

Safety Data Sheet

Mastervolt MLI Ultra 5000

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY			
1.1 Product: Rechargeable Li-ion battery			
Part number:	Description		
66015000	Mastervolt Li-Ion battery « MLI Ultra 12/5000 »		
66025000	Mastervolt Li-Ion battery « MLI Ultra 24/5000 »		
Important: The information in this Safety Data Sheet only applies to the Rechargeable Li-ion battery cells that are used in the above mentioned product(s). The information in this Safety Data Sheet does not apply to the electronics, wiring and housing of the product(s). Electrochemical system of the battery cells: mixed Lithium, Yttrium, Phosphide, Iron, Fluorine compound.			
Electrodes	Negative electrode Carbon/Graphite Nano Cellulose	Positive electrode LiFeYPO4	Binder Solvent
Electrolyte:	Solution of Lithium hexafluorophosphate (LiPF ₆) in a mixture of organic solvents*		
Rated voltage:	3.3 Volts per cell (MV Li-ion Battery consists of 8 cells)		
Energy (kWh) rating:	5 kWh per battery		
Net weight	58 kg / 128 lb. per battery		
* Ethylene Carbonate (EC) + DiEthyl Carbonate (DMC) + DiEthyl Carbonate (DEC) + Ethyl Acetate (EA).			
1.2 Supplier			
EU: Mastervolt BV Snijdersbergweg 93, 1105AN Amsterdam The Netherlands tel: INT. +31 20 3422100 info@mastervolt.com		USA: Power Products, LLC N85 W12545 Westbrook Crossing Menomonee Falls , WI 53051 United States of America Tel. 262-293-0600	
1.3 Emergency contact			
EU: tel: INT. +31 20 3422100		USA: tel: INT. +1 262-293-0600	

2. HAZARDS IDENTIFICATION
<p>The Rechargeable Li-ion battery cells described in this Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer.</p> <p>Under normal conditions of use, the solid electrode materials and liquid electrolyte they contain are non-reactive providing the battery integrity is maintained and the seals remain intact. There is risk of fire only in cases of abuse (mechanical, thermal, electrical), which leads to the activation of the safety valve and/or the rupture of the battery container.</p> <p>Electrolyte leakage, electrode materials reaction with moisture/water or battery vent/fire may follow, depending upon the circumstances. The Rechargeable Li-ion battery cells are fitted with a safety vent which will open in case of excessive internal pressure and/or temperature to avoid rupture of the cell casing.</p>

3. COMPOSITION OF THE LI-ION BATTERY CELLS			
Ingredient	Weight %	CAS No.	Notes
Rare Earth Y	40.5%	7440-65-5	---
Li ₂ CO ₃	16%	554-13-2	---
Mn	4.4%	7439-96-5	---
Ca	0.3%	7440-70-2	---
Graphite	5%	7782-42-5	---
Na	1.5%	7440-23-5	---
C	3.1%	7440-44-0	---
Fe	3.4%	7439-89-6	---
PE	3.3%	9002-88-4	---
Cu	10%	7440-50-8	---
Al	6%	7429-90-5	---
K	1.7%	7440-09-7	---
F	3.3%	7782-41-4	---
Sr	1.5%	7440-24-6	---

4. FIRST AID MEASURES

The Rechargeable Li-ion battery cells are considered as sealed units. Under normal operating conditions, the materials sealed inside should not be hazardous to people's health. Only when these materials are exposed during production or if the casing is broken or under extremely high temperatures (fire), they may be hazardous to people's health.

1. In case of battery rupture, fume or fire: Evacuate personnel from contaminated area and provide maximum ventilation to clean out fumes/gases. If batteries are on charge, shut off power to the charging equipment. In the meantime, spray the battery with water or put the smoking battery into basin at once. In all cases, seek medical attention.

2. In case the following occur, seek medical attention immediately:

Eye contact: Flush immediately with large amounts of water (eyelids held open) for at least 15 minutes;

Skin contact: Flush with large amounts of water and soap for at least 15 minutes; remove contaminated clothing completely, including shoes. Do not apply greases or ointments.

Ingestion: Dilute by giving plenty of water and get immediate medical attention. Assure that the victim does not aspirate vomited material by use of positional drainage. Assure that mucus does not obstruct the airway. Do not give anything by mouth to an unconscious person.

Inhalation: Move to fresh air immediately and ventilate the contaminated area. Give oxygen or artificial respiration if needed.

5. FIRE-FIGHTING MEASURES

1. Extinguishing media: Spray the battery with water or put the smoking / burning battery into water at once if the battery fumes or burns.

2. Appropriate extinguishing tools: Type D extinguishers, CO₂, Dry chemical or Foam extinguishers

6. ACCIDENT RELEASE MEASURES

The material contained within the batteries would only be expelled under abusive conditions. In case of battery rupture, or fume/fire under abuse, put the smoking /burning battery into water at once, or soak under water or spray with copious amounts of water. Place in approved container after cooling, and dispose in accordance with local regulations.

7. HANDLING AND STORAGE

The Rechargeable Li-ion battery cells should not be opened or destroyed nor incinerate since they may leak and release in the environment the ingredients they contain.

Handling: The Li-ion battery must be transported in its original or equivalent (i.e. non-conductive) packaging and in an upright position. Do not place upside down or on its side. Handle with care because Li-ion Batteries are sensitive to mechanical shock. Never lift the battery at the terminals. Only lift the battery at the handles.

Storage: To obtain maximum battery performance it is recommended to store the Li-ion battery in a cool and ventilated area away from moisture, sources of heat and open flames. Keep adequate clearance between walls and batteries. Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods. Do not directly heat or solder the batteries. Do not throw into fire. Do not mix Li-ion battery cells of different types and brands. Do not mix new and used Li-ion battery cells. Keep Li-ion battery its original or equivalent (i.e. non-conductive) packaging.

Other: Follow manufacturer's instructions for use and installation as described in the User's manual that is supplied with the Li-ion Battery

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8. CONTACT CONTROLS/PERSONAL PROTECTION

1. Keep out of reach from children

2. Avoid contact with skin in case of leaking or ruptured battery

3. Skin protection: Not necessary under normal use. Use rubber apron and gloves in case of handling a leaking or ruptured battery.

4. Eye protection: Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.

5. Respiratory protection: Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance

The Li-ion Battery consist of a gray colored plastic casing with green colored plastic parts fitted with two metallic main battery terminals and several communication/control terminals. Inside the casing of the Li-ion battery there are 8 Li-ion battery cells, consisting of yellow plastic cases with ribs, hermetically sealed and fitted with two metallic terminals. The Li-ion battery cells are electrically interconnected.

9.2 Chemical properties

Classification of dangerous substances contained into the product as per directive 67/548/EEC

Substance	CAS Number	Chemical Symbol	Melting point	Boiling point	Classification			Safety advices (2)
					Explosion limit	Indication of danger	Special risks (1)	
	12190-79-3	LiFeYPO4	> 1000°C	N/A			R22 R43	S2, S22, S24, S26, S36 S37, S43, S45
EC: 96-49-1 DMC: 616-38-6 DEC: 105-58-8 EA: 141-78-6		Organic solvents (DC-DMC DEC-EA)	EC: 38°C DMC: 4°C DEC: -43°C EA: -84°C	EC: 243°C DMC: 90°C DEC: 127°C EA: 77°C	None established OSHA	Inflammable	R21, R22 R41, R42/R43	S2, S24 S26, S36 S37, S45
21324-40-3		LiPF 6	N/A (decomposes at 160°C)	N/A	None established OSHA	Stimulator Corrosion	R14 R21, R22, R41, R43	S2, S8, S22 S24, S26, S36 S37, S45

(1) – Nature of Special risks:

R14: Reacts with water.

R21: Harmful in contact with skin.

R22: Harmful if swallowed.

R41: Risk of serious damage to eyes.

R42: May cause sensitization by inhalation.

R43: May cause sensitization by skin contact.

(2) – Safety advices:

S2: Keep out of reach from children.

S8: Keep away from moisture.

S22: Do not breathe dust.

S24: Avoid contact with skin.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.

S36: Wear suitable protective clothing.

S37: Wear suitable gloves.

S45: In case of incident, seek medical attention.

10. STABILITY AND REACTIVITY

Conditions to avoid: Temperatures above 85°C or fire. Deformation, mutilation, crushing, piercing, disassembling. Short circuit. Prolonged exposure to humid conditions.

Materials to avoid: N/A

Hazardous decomposition products:

Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium hexafluoro-phosphate (LiPF₆) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

11. TOXOLOGICAL INFORMATION

Mastervolt Rechargeable Li-ion batteries do not contain toxic materials.

12. ECOLOGICAL INFORMATION

When properly used and disposed (i.e. in accordance with the directions stated in the User's manual), Mastervolt Rechargeable Li-ion batteries can be recycled and do not present environmental hazard during and after their life time.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with the applicable regulations which vary from country to country. Refer to the directions in the User's manual. Avoid short circuits! The terminals of the Mastervolt Rechargeable Li-ion batteries and/or Li-ion battery cells must be insulated prior to disposal. Do not dispose of the Li-ion batteries and/or Li-ion battery cells into fire.

13.1 Incineration

Incineration should never be performed by users of the battery but can eventually be performed by trained professionals in authorized facilities with proper gas and fumes treatment, all in accordance with locally applicable laws.

13.2 Recycling

Spent batteries may not be mixed with domestic or industrial waste but must be collected and recycled separately. Contact your supplier for recollection and recycling of batteries or contact an authorized waste management company.

14. TRANSPORTATION

Mastervolt MLI Ultra 12/5000 and 24/5000 Li-Ion battery and/or Li-ion battery cells must be transported in its original or equivalent package and in an upright position. Never lift the battery at the terminals. Only lift the battery at the handles. The batteries must be protected against short circuits, slipping, upsetting or damaging.

14.1 Transportation information

Mastervolt Rechargeable Li-ion batteries are tested according to UN Manual of Tests and Criteria, Part III, subsection 38.3.



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14.2 Transport classification

Air transport (ICAO/IATA):

UN 3480 Lithium ion batteries, Class 9, packing instruction 965, Section IA

Rail transport (RID):

UN 3480 Lithium ion batteries, Class 9, packing instruction P903

Road transport (ADR):

UN 3480 Lithium ion batteries, Class 9, packing instruction P903

Sea transport (IMDG code):

UN 3480 Lithium ion batteries, Class 9, packing instruction P903

Note:

Damaged or defective or waste lithium ion batteries are forbidden for transport by air.

These batteries can only be transported by road, rail or sea in compliance with packaging instruction P908 of the applicable transport regulation for damaged or defective batteries or packing instruction P909 for batteries which are shipped for disposal or recycling.

15. REGULATORY INFORMATION

The following EU directives are applicable for the Rechargeable Li-ion battery cells:

- 2006/66/EC: Battery directive

The following EU directives are applicable for the electronics used in the Mastervolt Rechargeable Li-ion batteries:

- 2014/35/EU: Low Voltage Directive
- 2014/30/EU: EMC directive
- 2011/65/EU: RoHS Directive

16. OTHER INFORMATION/DISCLAIMER

Avoid mechanical or electrical abuse. DO NOT short circuit or install incorrectly. The Li-ion battery may explode, pyrolize or vent if disassembled, crushed, recharged incorrectly or exposed to high temperatures. Install and use the Li-ion battery in accordance with the instructions provided in the user's manual.

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