Safety Data Sheet

LITHIUM-ION-BATTERY/-SPARE BATTERY for ATOM/CORE

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SECTION 1: Identification of the substance/mixture and of the company

1.1 Product identification

Trade name: **Battery/Spare battery ATOM/CORE**
Nominal voltage: 7,2 Volt
Wh rating: 48,8 Wh
Rated Capacity: 6800 mAh

Application of the Substance/preparation: Rechargeable Lithium Ion battery (Li-Ion) for hobby applications in functional RC model construction

1.2 Relevant application of products

The above-mentioned batteries and equipment contained with these batteries produced by PowerBox-Systems are covered by this Material Safety Data Sheet.

1.3 Details of the supplier of the Material Safety Data Sheet

Manufacturer/Supplier: PowerBox-Systems GmbH
Dr.-Friedrich-Drechsler-Straße 35
86609 Donauwörth

Telephone: +49 (0) 906 99999-200
E-mail: sales@powerbox-systems.com

1.4 24-hour emergency contact:

Telephone: +49 (0) 8679 7-2222
Telefax: +49 (0) 8679 7-4643

SECTION 2: Hazards identification

2.1 Classification of the substance/mixture

Classification according to Regulation 67/548/EEC (DSD) oder 1999/45/EC (DPD)

These batteries are products according to Regulation (EEC) No 67/548 or Regulation 1999/45 (EEC). Health injuries are not known or expected under normal use.

Direct heat or destruction

Leaking liquid: Flammable, causes irritation to eyes and/or skin with contact. Vapour may be irritating to the respiratory system, eyes and skin.

Environment hazards

According to the present state of knowledge negative ecological effects are not expected.

2.2. Label elements

Pictograph/hazard symbol


Xn – harmful


F – highly flammable


C – corrosive

Hazard statements and Risk-Phrases
See chapter 8

Safety instructions and safety phrases
See chapter 8

2.3 Other hazards
Environmental risks: These products do not contain PBT nor vPvB substances.
Other risks: No further hazards have been detected to the present level of knowledge.

SECTION 3: Composition/Ingredients Information

3.1 Ingredients

Component	by Wt.	CAS Number
Aluminum Foil	2-10 %	7429-90-5
Nickel compound (proprietary)	0-80 %	
Manganese compound (proprietary)	0-15 %	
Cobalt compound (proprietary)	0-15 %	
Styrene-Butadiene-Rubber	< 1 %	
Polyvinylidene Fluoride (PVDF)	< 5 %	24937-79-9
Copper Foil	2-10 %	7440-50-8
Carbon (proprietary)	10-30 %	7440-44-0
Elektrolyte* (proprietary)	10-20 %	
Steel, Nickel and inert materials	Remainder	N/A

(*) Main ingredients: Lithium hexafluorophsophate, organic carbonates
Because of the cell structure the dangerous ingredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.
Mercury content: Hg < 0.1 mg/kg
Cadmium content: Cd < 1mg/kg
Lead content: Pb < 10mg/kg

SECTION 4: First-aid measures

General information:
The following first aid measures are required only in case of exposure to interior battery components after damage of external battery casing. This battery contains organic electrolyte. If batteries show signs of leaking, follow instructions below:

4.1. Description of first-aid measures
Undamaged, closed cells do not represent a danger to health.
Inhalation
Move to fresh air and rest calm. Fresh air or supply of oxygen; seek medical attention immediately.
Skin contact
Wash off the affected area immediately with plenty of water and seek medical attention immediately.
Eye contact
Rinse immediately open eyes with plenty of water, also under eyelids, for at least 15 minutes and seek medical treatment by eye specialist.

Ingestion
Drink plenty of water. Seek medical attention immediately.

4.2 Most important acute and delayed symptoms and effects
Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media
Suitable extinguishing media: Water spray, carbon dioxide, dry chemical
Cold water and dry powder in large amount are applicable.
Use metal fire extinction powder or dry sand if only few batteries are involved.

5.2 Hazardous combustion, fire and explosion
May form hydrofluoric acid if electrolyte comes into contact with water.
When heated to very high temperatures or in the event of fire, toxic and hazardous gases can be released: Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide.
Combustion produces irrigating smoke.

5.3 Advice for firefighters
Use self-contained breathing apparatus. Wear fully protective suit.
Do not inhale explosion and/or combustion gases. Ensure sufficient ventilation.
If possible, remove batteries from fire-fighting area. If heated above 125°C, battery cells can explode/vent.
Cells are not flammable but internal organic material will burn if the cells are incinerated.
Sweep up and place in a suitable container, dispose of waste according to local, state and federal laws and regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency measures
Wear protective equipment. Evacuate unprotected personnel from hazard area.
Avoid contact with skin, eyes and clothing. Avoid breathing fume and gas. Keep away from sources of ignition – no smoking. Provide adequate ventilation.

6.2 Environmental precautions
Do not lead into aquatic, environments, ground or sewer system.
Leaking fluid: Environmental hazards cannot be excluded.
Sweep up or vacuum up spillage and collect in suitable container for disposal.

6.3 Methods and material for containment and cleaning up:
Absorb with liquid binding material (universal binders) and dispose of it properly.

SECTION 7: Handling and storage

7.1 Handling
Do not connect positive and negative poles of the battery with electrically conductive materials.
Do not disassemble and damage the battery.
Avoid short-circuiting the battery.
Precautions against fire and explosion:
Do not throw batteries into fire and protect them against extreme temperatures (> 125°C)

7.2 Conditions for safe storage, including any incompatibilities

Further information concerning storage conditions

Storage: at 10V to 17V

Requirements to be met by storerooms and receptacles:

Avoid direct sunlight, high temperature and high air humidity.

Store dry at approx. 20 ~ 60% nominal capacity and tightly closed in the original container in a cool, well-ventilated place at room temperature (approx. 20°C).

Combined Storage:

Do not store together with oxidizing and acidic materials as well as electrically conductive materials.

Store away from water.

Further information concerning storage conditions:

The battery should be stored with 40-60% charging capacity.

Avoid storing in areas with static electricity

Storage category:

According to storage category of VCI (1991): 11

7.3 Specific end-use

Industry or sector specific guidance

No further relevant information available.

SECTION 8: Limitation and monitoring of exposure / personal protective equipment

8.1 Exposure limits

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt oxide	R22;R43;R50/53	S24;S37;S60;S61	Xn (Harmful) N (Dangerous for the environment)	0.1 mg/m3 (TWA)
Manganese (VI) oxide	R20/22	S25	Xn (Harmful)	**Airborne Exposure Limits:** - OSHA Permissible Exposure Limit (PEL): 5 mg/m3 Ceiling for manganese compounds as Mn - ACGIH Threshold Limit Value (TLV): 0.2 mg/m3 (TWA) for manganese, elemental and inorganic compounds as Mn
Nickel oxide	R43,R49,R53	S45,S53,S61	T (Toxic)	**Airborne Exposure Limits:** For Nickel, Metal and Insoluble Compounds, as Ni: - OSHA Permissible Exposure Limits (PEL) - 1 mg/m3 (TWA). For Nickel, Elemental / Metal: - ACGIH Threshold Limit Value (TLV) - 1.5 mg/m3 (TWA), A5 - Not suspected as a human carcinogen. For Nickel, Insoluble Compounds, as Ni: - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m3 (TWA), A1 - Confirmed human carcinogen

Carbon	R36/37/38, R36/37 R20, R10	S22;S24/25	F (Highly Flammable) Xn (Harmful) Xi (Irritant)	**Airborne Exposure Limits:** - OSHA Permissible Exposure Limits (PELs): activated carbon (graphite, synthetic): Total particulate = 15 mg/m3
Aluminium foil	R17,R15,R36/38, R10,R67,R65,R62,R51/53, R48/20, R38,R11,	S7/8,S43,S26,S62,S61, S36/37, S33,S29,S16,S9	F (Highly Flammable) Xn (Harmful) Xi (Irritant)	**Airborne Exposure Limits:** - OSHA Permissible Exposure Limit (PEL): 15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA) repairable fraction for Aluminum metal as Al -ACGIH Threshold Limit Value (TLV): 10 mg/m3 (TWA) Aluminum metal dusts
Copper foil	R11 R36 R37 R38	S5,S26,S16,S61, S36/37	F (Highly Flammable) N (Dangerous for the environment) Xn (Harmful) Xi (Irritant)	Copper Dust and Mists, as Cu: - OSHA Permissible Exposure Limit (PEL) - 1 mg/m3 (TWA) - ACGIH Threshold Limit Value (TLV) - 1 mg/m3 (TWA) Copper Fume: - OSHA Permissible Exposure Limit (PEL) - 0.1 mg/m3 (TWA) - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m3 (TWA)
Polyvinylidene fluoride (PVDF)	S22;S24/25			

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation.
During normal charging and discharging there is no release of product.
No specific precautions necessary.

8.2.2 Individual protection measures – personal protection equipment

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Respiratory protection
A breathing apparatus is normally not required.

Hand protection
Hand protection is normally not required.

Eye protection
Eye protection is normally not required.

Body protection
NA.

Hygiene measures
When using do not eat, drink or smoke. Wash hands before breaks and after work.

General safeguard measures
Personal protective equipment should be selected specifically for the working place depending on concentration and quantity of dangerous substance.

8.2.3 Limitation and monitoring of exposure
See chapter 6 + 7

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Odour:	non- applicable
Odour threshold:	not determined
pH-level:	non-applicable
Melting point/freezing point:	not determined
Initial boiling point/boiling point:	non-applicable
Flashpoint:	non-applicable
Flammability (solid, gaseous):	not determined
Upper/Lower flammability or explosive limit:	non-applicable
Vapour pressure:	not determined
Vapour density:	not determined
Relative density:	not determined
Solubility:	non-applicable
Partition coefficien n-octanol/water:	not determined
Auto-ignition temperature :	non-applicable
Decomposition temperature:	not determined
Viscosity:	no relevant
Explosive properties:	not determined
Oxidizing characteristics:	not determined

9.2 Other information

Evaporation rate:	not relevant

SECTION 10: Stability and reactivity

10.1 Reactivity
None-known when used in accordance with instructions.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of generating hazardous reactions
None-known when used in accordance with instructions.

10.4 Conditions to avoid
Keep away from open flames, hot surfaces and sources of ignition. Avoid intense sunlight for a long time.
Do not puncture, crush or incinerate.

10.5 Incompatible materials
Metals, electrically conductive materials, water, sea water, strong oxidizing agent and strong acids.

10.6 Hazardous decomposition products
No decomposition if used according to specifications.
Hydrofluoric acid or carbon monoxide will be released in case of open cells.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Not determined
Primary irritant effect on the skin
Ingredients may cause irritation to the eyes and/or skin and mucous membrane.
Caustic effect
Not determined
Sensitization
Not determined
Carcinogenicity
Not determined
Mutagenicity
Not determined
Reproductive toxicity
Not determined
Additional toxicological information:
This product is not subject to classification according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version.
In our experience an according to the literature provided to us the product does not cause any noxious effects when used properly.

SECTION 12: Environmental information

12.1 Toxicity
Ecological injuries are not known or expected under normal use. Do not flush into surface water or sanitary sewer system.

12.2 Persistent and degradability
Not determined

12.3 Bioaccumulation potential
Not determined

12.4 Mobility in the soil
Not determined

SECTION 13: Disposal considerations

13.1 Physical and chemical characteristics
Disposal in accordance to national and local regulations and by-laws and for recycling consult manufacturer.

SECTION 14: Transport information

14.1 UN-Number ADR,	UN 3480 Lithium ion batteries (including Lithium Ion Polymer Batteries)
IMDG, IATA	UN 3480 Lithium ion batteries
UN-Number ADR,	UN 3481 Lithium Ion batteries packed with equipment
IMDG, IATA	UN 3480 Lithium ion batteries packed with equipment

Transport hazard class

Classification code:	M 4
Transport category:	2
Limited quantity:	LQ 0
Hazard label:	

Edition of transportation: Li-Ion Battery comply with the IMDG CODE SP188.

14.2 UN propper shipping name

ADR/RID

Li-Ion Battery comply with the IMDG CODE SP188.

IMDG-Code / ICAO-TI / IATA-DGR

UN 3480 Lithium ion battery / UN 3481 Lithium ion battery packed with equipment.
Not restricted – no dangerous goods transport, applying packing instruction 965 - 967.

14.3 Transport hazard classes

ADR, IMDG, IATA: 9 Miscellaneous dangerous substances and articles

14.4 Packing group

Packing group: II

14.5 Environmental risks

Hazardous substance mark

ADR/RID / IMDG-Code / ICAO-TI / IATA-DGR: yes / no

14.6 Special warnings and precautions for use: Attention: Miscellaneous dangerous substances and articles F-A,S-I

corresponding details see chapter 6 to 8.

14.7 Bulk transport according to Annex II of MARPOL 73/78 and the IBC-Code

Pollution category (X, Y oder Z):	not applicable
Type of vessel (1, 2 or 3):	not applicable

Our products are properly classified, described, packaged, marked and labelled and meet the conditions for transport in accordance with all applicable international and national government regulations, not limited to those mentioned above. We further certify that the enclosed products have been tested and meet the requirements and conditions in accordance with the UN Recommendations (T1-T8) for the regulations on the transport of dangerous goods and the Manual of Tests and Criteria.

United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (38.3 Lithium batteries)		**Test result**	**Comment**
No.	**Test procedure**		
T1	Altitude simulation	passed	
T2	Thermal testing	passed	
T3	Vibration	passed	
T4	Impact	passed	
T5	External short circuit	passed	
T6	Impact/contusion	passed	
T7	Overloading	passed	Only for packs or individual cells
T8	Forced discharge	passed	

SECTION 15: Regulations

15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture

EU regulations
2006/66/EC; 93/97/EEC

National regulations: General Classification Guideline for Preparations of the EC (BetrSichV): n/a

Names of substances proposed for identification as Substances of Very High Concern (SVHC) according to REACH, Article 57: none

Transportation regulations
ADR (2019); IMDG (2019); IATA (2019, 60th Edition)

VOC (1999/13/EG)
0 %

15.2 Safety assessment
A safety assessment for substances in these preparations was not performed.

SECTION 16: Other information

Abbreviations and acronyms

ADN/ADNR	Regulations concerning the transport of dangerous substances in barges on inland waterways
ADR/RID	European agreement concerning the international carriage of dangerous goods by road/regulations concerning the international carriage of dangerous goods by rail
OEL/BLV	Occupational Exposure Limit /Biological Limit Value
AOX	Adsorbable Organic Halogens
CAS	Chemical Abstract Service Number
CLP	Classification, Labelling and Packing
DSD	Dangerous Substance Directive
DPD	Dangerous Preparation Directive

IATA	International Air Transport Associations
IMDG	International Maritime Dangerous Goods
PBT	Persistent, Bioaccumulative, Toxic
UVCB	Substances of unknown or variable composition, complex reaction products or biological materials
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WHC	Water Hazard Class according to the Administrative Regulation on Substances Hazardous to Water (VwVwS)

Key literature references and sources for data
not available

Classification of substances or mixtures and primary method used
Not specified