MATERIAL SAFETY DATA SHEET

Model: All lithium-ion rechargeable polymer batteries. Last revised: 04.02.2016

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Lithium-ion polymer rechargeable batteries
MODEL/SIZE: All

Name: Johannes J. Matthies GmbH & Co. KG
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2. COMPOSITION/INFORMATION ABOUT CONSTITUENTS

CONSTITUENTS	CONTENT (percent of total weight)	CAS NO.	EINECS
LITHIUM IRON PHOSPHATE CARBON COATED (LiFePO4)	28%	15365-14-7	N/A
Carbon (Graphite)	12%	7782-42-5	231-955-3
PP	5%	9003-07-0	N/A
PVDF	2%	24937-79-9	N/A
PE	5%	9002-88-4	N/A
CMC	0.5%	9004-32-4	N/A
LiPF6	9%	21342-40-3	244-334-7
EC	9%	96-49-1	202-510-0
DMC	9%	616-38-6	210-478-4
Cu	13%	7440-50-8	231-159-6
Al	7%	7429-90-5	231-072-3
SBR	0.5%	9003-55-8	N/A

3. HAZARDS/HEALTH RISKS

Intact batteries do not present any particular hazards. If the battery has been damaged, avoid any contact between the material leaking from the battery and your skin or eyes. If the battery is burning, use the appropriate agent to extinguish the fire.
Overview of Emergency Measures (Including Indications and Symptoms, Possible Means of Contact, Etc.):
Eyes: No risks from intact batteries. If the battery has been damaged, exposure to chemicals leaking from the battery can cause irritation or chemical burns to the eyes.
Skin: No risks from intact batteries. If the battery has been damaged, exposure to chemicals leaking from the battery can cause irritation or chemical burns to the skin.
Inhalation: No risks from intact batteries. If the battery has been damaged, exposure to fumes leaking from the battery can cause difficulty in breathing or irritation or chemical burns to the respiratory system.
Ingestion: Never swallow the battery or parts of the battery. Exposure to the chemicals it contains can cause severe harm to the mouth and digestive organs.
Environmental pollution: Chemicals leaking from a damaged battery can pollute the environment.
Burning batteries: If a battery is short-circuited, overloaded, or highly overheated, electrolytes may be released or, in extreme cases, the battery may explode.

4. FIRST-AID MEASURES

Skin contact: If there is contact between the electrolytes leaking from the battery and your skin, rinse the affected area with clear water for a minimum of 15 minutes. Do not attempt to neutralize the electrolyte. Seek medical attention immediately.
Eye contact: If there is contact between the electrolytes leaking from the battery and your [eyes], rinse the affected area with clear water immediately. Do not attempt to neutralize the electrolyte. Seek medical attention immediately.
Inhalation: Leave the area immediately, rinse your mouth and face, and seek medical attention immediately.
Ingestion: Seek medical attention immediately.

5. DATA REGARDING FIRE-FIGHTING AND RISK OF EXPLOSION

Hazard properties: The rechargeable battery can overheat owing to external and internal short circuits, and toxic fumes can be released from burning batteries.
Hazardous combustion products: Metal oxide, carbon monoxide (CO), carbon dioxide (CO2), etc.
Extinguishing agent: Special D fire extinguishers containing chemical dry powder, yellow sand. Do not use water.
Fire-fighter safety: Fire-fighters should wear fire-fighting suits and self-contained breathing apparatus.

6. MEASURES IN CASE OF ACCIDENTAL RELEASE

Leakage of small amounts: If there are indications that the battery is no longer sealed, avoid any contact of skin or eyes with the material leaking from the battery. Wear chemical-resistant leather gloves and use non-flammable, absorbent material to clean the battery. Speak to the plant environmental protection office to determine the proper means of disposal.

7. HANDLING AND STORAGE

—Do not allow the battery to vibrate strongly.
—Avoid any short-circuiting of the battery. The high temperature which can result entails a risk of the battery beginning to burn or exploding.
—When packing and shipping the battery, make sure that the packing and equipment securing the load cannot cause a short circuit.

Storage:
—Store the battery in a cool (i.e., <130° F [54.4° C]), dry, and well-ventilated area.
—If batteries will be stored for a longer period of time, we recommend a charge level of 40% to 60%.
—Keep batteries away from direct sunlight, heat, or open flame.

8. PERSONAL PROTECTION

Hygienic rules: No additional protective measures are required for normal handling and normal packaging.
Respiratory protection in case of fire: Self-contained breathing apparatus
Eye protection: No additional protective measures are required for normal handling and normal packaging. Wear safety glasses as appropriate to the situation.
Skin protection: No additional protective measures are required for normal handling and normal packaging. Wear rubber gloves as appropriate to the situation.

9. PHYSICAL AND CHEMICAL PROPERTIES

State and appearance: Solid

Color: Aluminious white	Odor: No
Voltage: 2.75–48 V	Weight: 10–4,000 g
Capacity: 100–4.0000 mAh	Function: Power supply

10. STABILITY AND REACTIVITY

Stable or instable: Stable
Incompatibility (materials to be avoided): Electrical materials, water, seawater, oxidation agents, acid
Conditions to be avoided: Avoid electric short circuits, high mechanical stress, repairs of a damaged battery, high temperatures, strong sunlight, high relative humidity
Dangerous decomposition products: Toxic gases are released during combustion.
Decomposition temperature (0° F [-17.8° C]): Not applicable
Dangerous polymerization: Does not occur

11. TOXICOLOGICAL INFORMATION

CAS NO.	RETCS
15365-14-7	None listed
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

Acute toxicity:
Constituent: Hydroxide methyl cellulose sodium
— LC50: > 5,800 mg/m³/4h
— LD50: > 27 g/kg

Constituent: LiPF6
— LD50: > 1,702 mg/kg

Constituent: Ethylene carbonate
— LD50: > 10,000 mg/kg
— LD50: > 3,000 mg/kg

Constituent: Dimethyl carbonate
— LD50: > 6,000 mg/kg (small rat, orally)

— LD50: > 13,000 mg/kg (large rat, orally)

Irritation: **NA**

Carcinogenicity:
Constituent: Nickel
— LARC-2B: Potential carcinogen
— ACGIH A5: Non-human carcinogen
Other constituents: Not listed under ACGIH, IARC, NTP

12. ECOLOGICAL INFORMATION
Ecotoxicity: The chemicals in the battery cause environmental pollution if they are released into the environment.
Biodegradability: No information available
Non-degradability: No information available

13. DISPOSAL (batteries must not be placed in household waste)
The rechargeable JMT lithium-ion polymer cells and batteries do not contain any toxic metals, only trace elements which occur naturally. We recommend contacting municipal or state authorities for advice because the regulations for disposal can vary from one location to another. Batteries can be returned at collective recycling systems.

14. INFORMATION ABOUT TRANSPORT
Rechargeable lithium-ion polymer batteries < 100 Wh UN No. 3480
ADR: Simplified handling subject to compliance with Special Provision 188 provided that the requirements of UN, Chapter 38.3, have verifiably been met.
All other requirements regarding marking, labeling, packaging, and quantity units must be observed.
IATA (DGR): Simplified handling subject to compliance with Packing Instruction 965, Part II. All other requirements regarding marking, labeling, packaging, and quantity units must be observed.
IMDG: Simplified handling in accordance with Class 9 subject to compliance with Packing Instruction P903. All other requirements regarding marking, labeling, packaging, and quantity units must be observed.

15. INFORMATION ABOUT REGULATIONS
Regulations for secure handling, production, storage, transport, and load of hazardous chemicals must be observed.

16. MISCELLANEOUS INFORMATION
No warranties of any kind are given on the data contained in this material safety data sheet. Users should regard these data to be strictly supplementary to other information they have obtained and decide autonomously whether the information from any specific source is appropriate and complete and can ensure the proper use and disposal of this material as well as the safety and health of associates and customers.
Translated from English.

THE TRANSPORT REGULATIONS CURRENTLY IN FORCE AT THE TIME OF DISPATCH APPLY.