

Safety Data Sheet

Mastervolt MLs Batteries

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

1.1 Product: Mastervolt Lithium Iron Phosphate Battery

Part number:	Model	Nominal voltage:	Rated Capacity:	Weight
65010006	MLs 12/80	12.8V	6Ah / 77Wh	825 gram
65010010	MLs 12/130	12.8V	10Ah / 128Wh	1460 gram
65010020	MLs 12/260	12.8V	20Ah / 256Wh	3160 gram
65010030	MLs 12/390	12.8V	30Ah / 384Wh	4600 gram
65020010	MLs 24/260	25.6V	10Ah / 256Wh	3160 gram

Important: The information in this Safety Data Sheet only applies to the rechargeable 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).

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

The batteries described in this Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer. 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.

Danger sort: N/A

Routes of entry:

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

Health harm:

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

1. Inhalation – Burns and irritation of the respiratory system, coughing, wheezing, and shortness of breath.
2. Eyes – Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues
3. Skin – The electrolyte is corrosive and causes skin irritation and burns
4. Ingestion – The electrolyte solution causes tissue damage to throat and gastrointestinal tract

Environment harm: Not necessary under conditions of normal use.

Explosion danger: The battery may be explosive at high temperatures (above 150°C) or exposing to fire.

3. COMPOSITION OF THE BATTERY CELLS

Chemical Name	Weight %	CAS No.	Notes
Lithium Iron Phosphate Battery (LiFePO ₄)	25% ~ 30%	12057-17-9	---
Graphite (C)	8% ~ 12%	7782-42-5	---
LiCFP ₆	15% ~ 22%	21324-40-3	---
Aluminium (Al)	5% ~ 8%	7429-90-5	---
Copper (Cu)	10% ~ 15%	7440-50-8	---
High molecular polymer	3% ~ 5%	---	---
Nickel (Ni)	0.5% ~ 1%	7440-02-0	---
Iron (Fe)	22% ~ 30%	7439-89-6	---

Safety Data Sheet

Mastervolt MLs Batteries

4. FIRST AID MEASURES

The batteries 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 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

Unusual Fire and Explosion Hazards: Battery may explode or leak potentially hazardous vapors subject to: exposed to excessive heat (above the maximum rated temperature as specified by the manufacturer) or fire, over-charged, short circuit, punctured and crushed

Hazardous Combustion Products: Fire, excessive heat, or over voltage conditions may produce hazardous decomposition products. Damaged batteries can result in rapid heating and the release of flammable vapors

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

Fire Fighting Procedures: Use a positive pressure self-contained breathing apparatus of 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.

6. ACCIDENT 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. Place in approved container and dispose in accordance with local regulations.

7. HANDLING AND STORAGE

The batteries should not be opened or destroyed nor incinerate since they may leak and release in the environment the ingredients they contain.

Handling:

1. The 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 batteries are sensitive to mechanical shock. Never lift the battery at the terminals.
2. 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 instructions.
3. Never disassemble or modify a battery.
4. Do not immerse, throw and wet a battery in water.
5. Should a battery unintendedly be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid the inhalation of any vapors that may be emitted.
6. Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods. 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.
7. Avoid reversing the battery polarity, which can cause the battery to be damaged or flame.
8. Do not directly heat or solder the batteries. Do not throw into fire. Do not mix batteries of different types and brands. Do not mix new and used batteries.
9. In the event of skin or eye exposure to the electrolyte, refer to Section 4, First Aid Measures

Storage:

1. Batteries should be separated from other materials and stored in a noncombustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Keep batteries away from moisture, sources of heat and open. Do not expose to direct sunlight for long periods.
2. Do not store batteries above 35°C or below -20°C. Store the battery in a cool (about 20±5 °C), dry and ventilated area, that is subject to little temperature change. Elevated temperatures can result in reduced battery cycle life. Battery exposure to temperatures in excess of 60°C will result in the battery venting flammable liquid and gases.
3. Keep the battery its original or equivalent (i.e. non-conductive) packaging until use and do not jumble them.

Other:

1. Follow manufacturer's instructions for use and installation as described in the User's manual that is supplied with the battery
2. Keep batteries out of reach from children.

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 (local exhaust) for the battery that vent gas or fumes)

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

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

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

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

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

Safety Data Sheet

Mastervolt MLs Batteries

9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Appearance	
The battery consists of a gray colored plastic casing with green colored plastic parts fitted with two metallic main battery terminals.	
9.2 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

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 heat, open flame and corrosives.	
Hazardous Polymerization: Will not occur.	
Hazardous Decomposition Products: The battery may release irritative gas once the electrolyte leakage.	

11. TOXOLOGICAL 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 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	

12. ECOLOGICAL INFORMATION	
<ol style="list-style-type: none"> The battery complies with the legal requirements as stipulated in European Directives 2006/66/EC (“Battery directive”). When properly used and disposed (i.e. in accordance with the directions stated in the User’s manual), the battery does not present 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	
<ol style="list-style-type: none"> 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. Avoid short circuits! The battery should be completely discharged prior to disposal and/or the terminals must be insulated prior to disposal. When completely 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 carrier. Do not dispose of the battery cells into fire. 	

14. TRANSPORTATION

Mastervolt MLs batteries must be transported in its original or equivalent package and in an upright position. Never lift the battery at the terminals. The batteries must be protected against short circuits, slipping, upsetting or damaging.

14.1 Transportation information

Mastervolt MLs batteries are successfully tested in accordance with the UN Manual of Tests and Criteria, part III, sub-section 38.3.



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:

- 2014/30/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 Mastervolt MLs battery may explode, pyrolize or vent if disassembled, crushed, recharged incorrectly or exposed to high temperatures. Install and use the MLs battery in accordance with the instructions provided in the user's manual.

The information in this document has been compiled from sources considered to be dependable and is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.

This information relates to the specific materials designated and may not be valid for such material used in combination with any other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his particular use.

Mastervolt does not accept liability for any loss or damage that may occur whether direct, indirect, incidental or consequential, from the use of this information. Mastervolt does not offer warranty against patent infringement. Additional information is available by calling the telephone number above designated purpose.

Last update: 9 March 2017

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT