

## Material Safety Data Sheet (MSDS)

### 1. Product and Company Identification

Name of Product:	Lithium-Ion battery pack
Model:	All models listed in the below table
Name of company:	GENTREE
Address:	Bucheon-Technopark 403dong, 803ho, Yakdaedong, Wonmigu, Bucheonsi, Gyeonggido, Korea Zip : 14502
Telephone number:	+82-32-556-8940
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Emergency Contact:	+82-32-556-8940

### 2. Composition of the goods

Battery Model	Voltage	Capacity	Wh	Chemistry	Equivalent Lithium Content
G-B50/98W	14.4V	6.8Ah	98Wh	Lithium Ion	8.16g
G-B50/145W	14.4V	10.2Ah	145Wh	Lithium Ion	12.2g
G-B100/98W	14.4V	6.8Ah	98Wh	Lithium Ion	8.16g
G-B100/160W	14.4V	11Ah	160Wh	Lithium Ion	13.2g
G-B100/195W	14.4V	13.5Ah	195Wh	Lithium Ion	16.2g
G-B100/290W	14.4V	20Ah	290Wh	Lithium Ion	24g
G-B100/390W	14.4V	27Ah	390Wh	Lithium Ion	32.6g

UN Classification:	UN3480 (standalone battery pack) UN3481 (contained in equipment or packed with equipment)
Class:	9 – Miscellaneous Dangerous Goods

### 3. Summary of Hazards

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.

### 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

### 5. Fire-fighting 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.

## **6. Measures for electrolyte leakage**

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

## **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 :**

- Do not store the battery packs in places with temperature exceeding 35° or under direct sunlight as this can affect the battery performance.
- Avoid places of high humidity and be sure not to expose the battery pack to condensation or water drops and do not store it in frozen environments.
- When piling the pallets up or placing them in parallel, appropriate space between each pallet should be allocated.
- Be sure to install suitable fire extinguishing equipment, such as automatic fire extinguishers.
- 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.

## **8. Exposure controls (in case of electrolyte leakage from the battery)**

### **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

## 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

## 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 :

- Acrid or harmful gas is emitted during fire

## 11. Toxicological information (in case of electrolyte leakage from the battery)

### Irritation :

- Irritation to eyes, skin and throat

### Sensitivity :

- Sensitivity to skin

### Respiratory irritation :

- Inhalation of vapours may cause irritation to the respiratory system

## 12. Ecological information

Since a battery cell and the internal materials remain in the environment, do not bury or dispose into the environment. Heavy metal in battery : Mercury(Hg) and Cadmium(Cd) are neither contained nor used in batteries.

## 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.

#### 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 (standalone 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
Packing group:	II
UN requirements:	Each battery pack is of the type proved to meet the requirements of each test in the UN Manual of Tests and Criteria, Part, sub-section 38.3

Regulation depends on region and transportation mode

##### Worldwide, air transportation :

- IATA-DGR: packing instruction 965 Section II, 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]

#### 15. Regulatory information

- UN (United Nations) : Recommendations on the Transportation of Dangerous Goods Model Regulations
- ICAO (International Civil Aviation Organization) : Technical Instructions for the safety transport of dangerous goods by air.
- IATA (International Air Transport Association) : Dangerous Goods Regulations 59th Edition
- IMO (International Maritime Organization) : International Maritime Dangerous Goods (IMDG) Code

#### 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.