MATERIAL SAFETY DATA SHEET

COMPANY NAME:	ROAMER BATTERIES LTD.
ADDRESS:	CASTLETON MILL CASTLETON CLOSE LEEDS LS12 2DS UNITED KINGDOM
MODEL:	100SMART3; 160SMART3; 230SEATBASE3; 230SMART3; 24-230SMART3; 320SMART3; 460SMART3; 100XTREME; 200XTREME; 24-100XTREME; 48-105HOME;
DATE:	22ND AUGUST 2023
TELEPHONE:	0113 887 8335
EMAIL:	HELLO@ROAMER.COM

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Battery Designation:	Lithium Iron Phosphate Battery (LiFePO4)
Proper Shipping Name:	Lithium Ion Battery
Rating:	Model Dependent (12.8 V, 25.6 V, 51.2 V)
Rated Capacity:	Model Dependent (1344Wh - 5888Wh)
Weight:	Model Dependent (11 kg - 45 kg)
Manufacturer:	Roamer Batteries Ltd.
Address:	Castleton Mill, Castleton Close, Leeds, LS12 2DS, UK
Telephone:	0113 887 8335
Email:	hello@roamer.com

2. HAZARDS SUMMARY

ROUTES OF ENTRY – HEALTH HARM

2. HAZARDS SUMMARY

Eyes and Skin	When leaking, the electrolyte solution contained in the battery irritates to ocular tissues and the skin.
Inhalation	Respiratory (and eye) irritation may occur if fumes are released due heat or an abundance of leaking batteries.
Ingestion	The ingestion of the battery can be harmful. Content of open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.
Inhalation	Burns and irritation of the respiratory system, coughing, wheezing, and shortness of breath.
Eyes	Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues.
Skin	The electrolyte is corrosive and causes skin irritation and burns.
Ingestion	The electrolyte solution causes tissue damage to throat and gastrointestinal tract.

3. FIRST AID MEASURES

CONTACT WITH EYES:	Flush eyes repeatedly with plenty of water or eye flush kit. Seek medical attention if any irritation persists.
CONTACT WITH SKIN:	Remove any contaminated clothing, jewelry or shoes. Immediately wash skin thoroughly with water and soap, repeating as necessary. Wash clothes, jewelry and/or shoes before wearing again. Seek medical attention if any irritation persists.
INHALATION:	Remove victim to a non-exposed area, preferably outside. Administer artificial respiration if breathing is difficult and call emergency services immediately.
SWALLOWING:	Do not induce vomiting. Seek medical attention immediately.

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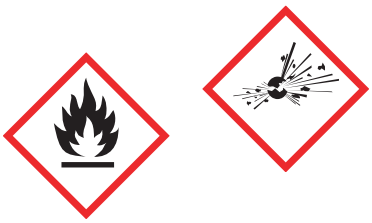
4. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	PERCENT OF CONTENT	CAS No.
Lithium Iron Phosphate (LiFePO4)	35%	15365-14-7
Graphite (G)	11%	7782-42-5
Lithium Hexafluorophosphate (LiPF6)	15%	21324-40-3
Aluminium (Al)	5%	7429-90-5
Copper (Cu)	10%	7440-50-8
High Molecular Polymer	3%	--
Nickel (Ni)	1%	7440-02-0
Iron (Fe)	20%	7439-89-6

5. FIRE FIGHTING MEASURES



UNUSUAL FIRE AND EXPLOSION HAZARDS

BATTERY MAY EXPLODE OR LEAK POTENTIALLY HAZARDOUS VAPOURS SUBJECT TO:

- Exposed to excessive heat (above the maximum rated temperature as specified by the manufacturer).
- Fire.
- Overcharging.
- Short circuit.
- Puncturing.
- Crushing.

6. FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Fire, excessive heat, or overvoltage conditions may produce hazardous decomposition products. Battery may burst when exposed to a fire situation. Damaged batteries can result in rapid heating and the release of flammable vapours.

EXTINGUISHING MEDIA

Dry chemical type extinguishers are the most effective means to extinguish a battery fire. A CO2 extinguisher will also work effectively.

Use an extinguishing agent that is suitable for the local conditions and the surrounding environment.

FIRE FIGHTING PROCEDURES

Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary.

During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

7. HANDLING AND STORAGE

HANDLING

- Batteries are designed to be recharged.
- Improperly charging the battery may cause fire.
- When charging the batteries, always follow the manufacturers instructions and used dedicated chargers as specified by the manufacturer.
- Never disassemble or modify a battery.
- Do not immerse in water, do not allow battery to get wet.
- Should a battery be crushed, thus releasing it's contents, rubber gloves must be used to handle all battery components. Avoid inhalation of any vapours that may be emitted.
- Short circuit causes heating.
- Short circuit causes reduces the life of the battery and can lead to ignition of surrounding materials.
- Physical contact with short-circuited batteries can cause burns to skin.
- Avoid reversing the polarity, which can cause damage to the battery or cause fire.
- Consumption of food and drink must be avoided in work areas.
- After handling batteries, wash hands with soap and water before eating or drinking.
- Ground containers when transferring liquid to prevent static accumulation and discharge.

7. HANDLING AND STORAGE

STORAGE

- Batteries should be separated from other materials and stored in a non-combustible, well ventilated, sprinkler protected structure with sufficient clearance between walls and battery stacks.
- Do not place batteries near heating equipment.
- Do not expose batteries to direct sunlight for extended periods.
- Do not store batteries above 35C or below -20C. Store batteries in a cool, dry and ventilated area that is subject to little temperature change.
- Elevated temperature can reduce battery cycle life.
- Batteries exposed to temperatures in excess of 60C will result in the battery venting flammable liquid and gases.
- Keep batteries in original packaging until ready for use or installation.
- Do not vibrate, impact, drop or abuse the battery in any way.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Keep away from heat and open flame.
Ventilation	Not necessary under conditions of normal use. In case of abuse, use adequate mechanical ventilation or remove battery to a safe, well-ventilated area for a battery that vents gas or fumes.
Respiratory Precautions	Not necessary under conditions of normal use. If the battery is burning, leave the area immediately. During fire-fighting, firefighters must use self-contained breathing apparatus and full faced respiratory equipment.
Eye Protection	Not necessary under conditions of normal use. Use safety glasses with side shields if handling leaking or ruptured batteries.
Body Protection	Not necessary under conditions of normal use. Use rubber apron and chemical-resistant, rubber, protective gloves to reduce skin contact as much as possible when handling a leaking or ruptured battery.
Others	Use good chemical hygiene practice. Wash hands thoroughly with soap and hot water after cleaning up a battery spill caused by a leaking battery. No eating, drinking or smoking in a battery storage area.

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9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

- Color: Black
- Physical State: Prismatic
- Odour: Monotony
- Odour Threshold: Not available
- pH: Not available
- Melting point/freezing point: Not available
- Initial boiling point and boiling range: Not available
- Flash Point: Not available
- Evaporation Rate: Not available
- Flammability (solid, gas): Not available
- Explosion Limits (vol% in air): Not available
- Vapour Pressure, kPa at 20°C: Not available
- Vapor Density: Not available
- Density/Relative Density (water=1): Not available
- Solubility: Not available
- Partition Coefficient: n-octanal/water: Not available
- Auto-ignition Temperature: Not available
- Decomposition Temperature: Not available
- Viscosity: Not available
- Other Information: Not available

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Do not heat, throw into fire, disassemble, short circuit, immerse in water or overcharge, etc.
INCOMPATIBILITY:	None during normal operation. Avoid exposure heat, open flame, and corrosives.
HAZARDOUS POLYMERIZATION:	Will not occur.
HAZARDOUS DECOMPOSITION PRODUCTS:	The battery may release irritative gas if leaking electrolyte.

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11. TOXICOLOGICAL INFORMATION

The battery does not elicit toxicological properties during routine handling and use.
If the battery is opened through misuse or damage, discard immediately.
Internal components of cell are irritant and sensitization.

IRRITANCY:	The electrolytes contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause i rritation.
SENSITIZATION:	No information is available.
TERATOGENICITY:	No information is available.
CARCINOGENICITY:	No information is available.
MUTAGENICITY:	No information is available.
REPRODUCTIVE TOXICITY:	No information is available.

12. ECOLOGICAL INFORMATION

When properly used and disposed, the battery does not present an environmental hazard.
The battery does not contain mercury, cadmium, or lead.
Do not let internal components enter marine environment.
Avoid releasing to water ways, wastewater or ground water.

13. DISPOSAL CONSIDERATIONS

1. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable local requirements of hazardous waste treatment and hazardous waste transportation.

2. The battery should be completely discharged prior to disposal and/or the terminals taped or capped to prevent short circuit. When completely discharged it is not considered hazardous.

3. The battery contains recyclable materials. Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.

4. You must always obtain a Waste Transfer note from the specialist disposal company.

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14. TRANSPORT INFORMATION

According to PACKING INSTRUCTION 965 ~ 967 of IATA DGR 63rd Edition for transportation, the special provision 230 of IMDG (inc Amdt. 40-20):

- The batteries should be securely packed and protected against short-circuits.
- Examine packaging for damage or impact before shipping.
- Handle with care to avoid falling, dropping, and breakage.
- Prevent collapse of cargo piles.
- Do not put the goods together with oxidizer and chief food chemicals.
- The transport vehicle and ship should be cleaned and sterilized before transport.
- During transport, the vehicle should prevent exposure, rain, and high temperature.
- For stopovers, the vehicle should be away from fire and heat sources.
- When transported by sea, the assemble place should kept away from living quarters and kitchens, and isolated from the engine room, power and fire source.
- Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in residential or congested areas.

UN NUMBER :	UN3480
UN PROPER SHIPPING NAME:	LITHIUM ION BATTERIES
TRANSPORT HAZARD CLASS:	9
PACKING INSTRUCTION:	965 IA, 966 I, 967 I
MARINE POLLUTANT:	No
TRANSPORT IN BULK (according to Annex II of MARPOL 73/78 and the IBC Code)	No information available.
SPECIAL PRECAUTIONS:	No information available.

15. REGULATORY INFORMATION

The transport of rechargeable lithium-ion batteries regulated by the United Nations as detailed in the "model Regulations on the transport of dangerous Goods Ref. ST/SG/AC.10/1 Rev.21" Defined by the Seventh Revised Edition of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.7/Section38.3).The Lithium-ion Cells and the battery Packs may or may not be assigned to the UN3480 Class-9 that is restricted for transport.

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16. OTHER INFORMATION

The commissioner provides the composition information of batteries and promises its integrity and accuracy.

Users should read this file carefully and use the batteries in correct method.

Roamer Batteries Ltd does not accept responsibility or liability for any damage or loss because of misuse of batteries.

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