

# Material Safety Data Sheet (MSDS)

16. March 2024

## **SECTION 1: Product and Company Identification**

Name of Product:	Lithium-Ion battery pack
Model:	All models listed in the below table
Name of company:	bebob factory GmbH
Address:	Höglwörther Str. 350 81379 Munich Germany
Telephone number:	+49 (0)89 8563 485-0
Email / Website	<a href="mailto:info@bebob.de">info@bebob.de</a> / <a href="http://www.bebob.de">www.bebob.de</a>
Emergency contact:	+49 (0)178 433 74 34 / +49 (0)89 8563 485-0

## **SECTION 2: Hazards Identification**

The chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion or chemical danger of hazardous material leakage and the product is safe.

However, mishandling and/or misuse can cause serious damage to the product and there will be the possibility of generation of smoke or rupturing metals, flaming or acid gas emission or electrolyte leakage.

Most important hazards and effects:

Human health effects:

- Inhalation: the vapour of the electrolyte has an anaesthetic effect and stimulates the respiratory tract.
- Skin contact: the vapour of the electrolyte stimulates the skin. An electrolyte/skin contact can cause sores and stimulation of the skin.
- Eye contact: the vapour of the electrolyte irritates eyes. An electrolyte-eye contact can cause sores and irritation of the eye. In particular, substances that cause a strong inflammation of the eyes are contained within.

Environmental effects: A battery pack is to be disposed according to regulation procedures.

Specific hazards:

If the electrolyte comes into contact with water, it can generate detrimental hydrogen fluoride.

Since the leaked electrolyte is an inflammable liquid it should not be brought close to fire.

### SECTION 3: Composition/Information on Ingredients

#### COMPOSITION / INFORMATION ON INGREDIENTS OG BATTERY CELLS

- Substance or preparation: Preparation
- Information about the chemical nature of the cells: \*2

Cell	Material Name	Concentration Range (in %)	CAS No.
Positive electrode	Lithium transition metal oxidate - Li[M] <sub>m</sub> [O] <sub>n</sub> *1	20-60	12190-79-3 12057-17-9 12031-75-3 193214-24-3 346417-97-8
Positive electrode's base	Aluminum	1-10	7429-90-5
Negative electrode	Carbon Graphite	10-30	7440-44-0 7782-42-5
Negative electrode's base	Copper	1-15	7440-50-8
Electrolyte	Organic electrolyte principally involves ester carbonate	5-25	-
Others	Aluminum, Iron	1-30	7429-90-5 7439-89-6

#### INFORMATION ON BATTERY MODEL

The Equivalent Lithium Content derives as an average of the above concentration:

Battery Model	Voltage	Capacity	Energy	Chemistry	Equivalent Lithium Content
A/V 45micro	14,4V	3,0Ah	43,0Wh	Li[M]m[O]n*1	3,6g
A/V MLmicro	14,4V	3,0Ah	43,0Wh	Li[M]m[O]n*1	3,6g
A/V 98micro	14,4V	6,6Ah	95,0Wh	Li[M]m[O]n*1	7,9g
A/V 98	14,4V	6,6Ah	95,0Wh	Li[M]m[O]n*1	7,9g
A/V 150micro	14,4V	9,9Ah	143,0Wh	Li[M]m[O]n*1	11,9g
A/V 150	14,4V	9,9Ah	143,0Wh	Li[M]m[O]n*1	11,9g
A/V 200micro	14,4V	13,2Ah	190,0Wh	Li[M]m[O]n*1	15,8g
A/V 200	14,4V	13,2Ah	190,0Wh	Li[M]m[O]n*1	15,8g
A/V 240micro	14,4V	16,5Ah	238,0Wh	Li[M]m[O]n*1	19,8g
A/V 90RMcine	14,4V	5,9Ah	85,0Wh	Li[M]m[O]n*1	7,0g
A/V 290RMcine	14,4V	19,8Ah	285,0Wh	Li[M]m[O]n*1	23,8g
A/V 155RMcine	14,4V	10,8Ah	156,0Wh	Li[M]m[O]n*1	13,0g
B90cine / B90cineHS / B90cine ML	14,4V	6,0Ah	86,0Wh	Li[M]m[O]n*1	7,2g
B155cine / B155cineML	14,4V	10,8Ah	156,0Wh	Li[M]m[O]n*1	13,0g
B290cine	14,4V	19,8Ah	285,0Wh	Li[M]m[O]n*1	23,8g
B480cine	14,4V	33,0Ah	475,0Wh	Li[M]m[O]n*1	39,6g
Cube 1200	14,4V	79,2Ah	1140,0Wh	Li[M]m[O]n*1	95,0g
Cube 1200 / 700	14,4V	79,2Ah	1140,0Wh	Li[M]m[O]n*1	95,0g
Hot Swap Adapter (ML-120 Series)	14,4V	2,0Ah	28,0Wh	Li[M]m[O]n*1	2,3g

\*1 The letters M and O mean transition metals. Candidates of M and O are: Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.

\*2 Not every product includes all of these materials.

DISCONTINUED PRODUCTS:

Battery Model	Voltage	Capacity	Energy	Chemistry	Equivalent Lithium Content
A/V 75 (+)	14,8V	5,0Ah	75,0Wh	Li[M]m[O]n <sup>*1</sup>	6,0g
A/V 95	14,8V	6,6Ah	95,0Wh	Li[M]m[O]n <sup>*1</sup>	9,0g
A/V 140	14,8V	9,2Ah	140,0Wh	Li[M]m[O]n <sup>*1</sup>	12,0g
A/V 140RL	14,8V	9,0Ah	137,0Wh	Li[M]m[O]n <sup>*1</sup>	12,0g
A/V 160	14,8V	11,0Ah	160,0Wh	Li[M]m[O]n <sup>*1</sup>	15,0g
A/V 190	14,8V	13,0Ah	190,0Wh	Li[M]m[O]n <sup>*1</sup>	18,0g
A/V 200RL	14,4V	13,5Ah	200,0Wh	Li[M]m[O]n <sup>*1</sup>	15,1g
A/V 140C	14,4V	9,6Ah	140,0Wh	Li[M]m[O]n <sup>*1</sup>	11,5g
A/V 90RM	14,8V	6,0Ah	90,0Wh	Li[M]m[O]n <sup>*1</sup>	7,2g
A/V 140RM	14,8V	9,0Ah	140,0Wh	Li[M]m[O]n <sup>*1</sup>	10,8g
A/V 275RM	14,4V	19,0Ah	275,0Wh	Li[M]m[O]n <sup>*1</sup>	23,0g

\*1 The letters M and O mean transition metals. Candidates of M and O are: Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.

\*2 Not every product includes all of these materials.

#### **SECTION 4: First Aid Measures**

The product contains organic electrolyte. In case of electrolyte leakage from the battery, actions described below are required.

Eye contact:	Flush the eyes with plenty of clean water, such as tap water, immediately without rubbing. Seek medical treatment. If appropriate procedures are not taken, loss of sight may result.
Skin contact:	Wash the contacted areas off immediately with plenty of clean water such as tap water, otherwise irritation of the skin may result. If this chemical penetrates the clothing, immediately remove the clothing and flush the skin with water promptly. If irritation persists after washing, seek immediate medical attention.
Inhalation:	Move the exposed person to an area with fresh air immediately and seek medical treatment.
Ingestion:	Seek medical attention immediately

#### **SECTION 5: Firefighting Measures**

Clear fire area of all non-emergency personnel. Clear away any combustible substances from the fire area.

Extinguishing method:	Since vapour generated from burning battery packs causes irritation of the eyes, nose and throat, make sure to extinguish any fire noting the direction of the wind. Wear respiratory protection equipment in when the situation demands.
Fire extinguishing agent:	Plenty of water, CO <sub>2</sub> , and alcohol-resistant foam are recommended.

## **SECTION 6: Accidental Release Measures**

In case of accidental electrolyte leakage, move the battery packs away from the fire immediately. Avoid contact with spilled or released material. Immediately remove any contaminated clothing.

Personal precautions:	Remove any ignition sources nearby. Control any dust generation. You may consider wearing sufficient ventilation/respiratory protection. Prevent any skin and eye contact with the chemical.
Environmental precautions:	Do not dispose of in drains, surface and ground water and soil. Alert the neighbourhood if possible.
Method for cleaning up:	Use of absorbent material (e.g. sand, diatomaceous earth, acid binder, universal binder, sawdust, etc.), reduction of gases/fumes with water dilution.
Note:	Refer to heading 8 for exposure control Refer to heading 13 for disposal consideration

## **SECTION 7: Handling and Storage**

### Handling:

- When packing the battery packs, do not allow terminals to contact each other, or contact with other metals.
- Avoid improper handling of the packaging box, so as not to drop or damage it.
- Do not disassemble or reconstruct, swallow, incinerate or heat the product.
- Avoid use or leave product in the vicinity of fire, stove or heated place.
- Do not immerse the product in water or seawater.
- Dispose of, or recycle the product according to your local government legislation/regulations.

### Storage:

- Batteries should be stored in a stable environment characterized by low-humidity (less than 70%RH), free of corrosive gasses, and an ambient temperature between -20°C and +40°C.
- Do not store the battery packs in places with temperature exceeding 40° or under direct sunlight as this can affect the battery performance.
- Avoid places of high humidity, be sure not to expose the battery pack to condensation or water drops and do not store it in frozen environments.
- To prevent rust, avoid conditions that can create condensation such as rapid fluctuations in the ambient.
- When piling the pallets up or placing them in parallel, appropriate space between each pallet should be allocated.
- Avoid storing the battery pack in places where it can be exposed to static electricity so as not to damage the protection circuit of the battery pack. The battery shall not be stored for long term.
- For a storage a partial charged battery with a State of Charge (SoC) shall be 30% of its rated capacity (a SoC with a minimum of 10% and a maximum of 60% can be handled practically). The battery should be recharged every 4-8 weeks, to keep the battery in full function and e.g. prevent under voltage.
- After storage some self-discharge will occur. Before re-use it is advisable to recharge the battery.
- Be sure to install suitable fire extinguishing equipment, such as automatic fire extinguishers.

## **SECTION 8: Exposure Controls/Personal Protection**

Personal protective equipment:

- Respiratory protection: Respirator with air cylinder, dust mask
- Hand protection: Protective gloves
- Eye protection: Goggles or protective glasses designed to protect against liquid splashes
- Skin and body protection: Working clothes with long sleeve and long trousers

## **SECTION 9: Physical and Chemical Properties**

Appearance:

- Physical state: Solid
- Form: generally prismatic shape, size may vary
- Colour: generally black, but can vary
- Odour: No odour

## **SECTION 10: Stability and Reactivity**

Since batteries function by chemical reaction, they are considered a chemical product.

As such, battery performance will deteriorate over time even if stored for a long period of time without being used.

In addition, the various usage conditions such as charge, discharge, ambient temperature, etc. if not maintained within the specified ranges, may shorten the life expectancy of the battery, or the device in which the battery is used may be damaged by electrolyte leakage.

Stability:

- Stable under normal use.

Hazardous reactions occurring under specific conditions. Conditions to avoid:

- Avoid impact, deconstruction, direct sunlight, high temperature, high humidity, sparks, open flames and other ignition sources

Materials to avoid:

- Conductive materials, water, seawater, strong oxidisers and strong acids.

Hazardous decomposition products:

- Acid or harmful gas is emitted during fire.

## **SECTION 11: Toxicological Information**

- Irritation: Irritation to eyes, skin and throat
- Sensitivity: Sensitivity to skin
- Respiratory irritation: Inhalation of vapours may cause irritation to the respiratory system

## **SECTION 12: Ecological Information**

Since a battery and the internal materials remain in the environment, do not bury or dispose into the environment.

**SECTION 13: Disposal Considerations**

When the battery is worn out, dispose of it under the ordinance of the local authorities or the law imposed by the relative government.

**SECTION 14: Transport Information**

During the transportation of a large amount of battery packs by sea, air, trailer, or railway, do not leave these in a location of high temperature and do not allow them to be exposed to condensation. Confirm there is no leakage or spillage from the container. Properly store cargo to prevent falling, dropping and breakage. Prevent collapse of cargo piles and exposure to rain. The container must be handled carefully. Do not give shocks that result in dents on the product. Please also refer to Section 7-HANDLING AND STORAGE

UN regulation

UN Classification:	UN3480 (stand alone battery pack) UN3481 (contained in equipment or packed with equipment)
Proper shipping name:	Lithium ion batteries Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment
Class:	9 – Miscellaneous Dangerous Goods

Regulation depends on region and transportation mode:

Worldwide, air transportation:

- IATA-DGR: packing instruction 965, when capacity is below 100Wh and other conditions are met.
- IATA-DGR: packing instruction 965 Section IB, when capacity is below 100Wh and other conditions are met.
- IATA-DGR: packing instruction 965 Section IA, when capacity is over 100Wh.
- When batteries are packaged with equipment or contained in equipment, refer to packing instruction 966 or 967 instead of 965.)

Worldwide, sea transportation:

- IMO-IMDG Code [special provision 188]

Europe, road transportation:

- ADR [special provision 188]

**SECTION 15: Regulatory information**

- UN (United Nations): Recommendations on the Transportation of Dangerous Goods Model Regulations
- ICAO (International Civil Aviation Organisation): Technical Instructions for the safety transport of dangerous goods by air.
- IATA (International Air Transport Organisation): Dangerous Goods Regulations 65th Edition
- IMO (International Maritime Organisation): International Maritime Dangerous Goods (IMDG) Code

**SECTION 16: Other information**

The information contained in this Safety Data Sheet is based on the present state of knowledge and current legislation. This Safety Data Sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.