列入。

《新西兰现有化学物质名录》（NZLOC）：本品未列入。

16. 其他信息

这里所包含的信息不提供任何形式的保证。 用户应将此数据仅视为对其收集的其他信息的补充，并必须对来自所有来源的信息的适用性和完整性做出独立决定，以确保正确使用和处置这些材料，以及员工和客户的安全和健康。