TRACER®
HIGH PERFORMANCE BATTERIES
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SAFETY DATA SHEET
LITHIUM ION POLYMER (LiPo) BATTERIES

1. PRODUCT IDENTIFICATION

Product name: Lithium Ion polymer rechargeable batteries

2. COMPOSITION / INFORMATION ON INGREDIENTS

IMPORTANT NOTE: The battery cell should not be opened or exposed to heat as exposure to the following ingredients contained within could be harmful under some circumstances.

INGREDIENTS	CONTENT (% of Weight)	CAS No.	EINECS
Lithium Cobalt Oxide (LiCoO2)	50	12190-79-3	235-362-0
Carbon (Graphite)	10	7782-42-5	231-955-3
PP	5	9003-07-0	NA
PVDF	2	24937-79-9	NA
PE	5	9002-88-4	NA
CMC	0.5	9004-32-4	NA
LiPF6	5	21324-40-3	244-334-7
EC	5	96-49-1	202-510-0
DMC	5	616-38-6	210-478-4
Ni	2.5	7440-02-0	231-111-4
Cu	5	7440-50-8	231-159-6
Al	5	7429-90-5	231-072-3

Weight % listed is based on approximate percent of the average weight of the battery

3. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed Aluminum laminated case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached and hazardous materials may be released.

Moreover, if heated strongly by the surrounding fire, hydrogen fluorite gas may be emitted.

Most important hazards and effects

Human health effects:

• Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.
• Skin contact: The steam of the electrolyte stimulates skin. The electrolyte skin contact causes a sore and stimulation on the skin.
• Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, strong inflammation of the eyes is caused.

Environmental effects: Do not throw out it into the environment.

Specific hazards:

If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

4. FIRST-AID MEASURES

Spilled internal cell materials

Inhalation: Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

Skin contact: Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

Eye contact: Do not rub in eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

Ingestion: Make the victim vomit. Seek medical attention.

5. FIRE-FIGHTING MEASURE

Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

Specific hazards: Corrosive gas may be emitted during fire.

Specific methods of fire-fighting: When the battery burns with other combustibles, use the fire- extinguishing method which corresponds to the combustible items. Extinguish a fire from an up- wind position as much as possible to avoid inhalation.

Special protective equipment for firefighters:

Respiratory protection: Respiratory equipment or, if not available, dust mask.

Hand protection: Protective gloves.

Eye protection: Goggles or protective glasses designed to protect against liquid splashes

Skin and body protection: Protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell material, including leaked material from a battery cell, is to be dealt with carefully.

Precautions for human body:

Remove spilled materials with protective equipment (protective glasses and protective gloves).

Do not inhale the gas as much as possible. Moreover, avoid touching as much as possible.

Environmental precautions:

Do not throw out into the environment.

Method of cleaning up:

The spilled solids are put into a container.

The leaked materials should be wiped off with dry cloth.

Prevention of secondary hazards:

Avoid re-scattering.

Do not bring the collected materials close to fire.

7. HANDLING AND STORAGE

Handling

Prevention of user exposure: Not necessary under normal use.

Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling: Do not damage or remove the external casing.

Specific safe handling advice:

- Never throw out cells in a fire or expose to high temperatures.
- Do not soak cells in water or seawater.
- Do not expose to strong oxdizers.
- Do not give a strong mechanical shock or fling.
- Never disassemble, modify or deform.
- Do not connect the positive terminal to the negative terminal with electrically conductive material.
- In the case of charging, use only dedicated charger and charge according to the conditions specified by the user manual.

7. HANDLING AND STORAGE (cont.)

Storage

Storage conditions: Avoid direct sunlight, high temperature, and high humidity. Store in cool, dry place (temperature: 20 - 35°C, humidity: 45 - 85%).

Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids.
Packing material: Insulating and tear-proof materials are recommended.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Use adequate ventilation and recommended personal equipment.
Respiratory protection: Respirator with air cylinder, dust mask. Hand protection: Protective gloves.

Eye protection: Goggles or protective glasses designed to protect against liquid splashes.

Skin and body protection: Working clothes with long sleeves and long trousers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state: Solid
Form: Prismatic
Color: Metallic color (without casing), Green/black (with casing)
Smell: Odorless
pH: N/A
Specific temperatures/temperature ranges at which changes in physical state occur: N/A
Flash point: N/A
Explosion properties: N/A
Density: N/A
Solubility with indication of the solvent(s): Insoluble in water

10. STABILITY AND REACTIVITY

Stability: Stable under normal use. Hazardous reactions occurring under specific conditions

Conditions to avoid: When a battery cell is exposed to an external short-circuit, is crushed, deformed, or exposed to high temperature above 100°C, it will generate heat and possibly ignite. Do not place it in direct sunlight or high humidity.

Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.

Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

11. TOXICOLOGICAL INFORMATION

CAS NO.	RETCS
12190-79-3	None list
7782-42-5	MD9659600
9003-07-0	UD1842000
24937-79-9	None listed
9002-88-4	TQ3325000;KX3270000
9004-32-4	FJ5950000
21342-40-3	None listed
96-49-1	FF9550000
616-38-6	FG0450000
7440-02-0	QR5950000;QR6126100;QR6555000;QR7120000
7440-50-8	GL5325000;GL7440000;GL7590000
7429-90-5	BD0330000;BD1020000

Ingredients: hydroxide methyl cellulose sodium
• LC50: > 5800 mg/m3/4h
• LD50: > 27 g/kg
Ingredients: LiPF6
• LD50: > 1702 mg/kg

11. TOXICOLOGICAL INFORMATION (cont.)

Ingredients: Ethylene carbonate
• LD50: > 10000 mg/kg
• LD50: > 3000 mg/kg
Ingredients: Dimethyl carbonate
• LD50: > 6000 mg/kg
• LD50: > 13000 mg/kg

Irritation: NA

Carcinogenicity:
Ingredients: Nickel
• LARC-2B: potential carcinogen
• ACGIH A5: non-human carcinogen

Other substances: Not be listed under ACGIH, IARC, NTP

12. ECOLOGICAL INFORMATION

Persistence/degradability: Do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

Disposal means: According to national and local laws and regulations.
Recommended methods for safe and environmentally preferred disposal:
• Product (waste from residues): Do not throw out a used battery cell. Recycle it through the recycling company, or local council refuse centre.
• Contaminated packaging: Neither a container nor packing is contaminated during normal use.
• When internal material is leaked from a battery, dispose of as industrial waste subject to special controls.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation.

Prevent falling, dropping and breakage.

Prevent collapse of cargo piles and water damage.

The container must be handled carefully.

Please refer to Section 7-HANDLING AND STORAGE.

The transport of Lithium ion batteries is subject to international regulation which can differ if the batteries are transported by air, sea or road. There are a range of fines for companies (including OEMs) who do not comply with these regulations.

All Tracer Power batteries, covered in this document, have met the requirements of the UN Manual of Tests and Criteria, Fifth Revised Edition (ST/SG/AC.10/11/Rev.5 section 38.3 entitled “Lithium Metal and Lithium ion Batteries”) and can therefore be transported.

The UN numbers, and proper shipping names, of Lithium Ion batteries, are as follows:

UN3480 – Lithium ion batteries

UN3481 – Lithium ion batteries contained in equipment or packed with equipment

Lithium ion batteries which have been transportation tested but have a possible stored energy of >100Wh must be transported as Class 9 dangerous goods which impose strict packaging, labeling and documentation requirements on those shipping the product. Special training and certification is required for those wishing to ship class 9 dangerous goods.

Lithium ion batteries which have been transportation tested and have a possible stored energy of <100Wh are accepted from dangerous goods regulations but still have special packaging, labeling and document requirements.

There are restrictions on the number and size of Lithium ion batteries which can be taken on board aircraft (as carry on or checked in luggage).

15. REGULATORY INFORMATION

Regulations specifically applicable to the product:

IATA-DGR (air transportation)

IMO-IMDG Code (sea transportation)

US Department of Transportation 49 Code of Federal Regulations [USA]

Wastes Disposal and Public Cleaning Law [Japan]

Law for Promotion of Effective Utilization of resources [Japan]

16. OTHER INFORMATION

The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.

This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.