

SAFETY DATA SHEET

SDS 报告

Client Name : Shenzhen Growatt New Energy Co., Ltd.
委托单位 : 深圳古瑞瓦特新能源有限公司

Client Address : 4-13/F. Building A, Sino-German(Europe)
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District, Shenzhen, China
单位地址 : 深圳市宝安区西乡街道固兴社区航城大道中德欧产
业示范园 A 栋 A401, 4-13 楼

Product Name : Expansion Battery
产品名称 : 扩展电池包

Effective Date : 2025.01.02
生效日期

Shenzhen Anbotek Compliance Laboratory Limited
深圳安博检测股份有限公司



SAFETY DATA SHEET**安全数据清单****According to Hazard Communication standard (OSHA HCS) 29 CFR 1910.1200****1. Identification 鉴定**

Sample name: Expansion Battery
样品名称 扩展电池包

Sample model: NEXA 2000 Expansion Battery
样品型号

Rating: 51.2V/40Ah/2048Wh
规格

Weight 重量: 19.421kg

Manufacturer: Shenzhen Growatt New Energy Co., Ltd.
制造商 深圳古瑞瓦特新能源有限公司

Address: 4-13/F. Building A, Sino-German(Europe) Industrial Park, Hangcheng Ave, Bao'an District, Shenzhen, China
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Factory: Guangdong Growatt New Energy Co., Ltd.
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2. Hazard(s) identification 风险识别

(a) Preparation hazards and classification 产品的危害和分类

No harm at the normal use. When the battery is in extreme pressure deformation, high-temperature environment, overload, short-circuit condition, or disassemble the battery, an explosion of fire and chemical burn hazards may occur.

正常使用没有危害。当电池在挤压变形、高温环境、过载、短路状态,或拆卸电池,都有可能引发火灾和化学烧伤

(b) Primary Route(s) of Exposure 主要的接触途径

These chemicals are contained in a sealed stainless steel enclosure or a sealed aluminum foil pocket. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact.

电池应该包含在一个密封的不锈钢外壳里或一个密封的铝箔口袋。只有当电芯被机械地、过热地或电气地破坏的情况下,才发生暴露的风险。如果发生这种情况,暴露的电解质溶液可能会有吸入,摄入,与眼睛接触和皮肤接触等危险

(c) Potential Health Effects 潜在的健康影响:

ACUTE (short term)急性(短期): See section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns.

参考第 8 节的接触控制,在电池已破裂的情况下,电池内含有的电解质溶液是腐蚀性的,可导致灼伤。

Inhalation 吸入: A battery volatilizes no gas unless it was damaged. Damaged battery will volatilize little gas that may stimulate the respiratory tract or cause an anaphylaxis in serious condition.

电池不挥发气体,除非它被破坏。损坏的电池会挥发少量气体,会刺激呼吸道或引起过敏反应。

Ingestion 摄入: Swallowing battery will be damaged to the respiratory tract and cause chemical burns to the stomach; in serious conditions it will cause permanent damage.

吞食电池会损坏呼吸道,引起化学性灼伤,严重时会造成永久性损伤。

Skin 皮肤: In normal condition, contact between the battery and skin will not cause any harms. Contact with a damaged battery may cause skin allergies or chemical burns.

正常情况下,电池和皮肤接触不会造成任何危害。接触损坏的电池可能导致皮肤过敏或化学烧伤。

Eye 眼睛: In normal condition, contact between the battery and eyes will not cause any harms. However, the gas volatilize from a damaged battery may be harmful to eyes.

正常情况下,电池不会对眼睛造成任何危害。然而,从损坏的电池里面挥发出来的气体可能会对眼睛有害。



CHRONIC (long term)慢性(长期): See Section 11 for additional toxicological data.
参考第 11 节的毒理学数据

(d)Medical Conditions Aggravated by Exposure 接触导致医疗风险加重

No information available.无可用信息

(e)Reported as carcinogen 致癌物报告

No information available.无可用信息

GHS Label elements, including precautionary statements GHS 标签要素,包括预防性的语句:



GHS02



GHS05



GHS06

Signal word 信号词: Warning 警告

Hazard statement(s) 风险声明:

H242: Heating may cause a fire 加热可能引起火灾;

H311: Toxic in contact with skin 与皮肤接触会中毒;

H314: Causes severe skin burns and eye damage 引起严重的皮肤灼伤和眼睛损伤;

H302: Harmful if swallowed 吞食后对人体有害;

H332: Harmful if inhaled 吸入后对人体有害;

Precautionary statements 预防性语句:

Prevention 预防:

P264 Wash thoroughly after handling 操作后彻底清洗.

P270 Do not eat, drink or smoke when using this product 使用产品时不要进食, 饮水或吸烟.

P280 Wear protective gloves/protective clothing/eye protection/face protection 戴防护手套/防护服/保护眼睛/面部防护.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray 避免吸入灰尘/烟气/天然气/雾/蒸气/喷雾.

P271 Use only outdoors or in a well-ventilated area 仅在室外使用或在通风良好的区域使用.

Response 反应:

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

如果你感觉不舒服, 呼叫解毒中心或医生

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

如果接触皮肤, 要用大量的肥皂和水来清洗

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

如误吞: 漱口。不要呕吐

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

如误入眼睛: 用水冲洗几分钟。如果现在方便, 摘下隐形眼镜, 继续冲洗。



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

如果吸入:远离人群,呼吸新鲜空气,保持舒适。

Disposal 处理:

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

按照当地/国家法规处理内容物/容器

Hazards not otherwise classified (HNOC)未分类危害

Not Applicable不适用

3. Composition/Information on Ingredients 原料成分信息

(a) 综合信息 Mixtures information

Chemical Name 化学名称	Percent of Content 含量百分比 (%)	CAS No. CAS 编号
Lithium iron phosphate 磷酸铁锂 (LiFePO ₄)	28%	15365-14-7
Graphite 石墨(C)	17%	7782-42-5
Lithium hexafluorophosphate 六氟磷酸锂(LiPF ₆)	15%	21324-40-3
Aluminum 铝(Al)	8%	7429-90-5
Copper 铜(Cu)	12%	7440-50-8
poly(vinylidene fluoride) 聚偏氟乙烯树脂	5%	24937-79-9
Nickel 镍(Ni)	2%	7440-02-0
Iron 铁(Fe)	13%	7439-89-6

4. First-Aid Measures 急救措施

(a) Description of first aid measures 急救措施的描述

Inhalation 吸入: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice / attention if you feel unwell.

将患者转移到空气新鲜处,保持休息,呼吸舒畅的姿势。如感觉不适,立即就诊

Skin contact 皮肤接触: Remove contaminated clothes and rinse the skin with plenty of water. Get medical advice /attention if you feel unwell.

去除被污染的衣服,用大量的水冲洗皮肤。如感到不适,立即就诊

Eye contact 眼睛接触: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing. Get medical advice / attention if you feel unwell.

用水小心冲洗几分钟。如果方便,取出隐形眼镜,继续冲洗。如果感到不适,立即就诊。

Ingestion 摄入: Have victim drink 60 to 240 mL (2-8 oz.) of water. and DO NOT induce vomiting. Get medical aid.



受害者饮 60 至 240 毫升的水 (2-8 盎司), 并且不要呕吐。

如感到不适, 立即就诊

(b) Most important symptoms/effects, acute and delayed 最重要的症状和效果, 急性和延迟

Contact with internal components may cause allergic skin sensitization (rash) and irritate eyes, skin, nose, throat, respiratory system.

接触内部组件可能会导致皮肤过敏(皮疹)和刺激眼睛、皮肤、鼻子、喉咙、呼吸系统。

(c) Immediate medical attention and special treatment 立即就医和特殊处理

No information available. 无可用信息

5. Fire-Fighting Measures 消防措施

(a) Extinguishing media 灭火剂

Suitable extinguishing media 合适的灭火剂: Use foam, dry powder or dry sand, CO₂ as appropriate. 使用泡沫、干粉或干砂, 二氧化碳灭火剂。

Unsuitable extinguishing media 不合适的灭火剂: No information available. 无可用信息。

(b) Special hazards arising from the chemical 化学物品的特殊危害

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO, CO₂, Metal oxides, Irritating fumes.

在火灾情况下, 电池可能破裂并释放危险的分解产物暴露在火灾里。这可能会导致释放易燃或腐蚀性材料。危险燃烧产物: 一氧化碳, 二氧化碳, 金属氧化物, 刺激性烟雾。

(c) Special protective equipment and precautions for fire-fighters

特殊防护设备和消防队员的预防措施

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filtermask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish extinguishment.

消防人员必须穿防火防护设备和适当的呼吸器。工作人员必须配备完整的面具或独立的呼吸器。工作人员必须穿可以防御火灾和有毒气体的衣服。在上风方向灭火。移开容器, 开放空间。喷水在容器壁来保持冷却, 直到完成灭火。

6. Accidental Release Measures 泄露应急处理

(a) Personal precautions, protective equipment and emergency procedures

个人防护措施, 防护设备和应急程序

If the Lithium battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area, dispose the case after the batteries cool and vapors dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors.



如果锂聚合物电池材料泄漏出来,将这区域人员迅速转移,直到烟雾消散。提供最大限度的通风,清除有害气体。第一反应是离开此区域,接下来的处理是冷却电池和消散气体,提供最大限度的通风,避免皮肤和眼睛接触或吸入有害气体。

(b) Environmental Precautions 环境预防措施

Prevent material from contaminating soil and from entering sewers or waterways.
防止物质污染土壤和进入下水道或排水沟。

(c) Methods and materials for containment and cleaning up 控制和清理材料的方法

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.
如果电池壳被拆除,少量的电解质可能会泄漏。收集所有已释放的材料在一个塑料内衬容器。根据当地法律和规则处理掉。避免浸出物质进入土壤,渠道或水域

7. Handling and Storage 处置和储存

(a) Precautions for safe handling 安全操作注意事项

Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries Use recommended charging time and current.

始终遵循电池和设备的警告信息。只使用推荐的电池类型。让孩子远离电池。对于被儿童使用的设备,电池外壳应该有相应的防护。散装电池不应处于无包装状态。更换电池,总是用相同类型和品牌新电池进行替换。不允许吞咽电池。不要把电池扔进水里。不要把电池扔进火里。避免深度放电。不要使用短路电池,请使用推荐的充电时间和电流。

(b) Conditions for safe storage, including any incompatibilities

安全储存条件,包括任何不兼容问题

If the Lithium battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium battery periodically. Operating temperature: Charge: 0°C~45°C. Discharge: -10°C~50°C. And recommended at -10°C~45°C for 1 month storage, at -10°C~35°C for 3 months 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 range per cell block. Do not storage Lithium 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.

如果锂聚合物电池长期储存超过 3 个月,建议定期充电。充电温度:0°C~45°C。放电温度:-10°C~50°C,并建议在-10°C~45°C 储存 1 个月,在-10°C~35°C 储存 3 个月。储存后的容量恢复率(满充状态的 50%)在出货前应该接近 80%。长时间储存的电压控制在



3.7V~4.2V。不要把锂聚合物电池随意储存在盒子里或抽屉里，因为与其他金属物体接触容易造成短路。放在儿童接触不到的地方。

8. Exposure Controls/Personal Protection 接触控制/个人防护

(a) Engineering Controls 工程控制

Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.

使用局部通风系统或其他工程控制，以控制粉尘,雾,烟雾和蒸气来源。勿靠近热源和明火,储存在阴凉,干燥的地方。

(b) Personal Protective Equipment 个人防护设备

Respiratory Protection 呼吸保护: Not necessary under normal conditions. **Skin and body Protection:** Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery.

在正常使用情况下没有必要进行皮肤及身体防护:如果处理一个开放或泄漏的电池需戴氯丁或丁腈橡胶手套

Hand protection 手保护: Wear neoprene or natural rubber material gloves if handling an open or leaking battery.

如果处理一个开放或泄漏的电池需戴氯丁或丁腈橡胶手套。

Eye Protection 眼睛保护: Not necessary under normal conditions, wear safety glasses if handling an open or leaking battery.

在正常情况下没有必要保护。如果处理一个开放或泄漏的电池需佩戴安全眼镜。

(c) Other Protective Equipment 其他防护设备

Have a safety shower and eye wash fountain readily available in the immediate work area.

不要在工作区域饮食,喝酒或吸烟。保持良好的工作环境。

(d) Hygiene Measures 卫生措施

Do not eat, drink, or smoke in work area. Maintain good housekeeping.

不要在工作区域饮食,喝酒或吸烟。保持良好的工作环境。

9. Physical and Chemical Properties 物理和化学特性

(a) Appearance 外观	Solid 固体
(b) Odor 气味	Monotony 无味
(c) Odor threshold	Not available.
(d) pH	Not available.
(e) Melting point/freezing point	Not available.
(f) Initial boiling point and boiling range	Not available.
(g) Flash poin	Not available.
(h) Evaporation rate	Not available.
(i) Flammability	Not available.
(j) Upper/lower flammability or explosive limits	Not available.
(k) Vapor pressure	Not available.



(l)Vapor density	Not available.
(m)Relative density	Not available.
(n)Solubility(ies)	Not available.
(o)Partition coefficient: n-octanol/water	Not available.
(p)Auto-ignition temperature 自燃温度	130°C
(q)Decomposition temperature	Not available.
(r)Viscosity	Not available.

10. Stability and Reactivity 稳定性和反应性

(a) Reactivity 反应性

Stable under recommended storage and handling conditions.

在推荐的条件下储存和处理较为稳定。

(b) Chemical stability 化学的稳定性

Stable under normal conditions.

在正常情况下稳定

(c) Possibility of hazardous reactions 危险反应的可能性

When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies cont release of pressure without ignition.

当加热到150°C以上,会发生破裂的风险。由于特殊的安全结构,破裂意味着控制释放的压力,没有着火

(d) Conditions to avoid 避免条件

Do not subject Lithium battery to mechanical shock. Keep away from open flames, high temperature.

不要对锂聚合物电池进行机械冲击。远离明火,高温

(e) Incompatible materials 不兼容的材料

Strong oxidizer, strong acid.

强氧化剂、强酸。

(f) Hazardous decomposition products 分解产品的危险

Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

在火灾情况下,电极材料可以形成致癌的镍和氧化钴。

11. Toxicological Information 有害物质信息

(a) Information on the likely routes of exposure 接触途径的相关信息

Inhalation: Inhalation of a large number of vapors or fumes released due to heat may cause respiratory.

Ingestion 吸入: Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.吸入大量蒸汽或烟雾释放的热量可能导致呼吸不畅。

Skin contact 摄入: Contact with battery electrolyte may cause burns and skin irritation.摄入电池内部物质可能会引起口腔、咽喉和肠道烧伤。

Eye contact 眼睛接触: Contact with battery electrolyte may cause burns. Eye damage is possible.接触电池电解液可能引起烧伤,甚至损伤眼睛。



Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 2, and 4. Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up.

在正常情况下(在充电和放电时)不会释放成分。如果发生意外释放请参考第 2 节和第 4 节信息。吞咽电池是有害的。请致电当地中毒控制中心进行咨询和跟进。

(b) Information on toxicological characteristics 毒理性特征信息

Acute toxicity 急性毒性: No data available. 无可用信息

Skin corrosion/irritation 皮肤腐蚀/刺激: The liquid in the battery irritates. 电池液体的刺激

Serious eye damage/irritation 严重眼损伤/刺激: The liquid in the battery irritates. 电池液体可能导致一些人过敏

Respiratory sensitization 呼吸道过敏: The liquid in the battery may cause sensitization to some person. 电池液体可能导致一些人过敏

skin sensitization 呼吸道过敏: The liquid in the battery may cause sensitization to some person. 电池液体可能导致一些人过敏

Carcinogenicity 致癌性: Cobalt and Cobalt compounds are considered to be possible

human carcinogen(s). 钴和钴化合物被认为可能是致癌物

Germ Cell Mutagenicity 生殖细胞诱变: No data available. 无可用信息

Reproductive Toxicity 生殖毒性: No data available. 无可用信息

STOT-Single Exposure 暴露: No data available. 无可用信息

STOT-Repeated Exposure 暴露: No data available. 无可用信息

Aspiration Hazard 吸入性危害物质: No data available. 无可用信息

12. Ecological Information 生态信息

(a) Ecotoxicity 生态毒性

Water hazard class 1(Self-assessment): slightly hazardous for water.
水危害等级 1(自我评估):对水有轻微危害。

(b) Persistence and Degradability 持久性和降解性

No information available. 无可用信息

(c) Bioaccumulative potential 生物体内积聚的潜力

No information available. 无可用信息

(d) Mobility in soil 土壤迁移率

No information available. 无可用信息

(e) Other adverse effects 其他不利影响

No information available. 无可用信息

13. Disposal Considerations 处理注意事项

(a) Safe handling and methods of disposal 安全处理和处置的方法



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.

处理应依照适用的地区,国家和地方法律法规,地方性法规可能比区域或国家有更严格的要求。

产品处理建议:遵守当地、州和联邦法律法规。

不把废弃电池和蓄电池作为未分类的垃圾处理,参与他们的单独收集,以便于处理和回收利用。

14. Transport Information 运输信息

Label for conveyance 运输标签	Lithium Battery Label 锂电池标签
UN Number UN 编号	UN 3480
Transport hazard class(es) 运输风险类别	9
Packing group 包装等级	II
Marine pollutant 海洋污染物	No 无污染
UN Proper shipping name 联合国运输专用名称	Lithium ion Batteries (Including lithium ion polymer batteries) 锂离子电池(包括锂离子聚合物电池)
ICAO/IATA	Can be shipped by air in accordance with international Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA) DGR 66 th Packing Instructions Section IA of 965 appropriately. 可根据国际民用航空组织(ICAO), TI 或国际航空协会(IATA) DGR 66 版本包装说明 965 第 IA 节规定进行空运
IMDG CODE	International Maritime Dangerous Goods Code IMDG CODE (Amdt 42-24) 《国际海运危险货物规则》(IMDG CODE)相关规定 IMDG CODE (Amdt 42-24)



ADR European Agreement concerning the International Carriage of Dangerous Goods by Road

《国际危险货物道路运输欧洲协定》(ADR)相关规定

RID Regulations concerning the International Carriage of Dangerous Goods by Rail

《国际危险货物铁路运输欧洲协定》(RID)相关规定

The dangerous goods regulations require that each battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport.

危险品规例规定, 运输前, 每一个电池设计须通过联合国试验和标准手册38.3节所载的测试。

15. Regulatory Information 监管信息

《Dangerous Goods Regulations》

《危险物品规则》

《Recommendation on the Transport of Dangerous Goods Model Regulations》

《对危险货物运输的有关规定的建议》

《International Maritime Dangerous Goods》

《国际海运危险货物规则》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险品安全运输技术指令》

《Classification and code of dangerous Goods》

《危险货物分类和品名编号》

《Consumer Product Safety Act》(CPSA)

《消费产品安全法》

《Federal Environmental Pollution Control Act》(FEPCA)

《联邦环境污染控制法》

《Resource Conservation and Recovery Act》(RCRA)

《资源保护及恢复法案》

《European Agreement concerning the International Carriage of Dangerous》

《国际危险货物道路运输欧洲协定》

《Regulations concerning the International Carriage of Dangerous》

《国际危险货物铁路运输欧洲协定》

In according with all Federal, State and local laws.

根据所有联邦、州和地方法律。

16. Other Information 其他信息

The information above is believed to be accurate and represents the best information currently available to us. However, this document makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information,



consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

以上信息被认为是准确的, 代表了我們目前可獲得的最佳信息。然而, 本文沒有對商品性能保證或任何其他保證, 包括明示或暗示, 對這類信息的使用我們不承擔責任。用戶應做出自己的調查, 以確定是否適合其特定用途的信息。儘管在準備本文所載數據時已採取合理的預防措施, 但這些數據僅供您參考、考慮和調查。這個化學品安全技术說明書為本產品提供了安全操作指南和使用指南, 它並不能對所有可能發生的情況提供建議, 因此, 您特殊使用該產品應先進行評估, 以確定是否需要額外的預防措施。

* The SDS is prepared based on the information provided by client. The contents and formats of this SDS are revised as per client's request.

這份安全數據表是根據客戶提供的信息編輯, 其內容和格式按客戶要求來修訂。

-- End of report --

-- 報告結束 --

