POWER EXTREME

Afri-Streme55 24M
Lithium Titanate Battery

Material Safety
Data Specifications

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Power Extreme Technologies
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Section 1: Chemical Product and Company Identification

Product Name:	AfriStreme55 Lithium Titanate Battery
Model Number:	AS 55-24M
Rating:	Nominal Voltage: 25.3V
Rated Capacity:	55Ah, 1391.5Wh
Weight:	34Kg
Manufacturer Name:	Power Extreme Technologies (PTY)LTD
Address:	Unit 4, 86 Oak Avenue, Highveld Techno Park, Centurion
Telephone No:	+27 87 152 0225
E-mail:	sales@powerextreme.co.za

Section 2: Hazards Summarizing

Danger sort: N/A

Hazard Classification:

This Power Extreme battery product meets the definition of an article. Under the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), "Articles" as defined in the Hazard Communication Standard (29 CFR 1910.1200) of the Occupational Safety and Health Administration of the United States of America, or by similar definition, are outside the scope of the system. [Rev. 2 (2007) Part 1.3.2.1.1

Hazard/Caution Statement:

- Do not open or disassemble.
- Do not expose to fire or open flame.
- Do not mix with batteries of varying sizes, chemistries or types.
- "Do not puncture, deform, incinerate or heat above 85°C (194°F)

The materials contained in this product may only represent a hazard if the integrity of the cell or battery is compromised; physically or electrically abused.

Routes of entry:

- Eyes and Skin – When leaking, the electrolyte solution contained in the battery irritates to ocular tissues and skin.
- Inhalation – Respiratory (and Eye) irritation may occur if fumes are released due to heat or an abundance of leaking batteries.
- Ingestion – The ingestion of the battery parts or chemical can be harmful. Content of open battery can cause serious chemical burns of mouth, oesophagus and gastrointestinal tract.

Health Harm:

Exposure to leaking electrolyte from ruptured or leaking battery can cause:

- Inhalation – Possible burns and irritation of the repository system, coughing, wheezing and shortness of breath.
- Eyes – Redness, tearing, burning. The electrolyte is corrosive to all tissues.
- Skin – The electrolyte is corrosive and may cause skin irritation and burns.
- Ingestion – The electrolyte solution causes tissue damage to throat and gastrointestinal track.

Environment harm:

Not necessarily under conditions of normal use.

Explosion danger:

- The battery may be explosive at high temperatures, above 150^{o}C or exposure to fire for prolonged times.

Section 3: Composition / Information on Ingredients

Substance/Preparation: Preparation		
Chemical Name	**Percentage of Content**	**CAS No**
Lithium Nickel Manganese Cobalt Oxide (Li(MixMnyCol-x-y)O2	35% ~ 45%	12190-79-3
Lithium Titanate ($Li_4Ti_5O_{12}$)	15% ~ 20%	12031-82-2
Poly Vinyline Fluoride (PVDF)	1% ~ 5%	24937-79-9
Acetylene Black	0.5% ~ 3%	1333-86-4
Aluminium (AL)	40% ~ 50%	7429-90-5
Electrolyte	10% ~ 15%	623-53-0/21324-40-3

Section 4: First Aid Measures

Skin Contact:

Not anticipated. If the battery is leaking and the contained materials contacts the skin, flush with copious amounts of clean water for at least 15 minutes.

Eye contact:

Not anticipated. If the battery is leaking and the contained materials contacts the eyes, flush with copious amounts of clean water for at least 15 minutes and get medical attention at once.

Inhalation:

Not anticipated. If the battery is leaking, move into fresh air. If irritation persists, consult a physician.

Ingestion:

Not anticipated. If the battery is leaking and the contained materials is ingested, rinse moth and surrounding area with copious amounts of clean water for at least 15 minutes. Consult a physician immediately for treatment.

Section 5: Fire Fighting Measures

Unusual Fire and Explosion Hazards:

The battery may explode or leak potentially hazardous vapours subject to: exposed to excessive heat, above the maximum rated temperature as specified, caused by fire for extended periods, over-charging, short circuit, punctured and/or crushed.

Hazardous Combustion Products:

Fire, excessive heat or over voltage conditions may produce hazardous decomposition products. Damaged batteries can result in rapid heating to a maximum temperature of around 75°C and the release of potential flammable vapours.

Extinguishing Media:

Dry Chemical type fire extinguishers with multipurpose dry chemicals that is effective on Class A, B, and C fires, are the most effective means to extinguish a battery fire. A CO_2 extinguisher will also work efficiently.

Fire Fighting Procedures:

Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is required. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Section 6: Accidental Release Measures

The material contained within the battery would only be released under abusive conditions. In the event of battery rupture and leakage, collect all the released materials that are not hot or burning in an appropriate waste disposal container while wearing proper protective clothing and ventilate the area. Placed in approved container and disposed according to the local regulations.

Section 7: Handling and Storage

Handling:

Batteries are designed to be recharged. However, improperly charging a battery may cause the battery to flame. When charging the battery, use dedicated chargers and follow the specified conditions.

Never disassemble or modify a battery.

Do not immerse, throw, and wet a battery in water.

Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid the inhalation of any vapours that may be emitted.

Short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short-circuited battery can cause skin burn.

Avoid reversing the battery polarity, which can cause the battery to be damaged or flame.

In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Measures.

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, nor expose it to direct sunlight for long periods.

Do not store batteries above 35^{o}C or below - 20^{o}C. Store batteries in a cool (about 20+-5^{o}C) in a long time, dry and ventilated area that is subject to temperature change. Elevated temperatures can result in reduced battery cycle life.

Section 8: Exposure Controls / Personal Protection

Engineering Controls: Keep away from heat and open flame.

Ventilation: Not necessary under conditions for normal use. In case of abuse, use adequate mechanical ventilation (local exhaust) for the battery that vent gas of fumes.

Respiratory Protection: Not necessary under conditions for normal use. If battery is burning leave the area immediately. During firefighting firemen should use self-contained breathing, full-face respiratory equipment. Fires may be fought but only from a safe firefighting distance, evacuate all persons from the area immediately.

Eye Protection: Not necessary under conditions for normal use. Use safety glasses with side shields if handling a leaking of ruptured battery.

Body Protection: Not necessary under conditions of normal use. Use rubber apron and protective working in case of handling a leaking of ruptured battery.

Protective Gloves: Not necessary under conditions of normal use. Use chemical resistant rubber gloves in handling a leaking or ruptured battery.

Others: Use good chemical hygiene practice. Wash hands thoroughly after cleaning-up a battery spill caused by leaking battery. No eating, drinking or smoking in battery storage area.

Section 9: Physical and Chemical Properties

State	Solid
Odor:	N/A
pH:	N/A
Vapor pressure:	N/A
Vapor density:	N/A
Boiling point:	N/A
Solubility in water:	Insoluble
Specific gravity:	N/A
Density:	N/A

Section 10: Stability and Reactivity

Stability:

Stable

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 to heat, open flame and corrosives.

Hazardous Polymerization:

Will not occur.

Hazardous Decomposition Products:

The battery may release irritative gas once the electrolyte leak.

Section 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 can cause irritation 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 irritation.

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.

Section 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.

Section 13: Disposal Considerations

Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in Federal, State or Local requirements of hazardous waste treatment and hazardous waste transportation.

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

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

Section 14: Transport Information

According to PACKING INSTRUCTION 965 – 967 or IATA DGR 60th Edition for transportation, the special provision 230 of IMDG (inc Amdt 38 – 16); The batteries should be securely packed and protected against short-circuits, where applicable – the AS 55-24M battery is a sealed unit without detachable parts that eliminates the possibility of short circuiting.

Examine whether the package of the containers is integrated and tightly closed before transportation. To ensure that the palletising and wrapping is secure, ensure cargo is prevented from falling, dropping or breakage during transportation.

Prevent collapse of the cargo stacks. Do not put the goods together with oxidizer and chief food chemicals. The transport vehicle and ship should be cleaned and sterilized before transport (where applicable). During transport, the vehicle should prevent exposure, rain and excessively high temperature. For stopovers, the vehicle should be away from fire and heat sources.

When transported by sea, the assemble place should keep away from bedroom and kitchen, 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, do not stop over in residential and congested areas.

a) UN number 3480&3481

b) UN Proper shipping name

LITHIUM ION BATTERIES (including lithium ion polymer batteries) or; LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)

c) Transport hazard class(es) 9

d) Packing Instruction (if applicable) 965 IA, 966 I, 967 I

e) Marine pollutant (Yes/No) No

f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code) No information available.

g) Special precautions
No information available.

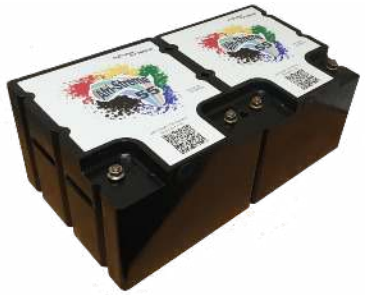
Section 15: Regulatory Information

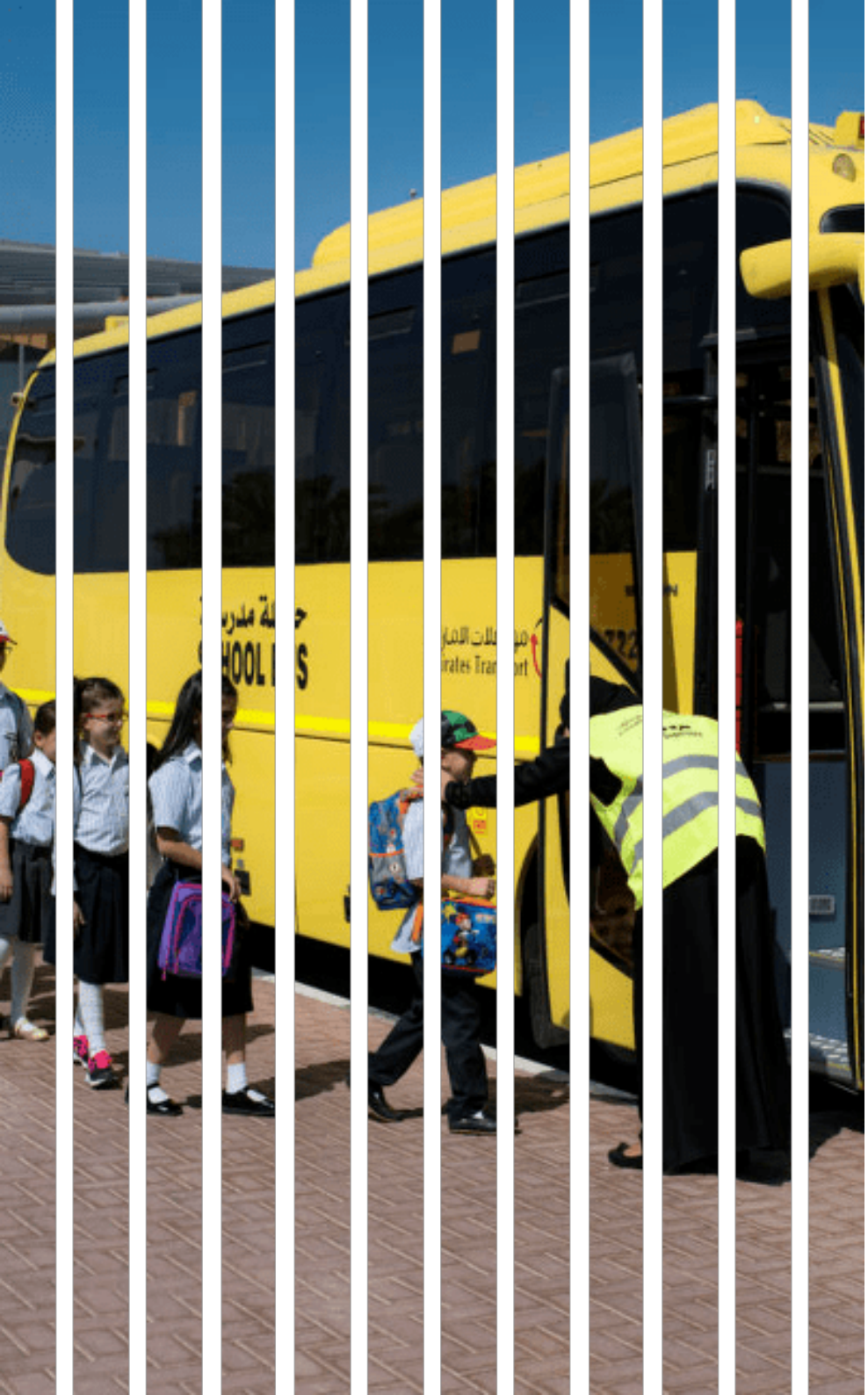
The transport of rechargeable lithium-ion batteries regulated by the United Nations as detailed in the “model Regulations on the transport of dangerous Goods Ref. ST/SG/AC. J10/1 Revision 19 2015”

Defined by UN in the “Recommendations of the transport of Dangerous Goods Chapter 38.3. Manual of Tests and Criteria Ref. ST/SG/AC.10.11 sixth revised edition 2015”. The Lithium-ion Cells and battery Packs may or may not be assigned to the UN No. 3480 Class -9 that is restricted for transport.

Section 16: Other Information

Prepared Department: Yinlong Energy and Power Extreme Technologies (Pty) Ltd.





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