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	Polymer Lithium-ion Battery (2)	Supersedes :

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Trade name/designation : Polymer Lithium-ion Battery (2)
Product code : 752439-650mah, 401225-80mah, 401722-100mah, 531728-175mah, 451730-190mah, 511643-300mah, 611343-300mah, 502530-300mah, 423040-450mah, 602248-560mah, 702050-670mah, 411740-240mah, 511740-900mah, 903242-1000mah, 105085-5200mah, 821960-1000mah

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/mixture : Cell battery

1.2.2. Uses advised against

No data available

1.3. Details of the supplier of the safety data sheet

Shenzhen Hugnen Technology (HGT) Co., LTD
N°2, Yinhu, baolihua Village, Guangming, Shenzhen City
GuangDong Province - China
T +0086-0755-23420683 - F +0086-0755-23420686
327876811@qq.com

1.4. Emergency telephone number

Emergency number : +0086-0755-23420683
Only available during office hours.

Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	Beaumont Hospital Beaumont Road 9 Dublin	+353 1 809 21 66 (public, 8am - 10pm, 7/7) +353 01 809 2566 (Professionals, 24/7)
United Kingdom	National Poisons Information Service (Newcastle Centre) Regional Drugs and Therapeutics Centre, Wolfson Unit	Claremont Place Newcastle-upon-Tyne NE1 4LP Newcastle	0844 892 0111 (UK only, Monday to Friday, 08.00 to 18.00 hours, healthcare professionals only)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin Sens. 1 H317

Full text of hazard classes and H-statements : see section 16

2.2. Label elements

Article. According to EC directives or the corresponding national regulations there is no labelling obligation for this product.

2.3. Other hazards

Other hazards : PBT/vPvB data : Not applicable . This article doesn't contain dangerous substances or preparations intended to be released under normal or reasonably foreseeable conditions of use.

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SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Cobalt lithium dioxide	(CAS No.) 12190-79-3 (EC No) 235-362-0	30 - 40	Skin Sens. 1, H317
Iron	(CAS No.) 7439-89-6 (EC No) 231-096-4 (EC Index) -	15 - 25	Not classified
Organic electrolyte	(CAS No.) - (EC No) - (EC Index) -	15 - 20	Not classified
Copper	(CAS No.) 7440-50-8 (EC No) 231-159-6 (EC Index) -	5 - 15	Not classified
Carbon (C)	(CAS No.) 7440-44-0 (EC No) 231-153-3	5 - 10	Not classified
Graphite	(CAS No.) 7782-42-5 (EC No) 231-955-3 (EC Index) -	5 - 10	Not classified
Aluminium	(CAS No.) 7429-90-5 (EC No) 231-072-3 (EC Index) 013-002-00-1	1 - 5	Not classified

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Additional advice	: First aider: Pay attention to self-protection. See also section 8 . Show this safety data sheet to the doctor in attendance. Treat symptomatically. Never give anything by mouth to an unconscious person or a person with cramps. In case of doubt or persistent symptoms, consult always a physician.
Inhalation	: Remove affected person from the danger area and lay down. Provide fresh air. In case of shortness of breath, give oxygen. Call a physician immediately.
Skin contact	: Remove contaminated, saturated clothing immediately. Rinse immediately with plenty of water for at least 15 minutes. Get medical advice/attention.
Eye contact	: Rinse immediately with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.
In case of ingestion	: Drink 1 or 2 glasses of water. Induce vomiting, but only if victim is fully conscious. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation	: None under normal processing. May cause nose, throat, and lung irritation. (Symptoms of Overexposure).
Skin contact	: None under normal processing. Causes burns.
Eye contact	: None under normal processing. Causes burns.
Ingestion	: None under normal processing. May cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Burns to the gastric/intestinal mucosa.

4.3. Indication of any immediate medical attention and special treatment needed

No data available

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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Dry extinguishing powder /. Carbon dioxide . Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Fire or intense heat may cause violent rupture of the packages. Hazardous decomposition products. Carbon oxides . Fumes (Li₂O). Do not allow run-off from fire-fighting to enter drains or water courses. Dispose of waste in accordance with environmental legislation.

5.3. Advice for firefighters

Firefighting instructions : Special protective equipment for firefighters. In case of fire: Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel : Evacuate personnel to a safe area. Provide adequate ventilation. Use personal protective equipment as required. Reference to other sections: 8 . Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid contact with skin and eyes. Do not breathe vapour.

6.1.2. For emergency responders

For emergency responders : Ensure procedures and training for emergency decontamination and disposal are in place. Reference to other sections: 8.

6.2. Environmental precautions

Do not allow to enter into surface water or drains.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Collect in closed and suitable containers for disposal. Clean with detergents. Avoid solvents. Ensure all waste water is collected and treated via a waste water treatment plant.

6.4. Reference to other sections

Disposal: see section 13. Concerning personal protective equipment to use, see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not pierce or burn, even after use. Do not allow to enter into surface water or drains. Avoid shock and friction.

Hygiene measures : Use only in area provided with appropriate exhaust ventilation. Wash hands and face before breaks and immediately after handling of the product. When using do not eat, drink or smoke. Keep good industrial hygiene.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Do not store near or with any of the incompatible materials listed in section 10. Keep container tightly closed in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid shock and friction. Protect from sunlight. Recommended storage temperature: 0°C~+35°C.

Packaging materials : Do not pierce or burn, even after use.

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7.3. Specific end use(s)

No data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Copper (7440-50-8)		
Austria	MAK (mg/m ³)	1 mg/m ³ (inhalable fraction) 0,1 mg/m ³ (respirable fraction, smoke)
Austria	MAK Short time value (mg/m ³)	4 mg/m ³ (inhalable fraction) 0,4 mg/m ³ (respirable fraction, smoke)
Belgium	Limit value (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Bulgaria	OEL TWA (mg/m ³)	0,1 mg/m ³ (metal vapor)
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust)
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	2 mg/m ³ (dust and fume)
Czech Republic	Expoziční limity (PEL) (mg/m ³)	1 mg/m ³ (dust) 0,1 mg/m ³ (fume)
Denmark	Grænseværdie (langvarig) (mg/m ³)	1,0 mg/m ³ (dust and powder) 0,1 mg/m ³ (fume)
Estonia	OEL TWA (mg/m ³)	1 mg/m ³ (total dust) 0,2 mg/m ³ (respirable dust)
Finland	HTP-arvo (8h) (mg/m ³)	1 mg/m ³ 0,1 mg/m ³ (respirable dust and fume)
France	VME (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust)
France	VLE (mg/m ³)	2 mg/m ³ (dust)
Greece	OEL TWA (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust)
Greece	OEL STEL (mg/m ³)	2 mg/m ³ (dust)
Hungary	AK-érték	1 mg/m ³ 0,1 mg/m ³ (fume)
Hungary	CK-érték	4 mg/m ³ 0,4 mg/m ³ (fume)
Ireland	OEL (8 hours ref) (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Ireland	OEL (15 min ref) (mg/m ³)	0,6 mg/m ³ (calculated-fume) 2 mg/m ³ (dust and mist)
Latvia	OEL TWA (mg/m ³)	0,5 mg/m ³
Lithuania	IPRV (mg/m ³)	1 mg/m ³ (inhalable fraction) 0,2 mg/m ³ (respirable fraction)
Netherlands	Grenswaarde TGG 8H (mg/m ³)	0,1 mg/m ³ (inhalable fraction)
Poland	NDS (mg/m ³)	0,2 mg/m ³
Portugal	OEL TWA (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Romania	OEL TWA (mg/m ³)	0,50 mg/m ³ (powder)
Romania	OEL STEL (mg/m ³)	0,20 mg/m ³ (fume) 1,50 mg/m ³ (dust)
Slovakia	NPHV (priemerná) (mg/m ³)	1 mg/m ³ (dust) 0,1 mg/m ³ (fume)

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Copper (7440-50-8)		
Slovakia	NPHV (Hraničná) (mg/m ³)	2 mg/m ³ (dust) 0,2 mg/m ³ (fume)
Slovenia	OEL TWA (mg/m ³)	1 mg/m ³ (inhalable fraction) 0,1 mg/m ³ (respirable fraction, fume)
Slovenia	OEL STEL (mg/m ³)	4 mg/m ³ (inhalable fraction) 0,4 mg/m ³ (respirable fraction, fume)
Spain	VLA-ED (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Sweden	nivågränsvärde (NVG) (mg/m ³)	1 mg/m ³ (total dust) 0,2 mg/m ³ (respirable dust)
United Kingdom	WEL TWA (mg/m ³)	1 mg/m ³ (dust and mists) 0,2 mg/m ³ (fume)
United Kingdom	WEL STEL (mg/m ³)	0,6 mg/m ³ (calculated-fume) 2 mg/m ³ (dust and mist)
Norway	Grenseverdier (AN) (mg/m ³)	0,1 mg/m ³ (fume) 1 mg/m ³ (dust)
Norway	Grenseverdier (Kortidsverdi) (mg/m ³)	0,1 mg/m ³ (fume) 1 mg/m ³ (dust)
Switzerland	VME (mg/m ³)	0,1 mg/m ³ (inhalable dust)
Switzerland	VLE (mg/m ³)	0,2 mg/m ³ (inhalable dust)
Australia	TWA (mg/m ³)	1 mg/m ³ (dust and mist) 0,2 mg/m ³ (fume)
Canada (Quebec)	VEMP (mg/m ³)	0,2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
USA - ACGIH	ACGIH TWA (mg/m ³)	0,2 mg/m ³ (fume)
USA - IDLH	US IDLH (mg/m ³)	100 mg/m ³ (dust, fume and mist)
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (dust and mist) 0,1 mg/m ³ (fume)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	0,1 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Aluminium (7429-90-5)		
Austria	MAK (mg/m ³)	10 mg/m ³ (inhalable fraction)
Austria	MAK Short time value (mg/m ³)	20 mg/m ³ (inhalable fraction)
Belgium	Limit value (mg/m ³)	1 mg/m ³
Bulgaria	OEL TWA (mg/m ³)	10,0 mg/m ³ (metal dust) 1,5 mg/m ³ (respirable fraction)
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	10 mg/m ³ (total dust) 4 mg/m ³ (respirable dust)
Czech Republic	Expoziční limity (PEL) (mg/m ³)	10,0 mg/m ³ (dust)
Denmark	Grænseværdie (langvarig) (mg/m ³)	5 mg/m ³ (dust, fume and powder, total) 2 mg/m ³ (dust and powder, respirable)
Estonia	OEL TWA (mg/m ³)	10 mg/m ³ (total dust) 4 mg/m ³ (respirable dust)
France	VME (mg/m ³)	10 mg/m ³ (metal) 5 mg/m ³ (dust)
Greece	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 5 mg/m ³ (respirable fraction)
Hungary	AK-érték	6 mg/m ³ (respirable dust)
Ireland	OEL (8 hours ref) (mg/m ³)	1 mg/m ³ (respirable dust)

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Aluminium (7429-90-5)		
Ireland	OEL (15 min ref) (mg/m ³)	3 mg/m ³ (calculated-respirable dust)
Latvia	OEL TWA (mg/m ³)	2 mg/m ³
Lithuania	IPRV (mg/m ³)	5 mg/m ³ (inhalable fraction) 2 mg/m ³ (respirable fraction) 1 mg/m ³
Poland	NDS (mg/m ³)	2,5 mg/m ³ (inhalable fraction) 1,2 mg/m ³ (respirable fraction)
Portugal	OEL TWA (mg/m ³)	10 mg/m ³ (metal dust)
Romania	OEL TWA (mg/m ³)	3 mg/m ³ (dust) 1 mg/m ³ (fume)
Romania	OEL STEL (mg/m ³)	10 mg/m ³ (powder) 3 mg/m ³ (fume)
Slovakia	NPHV (priemerná) (mg/m ³)	1,5 mg/m ³ (metal) 6 mg/m ³ (total aerosol)
Spain	VLA-ED (mg/m ³)	10 mg/m ³ (dust)
Sweden	nivågränsvärde (NVG) (mg/m ³)	5 mg/m ³ (total dust) 2 mg/m ³ (respirable dust)
United Kingdom	WEL TWA (mg/m ³)	10 mg/m ³ (inhalable dust) 4 mg/m ³ (respirable dust)
United Kingdom	WEL STEL (mg/m ³)	30 mg/m ³ (calculated-inhalable dust) 12 mg/m ³ (calculated-respirable dust)
Norway	Grenseverdier (AN) (mg/m ³)	5 mg/m ³ (pyrotechnical-powder)
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	5 mg/m ³ (pyrotechnical-powder)
Switzerland	VME (mg/m ³)	3 mg/m ³ (respirable dust)
Australia	TWA (mg/m ³)	10 mg/m ³ (dust) 5 mg/m ³ (welding fume)
Canada (Quebec)	VEMP (mg/m ³)	10 mg/m ³
USA - ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (respirable fraction)
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
Graphite (7782-42-5)		
Austria	MAK (mg/m ³)	5 mg/m ³ (alveolar dust with <1% Quartz, respirable fraction)
Austria	MAK Short time value (mg/m ³)	10 mg/m ³ (alveolar dust with <1% quartz, respirable fraction)
Belgium	Limit value (mg/m ³)	2 mg/m ³ (except fibers-alveolar fraction)
Bulgaria	OEL TWA (mg/m ³)	5,0 mg/m ³ (inhalable fraction)
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	4 mg/m ³ (respirable dust) 10 mg/m ³ (total dust)
Czech Republic	Expoziční limity (PEL) (mg/m ³)	2,0 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	2,5 mg/m ³ (natural-respirable)
Estonia	OEL TWA (mg/m ³)	5 mg/m ³ (dust)
Finland	HTP-arvo (8h) (mg/m ³)	2 mg/m ³
France	VME (mg/m ³)	2 mg/m ³ (alveolar fraction)
Greece	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction) 5 mg/m ³ (respirable fraction)

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Graphite (7782-42-5)		
Ireland	OEL (8 hours ref) (mg/m ³)	10 mg/m ³ (total inhalable dust) 4 mg/m ³ (respirable dust)
Ireland	OEL (15 min ref) (mg/m ³)	30 mg/m ³ (calculated-total inhalable dust) 12 mg/m ³ (calculated-respirable dust)
Latvia	OEL TWA (mg/m ³)	2 mg/m ³
Lithuania	IPRV (mg/m ³)	5 mg/m ³ (dust)
Poland	NDS (mg/m ³)	4,0 mg/m ³ (natural-inhalable fraction) 1,0 mg/m ³ (natural-respirable fraction) 6,0 mg/m ³ (synthetic-inhalable fraction)
Portugal	OEL TWA (mg/m ³)	2 mg/m ³ (all forms except Graphite fibers-respirable fraction)
Romania	OEL TWA (mg/m ³)	2 mg/m ³ (SiO ₂ <5%-respirable fraction, dust)
Slovakia	NPHV (priemerná) (mg/m ³)	2,0 mg/m ³ (respirable fraction, 5% or less fibrogenic component) 10 mg/m ³ (respirable fraction, greater than 5% fibrogenic component) 10 mg/m ³ (total aerosol)
Spain	VLA-ED (mg/m ³)	2 mg/m ³ (dust)
Sweden	nivågränsvärde (NVG) (mg/m ³)	5 mg/m ³ (total dust)
United Kingdom	WEL TWA (mg/m ³)	10 mg/m ³ (inhalable dust) 4 mg/m ³ (respirable dust)
United Kingdom	WEL STEL (mg/m ³)	30 mg/m ³ (calculated-inhalable dust) 12 mg/m ³ (calculated-respirable dust)
Norway	Grenseverdier (AN) (mg/m ³)	5 mg/m ³ (natural-total dust) 2 mg/m ³ (natural-respirable dust) 10 mg/m ³ (synthetic-total dust) 4 mg/m ³ (synthetic-respirable dust)
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	5 mg/m ³ (natural-total dust) 2 mg/m ³ (natural-respirable dust) 10 mg/m ³ (synthetic-total dust) 4 mg/m ³ (synthetic-respirable dust)
Switzerland	VME (mg/m ³)	2,5 mg/m ³ (natural-respirable dust) 5 mg/m ³ (natural-inhalable dust)
Australia	TWA (mg/m ³)	3 mg/m ³ (containing no asbestos and <1% crystalline silica, all forms except fibres, natural and synthetic-respirable dust)
Canada (Quebec)	VEMP (mg/m ³)	2 mg/m ³ (containing no Asbestos and <1% Crystalline silica, except Graphite fibres-respirable dust)
USA - ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (all forms except graphite fibers-respirable fraction)
USA - IDLH	US IDLH (mg/m ³)	1250 mg/m ³
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	2,5 mg/m ³ (natural-respirable dust)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (synthetic-total dust) 5 mg/m ³ (synthetic-respirable fraction)
Carbon (C) (7440-44-0)		
Austria	MAK (mg/m ³)	5 mg/m ³ (alveolar dust with <1% Quartz, respirable fraction)
Austria	MAK Short time value (mg/m ³)	10 mg/m ³ (alveolar dust with <1% quartz, respirable fraction)

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Carbon (C) (7440-44-0)		
Poland	NDS (mg/m ³)	4,0 mg/m ³ (natural-inhalable fraction) 1,0 mg/m ³ (natural-respirable fraction) 6,0 mg/m ³ (synthetic-inhalable fraction)

Additional information : Concentration measurement in air. Personal air monitoring

8.2. Exposure controls

Engineering control measures	: Provide adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Eye wash bottle with pure water. Use only at a place, which is equipped with a safety shower. Take precautionary measures against static discharges. Organisational measures to prevent /limit releases, dispersion and exposure : See also section 7.
Personal protection equipment	: Wear suitable protective clothing.
Hand protection	: Not required for normal conditions of use. Protective gloves (EN 374). The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves. (neoprene gloves. NBR (Nitrile rubber))
Eye protection	: Not required for normal conditions of use. Safety glasses (EN 166)
Body protection	: Wear suitable coveralls to prevent exposure to the skin
Respiratory protection	: Not required for normal conditions of use. In case of insufficient ventilation, wear suitable respiratory equipment. Full face mask (EN 136). Half-face mask (DIN EN 140). Filter type: ABEKP (EN141)
Thermal hazard protection	: Not required for normal conditions of use.
Environmental exposure controls	: Do not allow to enter into surface water or drains. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Appearance	: Sealed metallic canister.
Colour	: Silvery-white.
Odour	: odourless.
Odour threshold	: Not applicable
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Melting point/freezing point	: Not applicable
Freezing point	: No data available
Initial boiling point and boiling range	: Not applicable
Flash point	: Not applicable
Auto-ignition temperature	: Not self-igniting
Decomposition temperature	: Not applicable
Flammability (solid, gas)	: No data available
Vapour pressure	: Not applicable
Vapour density	: Not applicable
Relative density	: Not applicable
Solubility	: Insoluble in water.
Partition coefficient n-octanol/water	: Not applicable

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Kinematic viscosity : Not applicable
Dynamic viscosity : Not applicable
Explosive properties : Not applicable.
Oxidising properties : Not applicable.
Explosive limits : Not applicable

9.2. Other information

Additional information : Values : 3,7V, 650mAh, 2.4Wh

SECTION 10: Stability and reactivity

10.1. Reactivity

Reference to other sections: 10.5.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Avoid shock and friction. Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. See also section 7.

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Base metal. See also section 7.

10.6. Hazardous decomposition products

Burning produces noxious and toxic fumes. Carbon oxides (CO, CO₂)/. LiOx.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified (Based on available data, the classification criteria are not met)

Carbon (C) (7440-44-0)	
LD50/oral/rat	> 10000 mg/kg

Iron (7439-89-6)	
LD50/oral/rat	984 mg/kg bw

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: Not applicable
Serious eye damage/eye irritation : Not classified (Based on available data, the classification criteria are not met)
pH: Not applicable
Respiratory or skin sensitisation : May cause an allergic skin reaction.
Substances are only released upon destruction of the system
Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)
STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)
STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)
Other information : Symptoms related to the physical, chemical and toxicological characteristics.
Reference to other sections: 4.2.

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SECTION 12: Ecological information

12.1. Toxicity

Environmental properties : Ecological injuries are not known or expected under normal use.

Copper (7440-50-8)	
LC50 fish 1	0,0068 - 0,0156 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0,03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	< 0,3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
Iron (7439-89-6)	
LC50 fish 1	13,6 mg/l (Morone saxatilis)

12.2. Persistence and degradability

Polymer Lithium-ion Battery (2)	
Persistence and degradability	No data available.

12.3. Bioaccumulative potential

Polymer Lithium-ion Battery (2)	
Partition coefficient n-octanol/water	Not applicable
Bioaccumulative potential	No data available.

12.4. Mobility in soil

Polymer Lithium-ion Battery (2)	
Mobility in soil	No data available
Ecology - soil	Not applicable.

12.5. Results of PBT and vPvB assessment

Polymer Lithium-ion Battery (2)	
Results of PBT assessment	Not applicable

12.6. Other adverse effects

Additional information : No information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Handle with care. Reference to other sections: 7. Handling and storage . Dispose of as hazardous waste in compliance with local and national regulations. Refer to manufacturer/supplier for information on recovery/recycling. Collect and dispose of waste product at an authorised disposal facility.

Additional information : Do not pierce or burn, even after use. Dispose of contaminated materials in accordance with current regulations.

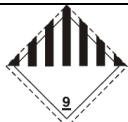
List of proposed waste codes/waste designations in accordance with EWC (2001/573/EC, 75/442/EEC, 91/689/EEC) : Classified as hazardous waste according to European Union regulations

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
3480	3480	3480	3480	3480
14.2. UN proper shipping name				
LITHIUM ION BATTERIES	LITHIUM ION BATTERIES	Lithium ion batteries	LITHIUM ION BATTERIES	LITHIUM ION BATTERIES
Transport document description				
UN 3480 LITHIUM ION	UN 3480 LITHIUM ION	UN 3480 Lithium ion	UN 3480 LITHIUM ION	UN 3480 LITHIUM ION

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ADR	IMDG	IATA	ADN	RID
BATTERIES, 9, (E)	BATTERIES, 9	batteries, 9	BATTERIES, 9	BATTERIES, 9
14.3. Transport hazard class(es)				
9	9	9	9	9
				
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
Not applicable				

14.6. Special precautions for user

Special precautions for user : No data available

- Overland transport

Classification code (ADR) : M4
 Special Provisions : 188, 230, 310, 348, 636, 376, 377
 Limited quantities (ADR) : 0
 Excepted quantities (ADR) : E0
 Packing instructions (ADR) : P903, P908, P909, LP903, LP904
 Transport category (ADR) : 2
 tunnel restriction code : E
 EAC code : 4W

- Transport by sea

Special provisions (IMDG) : 188, 230, 310, 348, 376, 377
 Limited quantities (IMDG) : 0
 Excepted quantities (IMDG) : E0
 Packing instructions (IMDG) : P903, P908, P909, LP903, LP904
 EmS-No. (Fire) : F-A
 EmS-No. (Spillage) : S-I
 Stowage category (IMDG) : A
 Stowage and handling (IMDG) : SW19
 Properties and observations (IMDG) : Electrical batteries containing lithium ion encased in a rigid metallic body. Lithium ion batteries may also be shipped in, or packed with, equipment. Electrical lithium batteries may cause fire due to an explosive rupture of the body caused by improper construction or reaction with contaminants.

- Air transport

PCA Excepted quantities (IATA) : E0
 PCA Limited quantities (IATA) : Forbidden
 PCA limited quantity max net quantity (IATA) : Forbidden
 PCA packing instructions (IATA) : See 965
 PCA max net quantity (IATA) : See 965
 CAO packing instructions (IATA) : See 965

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CAO max net quantity (IATA) : See 965
Special provisions (IATA) : A88, A99, A154, A164, A183
ERG code (IATA) : 9F

- Inland waterway transport

Classification code (ADN) : M4
Special provisions (ADN) : 188, 230, 310, 348, 376, 377, 636
Limited quantities (ADN) : 0
Excepted quantities (ADN) : E0
Equipment required (ADN) : PP
Number of blue cones/lights (ADN) : 0

- Rail transport

Classification code (RID) : M4
Special provisions (RID) : 188, 230, 310, 348, _376, 377, 636
Limited quantities (RID) : 0
Excepted quantities (RID) : E0
Packing instructions (RID) : P903, 908, 909, LP903, LP904
Transport category (RID) : 2
Colis express (express parcels) (RID) : CE2
Hazard identification number (RID) : 90

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Code: IBC : Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances

15.1.2. National regulations

Germany

VwVwS Annex reference : Water hazard class (WGK) 1, low hazard to waters (Classification according to VwVwS, Annex 4)
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands

SZW-lijst van kankerverwekkende stoffen : None of the components are listed
SZW-lijst van mutagene stoffen : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : None of the components are listed

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NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : None of the components are listed

Denmark

Recommendations Danish Regulation : Not applicable

15.2. Chemical safety assessment

Not required

SECTION 16: Other information

Abbreviations and acronyms:

	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	EC50 = Median Effective Concentration
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	TLV = Threshold limits
	TWA = time weighted average
	STEL = Short term exposure limit
	persistent, bioaccumulating and toxic (PBT).
	vPvB = very persistent and very bioaccumulating
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)

Sources of key data used to compile the datasheet : Name (SDS) Polymer Li-ion Battery. Report N° STR15129457S.
Manufacturer/Supplier Shenzhen Hugnen Technology (HGT) Co., LTD. ECHA (European Chemicals Agency).

Full text of H- and EUH-statements:

Skin Sens. 1	Skin sensitisation, hazard category 1
H317	May cause an allergic skin reaction.

The contents and format of this SDS are in accordance with EEC Commission Directive 2015/830/EC, 1272/2008/EC and EEC Commission Regulation 1907/2006/EC (REACH) Annex II.

DISCLAIMER OF LIABILITY The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

UN38.3 检测报告

UN38.3 Test Report

Client 委托方	Shenzhen Huguen Technolog(HGT) Co., LTD 深圳市辉能科技有限公司
Add. of Client 委托方地址	B2, Baoliuhua Industrial Park, Baihua Community, Guangming, Shenzhen 深圳市光明新区白花洞保利华工业园 2 栋
Samples Description 样品名称	Polymer Li-ion Battery 聚合物锂离子电池
Model 型号	852439
Testing Laboratory 测试机构	Shenzhen TCT Testing Technology Co., Ltd. 深圳市通测检测技术有限公司 1F, Building 1, Yibaolai Industrial Park, Qiaotou Village, Fuyong Town, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区福永桥头亿宝来工业城 1 栋 1 楼
Report No. 报告编号	TCT170116B002
Report Versions 版本号	V3.0
Issued Date 发行日期	Feb. 14, 2017
Test Conclusion 测试结论: Shown in the Conclusion of test report. 见检测报告结论页.	

Tested by 主检人: 秦娟 Sara Qin

Approved by 批准人: For [Signature]

Inspected by 审核人: [Signature] Sunny Zhang

Seal of TCT 报告单位 (盖章)

Date of Issue 签发日期: 2017.02.14



I、Sample Description 样品描述

Product Name 产品名称	Polymer Li-ion Battery 聚合物锂离子电池		Sample Model 样品型号	852439	
Manufacturer 制造商	Shenzhen Hugnen Technolog(HGT) Co., LTD 深圳市辉能科技有限公司				
Address 地址	B2, Baolihua Industrial Park, Baihua Community, Guangming, Shenzhen 深圳市光明新区白花洞保利华工业园 2 栋				
Trade Mark 商标	----	Shape 形状	Prismatic 棱形	Size 尺寸 (L×W×T)	(39.1×24.3×7.9)mm
Nominal Voltage 标称电压	3.7V	Rated Capacity 额定容量	750mAh 2.775Wh	Limited Charge Voltage 充电限制电压	4.2V
Standard Charge Current 标准充电电流	150mA	Maximum Continuous Charge Current 最大持续充电电流	750mA	End Charge Current 结束充电电流	8mA
Cut-off Voltage 放电截止电压	3.0V	Standard Discharge Current 标准放电电流	150mA	Maximum Discharge Current 最大放电电流	750mA
Cell Model 电芯型号	852439	Cell Nominal Voltage 电芯标称电压	3.7V	Cell Rated Capacity 电芯额定容量	750mAh
Cells Number 电芯数量	1PCS	Receiving Date 接收日期	2017-01-18	Completing Date 完成日期	2017-02-14

II、Standard 标准

Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6) Sixth revised edition

联合国《关于危险货物运输的建议书》第六版。

III、Test Item 测试项目

- | | |
|---|--|
| T.1. ☒ Altitude simulation 高度模拟 | T.5. ☒ External short circuit 外部短路 |
| T.2. ☒ Thermal test 温度试验 | T.6. ☐ Impact / ☒ Crush 重物冲击/挤压 |
| T.3. ☒ Vibration 振动 | T.7. ☒ Overcharge 过充电 |
| T.4. ☒ Shock 冲击 | T.8. ☒ Forced discharge 强制放电 |

IV、Test Method and Requirement 测试方法和要求

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells or batteries. Test T.7 may be conducted using undamaged batteries previously used in tests T.1 to T.5 for purposes of testing on cycled batteries.

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 和 T.8 用没有进行其他试验的电芯或电池。为了测试循环后的电池，试验 T.7 可用试验 T.1 至 T.5 后没有损坏的电池。

Batteries of 1#~14# are full charged after one cycle;

Batteries of 15#~18# are full charged after fifty cycles;

Component cells of 19#~23# are 50% charged after one cycle;

Component cells of 24#~33# are full discharged after one cycle;

Component cells of 34#~43# are full discharged after fifty cycles;

Test environment condition: ambient temperature: 15-25℃, ambient humidity: 40-70%

电池 1#~14#为一次循环满电状态;

电池 15#~18#为 50 次循环满电状态;

组成电芯 19#~23#为一次循环后 50%半电状态;

组成电芯 24#~33#为一次循环完全放电状态;

组成电芯 34#~43#为 50 次循环完全放电状态;

试验环境条件: 环境温度: 15-25℃, 环境湿度: 40-70%

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss (\%)} = (M1-M2)/M1 \times 100$$

质量损失的量化值，可用以下公式计算：

$$\text{质量损失(\%)}=(M1-M2)/M1\times 100$$

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it shall be considered as "no mass loss".

式中：M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
$M < 1\text{g}$	0.5%
$1\text{g} \leq M \leq 75\text{g}$	0.2%
$M > 75\text{g}$	0.1%

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table above.

渗漏系指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

In test T.1 to T.4, cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

T.1. Altitude simulation 高度模拟**Test method 测试方法**

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ($20 \pm 5^\circ\text{C}$).

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度($20\pm5^\circ\text{C}$)下存放至少 6 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火, 并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%, 有关电压要求不适用于测试完全放电状态的电芯和电池。

T.2. Thermal test 温度试验**Test method 测试方法**

Cells and batteries are to be stored for at least six hours at a test temperature equal to $72 \pm 2^\circ\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40 \pm 2^\circ\text{C}$. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ($20 \pm 5^\circ\text{C}$). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

电芯和电池放置在试验温度等于 $72\pm2^\circ\text{C}$ 的条件下存放至少 6 小时, 接着再在试验温度等于 $-40\pm2^\circ\text{C}$ 的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行, 共完成 10 次, 接着将所有试验电池在环境温度($20\pm5^\circ\text{C}$)下存放 24 小时。对于大型电芯和电池, 有极端暴露测试温度的时间至少应为 12 小时。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火, 并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%, 有关电压要求不适用于测试完全放电状态的电芯和电池。

T.3. Vibration 振动**Test method 测试方法**

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

电芯和电池紧固于振动台台面，但不得造成电池变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，1 次循环时间为 15 分钟。这一振动过程须对三个互相垂直的电池安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

做对数频率扫描，对总质量不足 12 千克的电芯和电池（电芯和小型电池），和对 12 千克及更大的电池（大型电池）有所不同。

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

对于大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25 Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

Requirement 要求

Cells and Batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test Cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。有关电压要求不适用于测试完全放电状态的电芯和电池。

T.4. Shock 冲击

Test method 测试方法

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.

Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.

Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。

每个电芯需经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。另外大电芯需要经受峰值加速度 50 gn 和脉冲持续时间 11 毫秒的半正弦波冲击。

每个电池接受半正弦波冲击峰值加速度取决于电池的质量，小型电池脉冲持续时间应为 6 毫秒，大型电池脉冲持续时间为 11 毫秒的半正弦波冲击，下面提供的公式来计算适当的最小峰值加速度。

每个电芯或电池需在三个互相垂直的电池安装方位的正方向经受三次冲击，接着在反方向经受三次冲击，总共经受 18 次冲击。

Requirement 要求

Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%，有关电压要求不适用于测试完全放电状态的电芯和电池。

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g _n or result of formula Acceleration(g _n) = $\sqrt{\frac{100000}{\text{mass}}}$ whichever is smaller	6 ms
Large batteries	50 g _n or result of formula Acceleration(g _n) = $\sqrt{\frac{30000}{\text{mass}}}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

T.5. External short circuit 外部短路

Test method 测试方法

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57 ± 4 °C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57 ± 4 °C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

测试的电芯或电池外壳温度达到恒温 57 ± 4 °C 后, 再进行外部短路。短路的时间取决于电芯或电池的尺寸和设计, 并需被评估和记录。如果这个评估无法进行, 那么小电芯和小电池短路时间至少 6 小时, 大电芯和大电池短路时间至少 12 小时。然后电芯或电池在 57 ± 4 °C 环境下经受一个阻值小于 0.1Ω 的外部电路短路。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57 ± 4 °C, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.

电芯或电池温度到 57 ± 4 °C 之后, 短路时间需持续 1 小时, 大型电池短路温度下降到最大温升的一半或低于 57 ± 4 °C。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

短路和降温阶段至少应在环境温度下进行。

Requirement 要求

Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

电芯和电池外壳温度不超过 170 °C, 并且在试验过程中及试验后 6 小时内无解体、无破裂, 无起火。

T.6. Impact / Crush 重物冲击/挤压

Test method – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)

测试方法 – 重物冲击 (适用于直径大于等于 18.0 毫米的圆柱形电池)

The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or Channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test

sample. Each sample is to be subjected to only a single impact.

试样电池或电池组放在平坦光滑表面上。一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米 ± 0.1 毫米，长度至少 6 厘米，或电池最长短的尺度，取二者之长者。将一块 9.1 千克 ± 0.1 千克的重锤从 61 ± 2.5 厘米高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。

垂直轨道或管道用于引导落锤沿与水平撑表面成 90 度落下。受撞击的试样，纵轴应于平坦表面平行并与横放在试样中心的直径 15.8 ± 0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。

Test method – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

测试方法 – 挤压 (适用于棱形，袋，硬币/纽扣电池和圆柱形电池直径小于 18.0 毫米)

A component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.

- (a) The applied force reaches 13 kN $\pm$ 0.78 kN;
- (b) The voltage of the cell drops by at least 100 mV; or
- (c) The cell is deformed by 50% or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis.

Each component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using component cells that have not previously been subjected to other tests.

将电芯放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 cm/s。挤压持续进行，直到出现以下三种情况之一：

- (a) 施加的力量达到 13 kN $\pm$ 0.78 kN;
- (b) 电芯的电压下降至少 100mV; 或
- (c) 电芯形变达原始厚度的 50%或更多。

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达原厚度的 50%，即可解除压力。

棱柱形或袋装电池须从最宽的面施压。纽扣/硬币形电池须从平坦表面施压。圆柱形电池须从与纵轴垂直的方向施压。

每个试样电芯只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的电芯进行。

Requirement 要求

Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire within six hours after the test.

电芯外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体，无起火。

T.7. Overcharge 过充电

Test method 测试方法

The charge current is twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

- (a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test is the lesser of two times the maximum charge voltage of the battery or 22V.
- (b) when the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

充电电流为制造商建议的最大持续充电电流的两倍。试验的最小电压如下：

(a) 制造商建议的充电电压不大于 18 伏时, 试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者。

(b) 当制造商建议的充电电压超过 18 伏, 试验的最小电压应 1.2 倍的最大充电电压。

试验应在环境温度下进行。进行试验的时间应为 24 小时。

Requirement 要求

Rechargeable Batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

可充电电池在试验过程中和试验后 7 天内无解体, 无起火。

T.8. Forced discharge 强制放电**Test method 测试方法**

Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

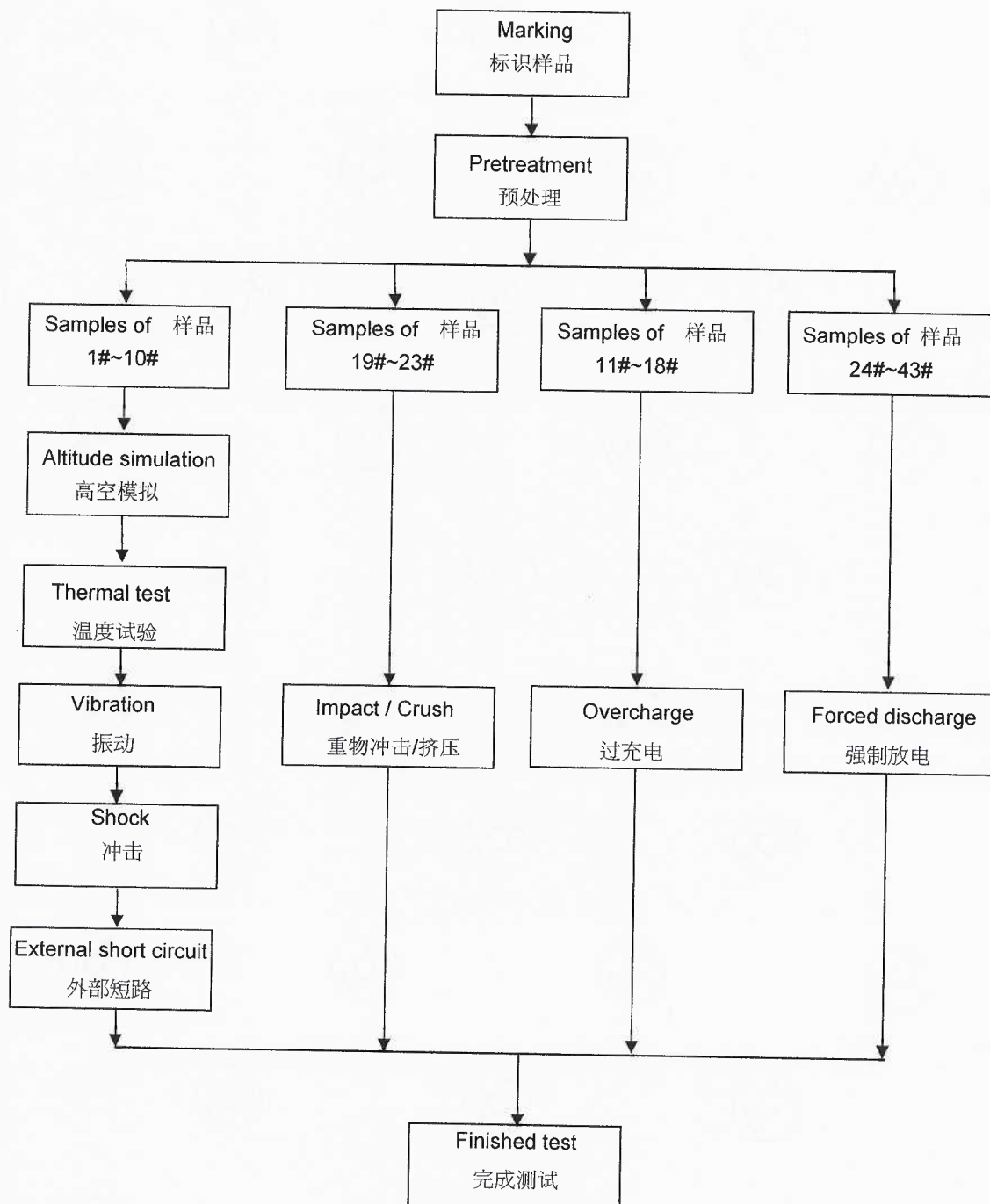
电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每块电芯的放电时间(单位为 h)等于电芯的额定容量除以试验初始放电电流(单位 A)。

Requirement 要求

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

不可充电或可充电的电芯在试验过程中和试验后 7 天内无解体, 无起火

V、Test Procedure 测试流程



VI、Main Test Apparatus 主要测试仪器

Serial No. 设备编号	Name of Equipment 设备名称	Model 型号	Calibration Date /Due Date 校准日期/到期日
TC-B01	Vacuum chamber (for battery test) 电池测试真空箱	GX-3020-Z	2016. 04. 26
			2017. 04. 25
TC-B04	Shock test instrument 冲击测试仪器	SY10-2	2016. 04. 26
			2017. 04. 25
TC-B05	Vibration test instrument 振动测试仪器	ES-3-150	2016. 04. 26
			2017. 04. 25
TC-B07	Rechargeable battery test system 充电电池测试系统	CTS-20V/10A-GGS	2016. 04. 26
			2017. 04. 25
TC-B10	Temperature circulation chamber 温度循环设备	BE-TH-150M8-4	2016. 04. 26
			2017. 04. 25
TC-B12	Crush test instrument 挤压测试仪器	BE-6045T	2016. 04. 26
			2017. 04. 25
TC-B13	Battery short circuit test instrument 电池短路测试仪器	BE-1000W	2016. 04. 26
			2017. 04. 25
TC-B14	Electronic Balance 电子天平	PTT-A+300	2016. 04. 26
			2017. 04. 25
TC-B15	Data acquisition unit 数据采集器	34970A	2016. 04. 26
			2017. 04. 25
TC-B18	DC regulated power supply 直流稳压电源	PSW 80-27	2016. 04. 26
			2017. 04. 25
TC-B21	Impact test instrument 撞击测试仪器	BE-5066	2016. 04. 26
			2017. 04. 25
TC-B24	Digital Multimeter 数字万用表	15B	2016. 04. 26
			2017. 04. 25
TC-B25	Battery anti-explosion chamber 电池防爆箱	GX-100	2016. 04. 26
			2017. 04. 25

VII、Test Data 测试数据

T.1. Altitude simulation 高度模拟

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	14.411	4.18	14.411	4.18	0.00	100.0	Pass 合格
	2#	14.582	4.19	14.582	4.19	0.00	100.0	Pass 合格
	3#	14.587	4.19	14.586	4.19	0.01	100.0	Pass 合格
	4#	14.564	4.18	14.564	4.17	0.00	99.8	Pass 合格
	5#	14.479	4.19	14.479	4.19	0.00	100.0	Pass 合格
	6#	14.542	4.18	14.542	4.18	0.00	100.0	Pass 合格
	7#	14.496	4.18	14.496	4.18	0.00	100.0	Pass 合格
	8#	14.513	4.19	14.513	4.18	0.00	99.8	Pass 合格
	9#	14.529	4.18	14.529	4.18	0.00	100.0	Pass 合格
	10#	14.508	4.19	14.507	4.19	0.01	100.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{ Pa}$, Ambient temperature 环境温度: 23.0°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。

T.2. Thermal test 温度试验

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	14.411	4.18	14.406	4.14	0.03	99.0	Pass 合格
	2#	14.582	4.19	14.576	4.15	0.04	99.0	Pass 合格
	3#	14.586	4.19	14.581	4.14	0.03	98.8	Pass 合格
	4#	14.564	4.17	14.558	4.14	0.04	99.3	Pass 合格
	5#	14.479	4.19	14.473	4.14	0.04	98.8	Pass 合格
	6#	14.542	4.18	14.537	4.15	0.03	99.3	Pass 合格
	7#	14.496	4.18	14.492	4.14	0.03	99.0	Pass 合格
	8#	14.513	4.18	14.507	4.14	0.04	99.0	Pass 合格
	9#	14.529	4.18	14.523	4.15	0.04	99.3	Pass 合格
	10#	14.507	4.19	14.502	4.14	0.03	98.8	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{ Pa}$, Ambient temperature 环境温度: 23.5°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。

T.3. Vibration 振动

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	14.406	4.14	14.406	4.14	0.00	100.0	Pass 合格
	2#	14.576	4.15	14.576	4.14	0.00	99.8	Pass 合格
	3#	14.581	4.14	14.579	4.14	0.01	100.0	Pass 合格
	4#	14.558	4.14	14.558	4.14	0.00	100.0	Pass 合格
	5#	14.473	4.14	14.473	4.14	0.00	100.0	Pass 合格
	6#	14.537	4.15	14.537	4.15	0.00	100.0	Pass 合格
	7#	14.492	4.14	14.492	4.14	0.00	100.0	Pass 合格
	8#	14.507	4.14	14.506	4.13	0.01	99.8	Pass 合格
	9#	14.523	4.15	14.523	4.15	0.00	100.0	Pass 合格
	10#	14.502	4.14	14.502	4.14	0.00	100.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: 1.013×10^5 Pa, Ambient temperature 环境温度: 23.9°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。

T.4. Shock 冲击

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 一次循环后满电状态	1#	14.406	4.14	14.406	4.14	0.00	100.0	Pass 合格
	2#	14.576	4.14	14.576	4.14	0.00	100.0	Pass 合格
	3#	14.579	4.14	14.578	4.14	0.01	100.0	Pass 合格
	4#	14.558	4.14	14.558	4.13	0.00	99.8	Pass 合格
	5#	14.473	4.14	14.473	4.14	0.00	100.0	Pass 合格
	6#	14.537	4.15	14.537	4.15	0.00	100.0	Pass 合格
	7#	14.492	4.14	14.491	4.14	0.01	100.0	Pass 合格
	8#	14.506	4.13	14.506	4.13	0.00	100.0	Pass 合格
	9#	14.523	4.15	14.523	4.14	0.00	99.8	Pass 合格
	10#	14.502	4.14	14.502	4.14	0.00	100.0	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: 1.013×10^5 Pa, Ambient temperature 环境温度: 23.7°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.
测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。

T.5. External short circuit 外部短路

The state of cells 样品状态	No. 编号	External Peak temperature(°C) 电池表面最高温度(°C)	Status 结果
Full charged after one cycle 一次循环后满电状态	1#	57.5	Pass 合格
	2#	57.6	Pass 合格
	3#	57.4	Pass 合格
	4#	57.7	Pass 合格
	5#	57.3	Pass 合格
	6#	57.4	Pass 合格
	7#	57.6	Pass 合格
	8#	57.5	Pass 合格
	9#	57.4	Pass 合格
	10#	57.6	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{ Pa}$, Ambient temperature 环境温度: 23.4°C
 There is no disassembly, no rupture and no fire within six hours after test.
 电池在测试后 6 小时内未解体、未破裂, 未起火。

T.6. Crush 挤压

The state of cells 样品状态	No. 编号	External Peak temperature(°C) 电池表面最高温度(°C)	Status 结果
50% charged after one cycle 一次循环后 50% 充电状态	19#	25.8	Pass 合格
	20#	25.4	Pass 合格
	21#	25.7	Pass 合格
	22#	25.9	Pass 合格
	23#	25.8	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{ Pa}$, Ambient temperature 环境温度: 23.9°C
 There is no disassembly, no rupture and no fire within six hours after test.
 电池在测试后 6 小时内未解体、未起火。

T.7. Overcharge 过充电

The state of cells 样品状态	No. 编号	Status 结果
Full charged after one cycle 一次循环后满电状态	11#	Pass 合格
	12#	Pass 合格
	13#	Pass 合格
	14#	Pass 合格

Full charged after fifty cycles 50 次循环后满电状态	15#	Pass 合格
	16#	Pass 合格
	17#	Pass 合格
	18#	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: 1.013×10^5 Pa, Ambient temperature 环境温度: 23.7°C
There is no disassembly and no fire during the test and within seven days after the test.
电池在测试中和测试测试后 7 天内未解体, 未着火。

T.8. Forced discharge 强制放电

The state of cells 样品状态	No. 编号	Status 结果
Full discharged after one cycle 一次循环完全放电状态	24#	Pass 合格
	25#	Pass 合格
	26#	Pass 合格
	27#	Pass 合格
	28#	Pass 合格
	29#	Pass 合格
	30#	Pass 合格
	31#	Pass 合格
	32#	Pass 合格
	33#	Pass 合格
Full discharged after fifty cycles 50 个循环完全放电状态	34#	Pass 合格
	35#	Pass 合格
	36#	Pass 合格
	37#	Pass 合格
	38#	Pass 合格
	39#	Pass 合格
	40#	Pass 合格
	41#	Pass 合格
	42#	Pass 合格
	43#	Pass 合格

Notes 注释: Atmospheric pressure 大气压强: 1.013×10^5 Pa, Ambient temperature 环境温度: 23.6°C
There is no disassembly and no fire during the test and within seven days after the test.
电芯在测试中和测试测试后 7 天内未解体, 未着火。

VIII、Conclusion 结论

No. 编号	Test item 测试项目	Sample number 样品数量	Test reference 测试参考	Conclusion 结论
1	Altitude simulation 高空模拟	1#~10#	UN Manual of Test and Criteria, part III, subsection 38.3.4.1 UN 试验和标准手册,第III部分,第 38.3.4.1 节	Pass 合格
2	Thermal test 温度试验		UN Manual of Test and Criteria, part III, subsection 38.3.4.2 UN 试验和标准手册,第III部分,第 38.3.4.2 节	Pass 合格
3	Vibration 振动		UN Manual of Test and Criteria, part III, subsection 38.3.4.3 UN 试验和标准手册,第III部分,第 38.3.4.3 节	Pass 合格
4	Shock 冲击		UN Manual of Test and Criteria, part III, subsection 38.3.4.4 UN 试验和标准手册,第III部分,第 38.3.4.4 节	Pass 合格
5	External short circuit 外部短路		UN Manual of Test and Criteria, part III, subsection 38.3.4.5 UN 试验和标准手册,第III部分,第 38.3.4.5 节	Pass 合格
6	Impact/Crush 重物冲击/挤压	19#~23#	UN Manual of Test and Criteria, part III, subsection 38.3.4.6 UN 试验和标准手册,第III部分,第 38.3.4.6 节	Pass 合格
7	Overcharge 过度充电	11#~18#	UN Manual of Test and Criteria, part III, subsection 38.3.4.7 UN 试验和标准手册,第III部分,第 38.3.4.7 节	Pass 合格
8	Forced discharge 强制放电	24#~43#	UN Manual of Test and Criteria, part III, subsection 38.3.4.8 UN 试验和标准手册,第III部分,第 38.3.4.8 节	Pass 合格

The submitted samples were complied with the stated requirements of UN manual of test and criteria, part III, subsection 38.3

经检测,提交的测试样品均符合 UN38.3 的要求,测试结论为合格。

IX、Photo of The Sample 样品图片

Model 型号: 852439

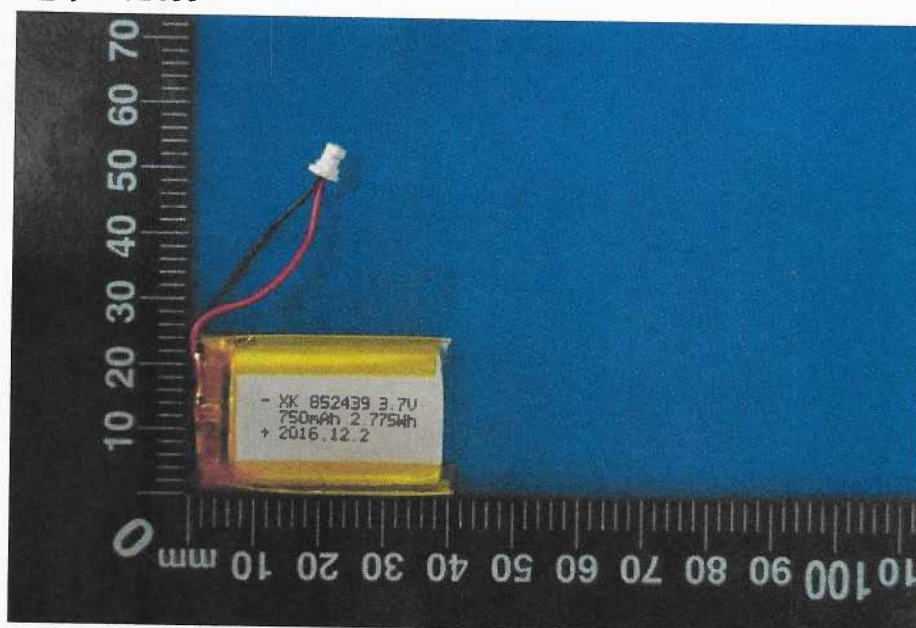


Photo 1 Front 正面

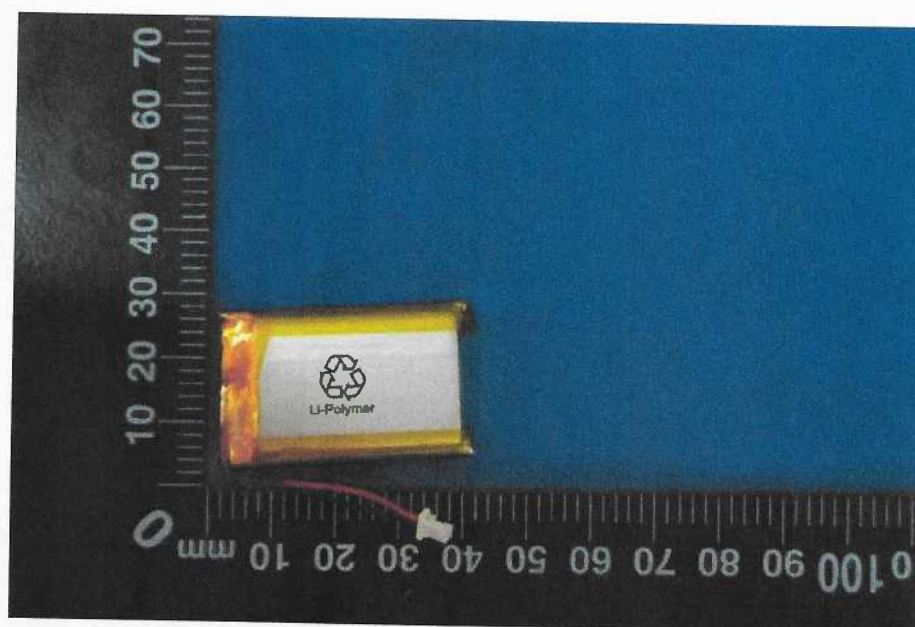


Photo 2 Rear 反面

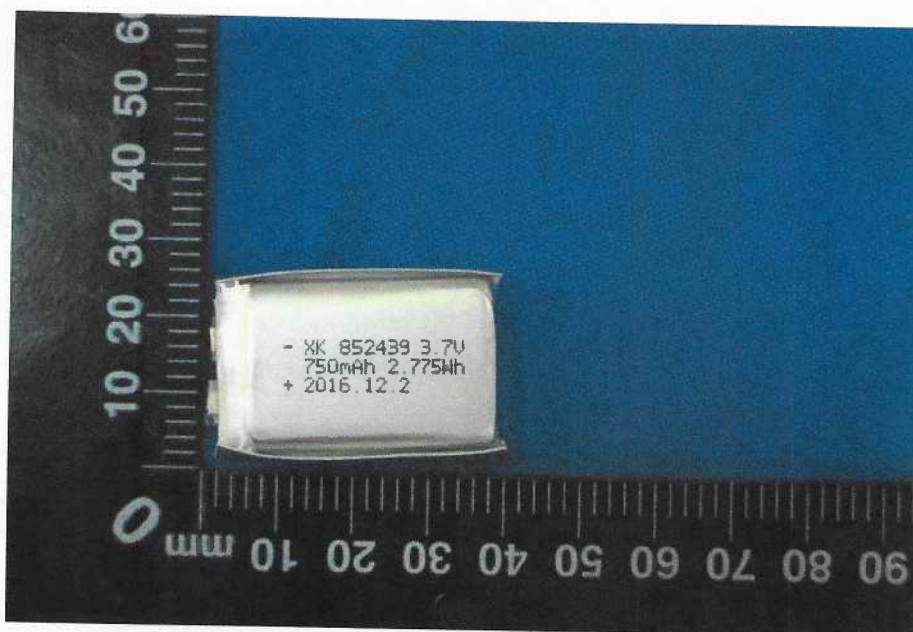


Photo 3 Internal Cell 内部电芯

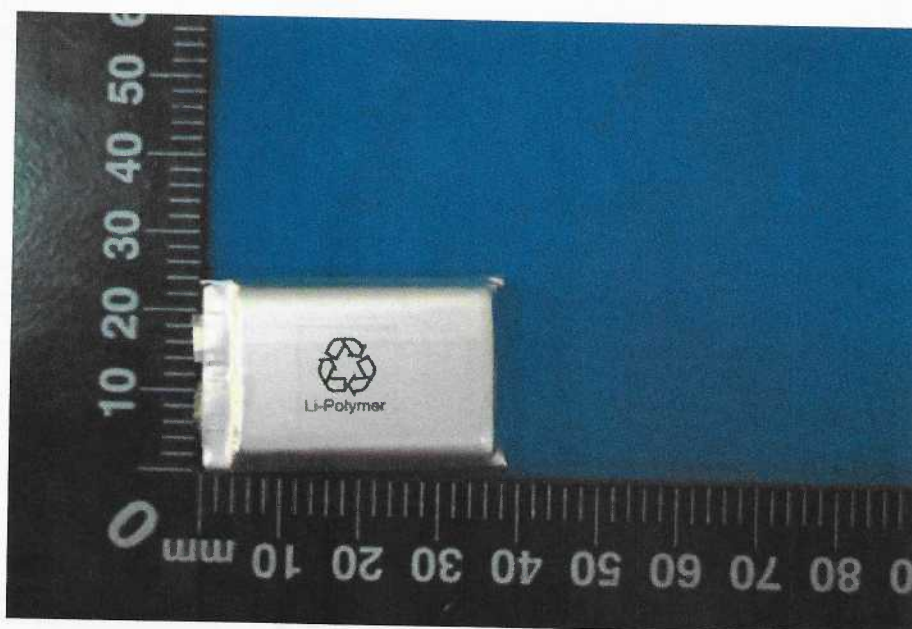


Photo 4 Internal Cell 内部电芯

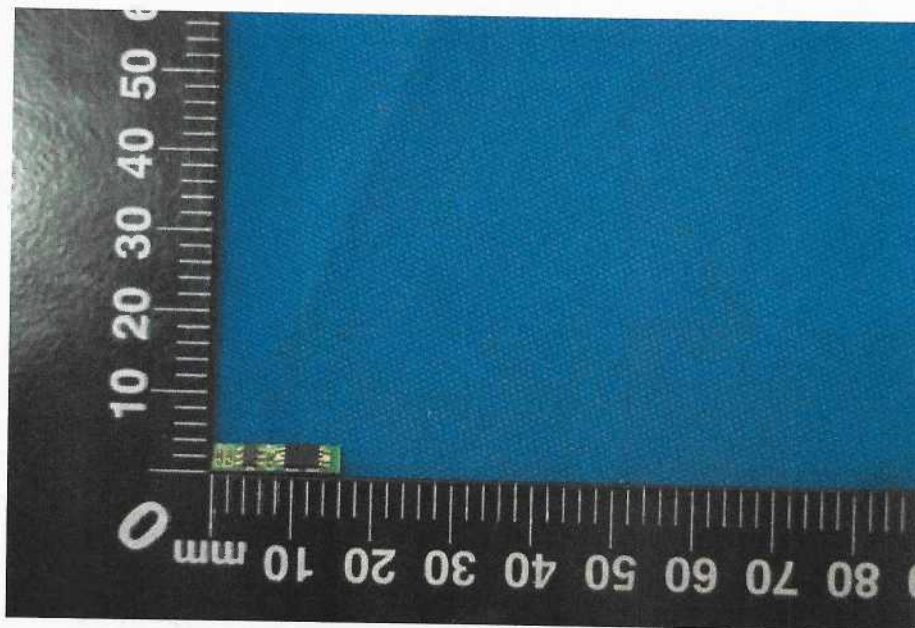


Photo 5 Protection board 保护板

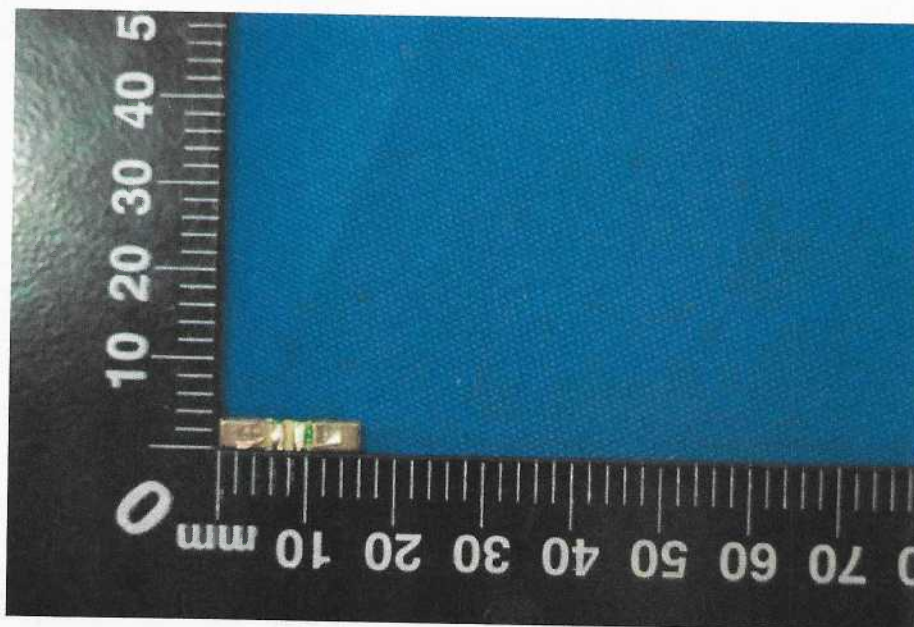


Photo 6 Protection board 保护板

*****End of Report 报告结束*****

注意事项

Important Notice

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本报告书无 TCT 盖章无效。
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6. The test report is valid for the tested samples only.
本报告仅对本次测试样品有效。
7. The Chinese contents in this report are only for reference.
本报告中的中文内容仅供参考。