

# Material Safety Data Sheets (MSDS)

## 1. PRODUCT AND COMPANY IDENTIFICATION

Product: Flex BRANDED LITHIUM-ION BATTERY PACKS

Model Number: 5173 18V5S2P, 5172 18V5SP

Manufacturer: Nanjing Chervon Industry Co., Ltd.

Address: 159 South Jiang-jun Rd. Jiangning Economic & Technical Development Zone

Nanjing, Jiangsu 211106 P. R. China

Phone: 0086-25-52786666

Note: Batteries may be shipped in kits with the products they are intended to power.

## 2. HAZARDS IDENTIFICATION

- Emergency overview:

Not considered dangerous as manufactured. If battery is damaged, exposure to product components may cause eye, skin and respiratory tract irritation.

Combustion products from a fire involving batteries may be harmful.

- Potential health effects:

a. Eyes: none anticipated under normal product use and handling conditions.

If battery is damaged, exposure may cause severe irritation or burns.

b. Skin: none anticipated under normal product use and handling conditions.

If battery is damaged, exposure may cause severe irritation or burns.

c. Ingestion:

Not considered a likely route of exposure under normal product use and handling conditions. Ingestion of material from a damaged battery may cause serious burns to mouth, esophagus, and gastrointestinal tract.

d. Inhalation: none anticipated under normal product use and handling conditions.

If battery is damaged, exposure to vapors or mist may cause respiratory irritation.

### HMIS RATINGS:

HEALTH 0

FIRE 0

HMIS REACTIVITY 0

### HAZARD SCALE:

0 = MINIMAL

1 = SLIGHT

2 = MODERATE

3 = SERIOUS

4 = SEVERE

\* = CHRONIC HAZARD

## 3. COMPOSITION/ INFORMATION ON INGREDIENTS

The battery pack contains different quantity battery cells in it depending on the battery pack capacity.

Battery Pack Model Number	Quantity of the Battery Cells
5172 18V5SP	5
5173 18V5S2P	10

The Information about the chemical nature of the product for one battery cell:

CAS-No.	Chemical name	Quantity
<b>1307-96-6</b>	Cobalt oxide	< 30 %
1313-13-9	Manganese dioxide	< 30 %
1313-99-1	Nickel oxide	< 30 %
7440-44-0	Carbon	< 30 %
	Electrolyte (*)	< 20 %
24937-79-9	Polyvinylidene fluoride (PVdF)	< 10 %
7429-90-5	Aluminium foil	2 - 10 %
7440-50-8	Copper foil	2 - 10 %
	Aluminium and inert materials	5 - 10 %

Notes:

- Not every product includes all of these materials.
- The letter M means transition metal and candidates of M 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.

#### 4. FIRST-AID MEASURES

- Eyes: flush eyes with lukewarm water for at least 30 minutes while holding the eyelids open. Seek immediate medical care.
- Skin: remove contaminated clothing, shoes and leather goods. Flush with water for at least 30 minutes. Seek medical attention if symptoms persist.
- Ingestion: never give anything by mouth if victim is unconscious. Rinse mouth thoroughly with water. Do not induce vomiting. Seek immediate medical attention.
- Inhalation: remove person to fresh air away from source of contamination.

#### 5. FIRE-FIGHTING MEASURE

- General fire hazards: see section 9 for flammability properties. Battery cells may rupture when exposed to excessive heat. Electrolyte solution is flammable.
- Hazardous combustion products: may release toxic fumes if burned or exposed to fire.
- Extinguishing media:

Use appropriate extinguishing agent for surrounding fire. For damaged or ruptured cells, use class D extinguisher or other appropriate agent. Class C fire extinguishers should be used to extinguish electrical fires. Do not use water to extinguish electrical or ruptured cell related fires.

- Fire fighting equipment/instructions: firefighters should wear full protective gear.

**NFPA RATINGS:**

HEALTH 0

FIRE 0

REACTIVITY 0

**HAZARD SCALE:**

0 = MINIMAL

1 = SLIGHT

2 = MODERATE

3 = SERIOUS

4 = SEVERE

**6. ACCIDENTAL RELEASE MEASURES**

- Containment procedures: stop the flow of material, if this is without risk.
- Clean-up procedures:  
absorb spill with inert material. Shovel material into appropriate container for disposal. Clean spill area with detergent and water; collect wash water for proper disposal.
- Evacuation procedures: isolate area. Keep unnecessary personnel away.
- Special procedures: avoid skin contact with the spilled material.

**7. HANDLING AND STORAGE**

- Handling procedures:
  - a. Avoid damaging or rupturing battery.
  - b. Keep the battery away from heat and fire.
  - c. Do not disassemble or reconstruct the battery.
- Storage procedures:  
Store in a dry location at room temperature. Avoid extreme heat or fire. Keep out of reach of children.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

- Component exposure limits: ACGIH, OSHA and NIOSH have not developed exposure limits for any of this product's components.
- Engineering controls: not necessary under normal product use conditions.
- Personal protective equipment:
  - a. Eyes/face:  
not necessary under normal product use conditions. Wear safety glasses if handling a damaged battery.

- b. Skin:  
not necessary under normal product use conditions. Wear neoprene or natural rubber gloves when handling a damaged battery.
- c. Respiratory: not necessary under normal product use conditions.
- d. General: eyewash fountains and emergency showers are required

#### 9. **PHYSICAL & CHEMICAL PROPERTIES**

- Appearance: various shaped battery
- Odor: none
- Physical state: solid
- Ph: na
- Vapor pressure: na
- Vapor density: na
- Boiling point: na
- Melting point: na
- Solubility (h<sub>2</sub>o): insoluble
- Specific gravity: na
- Evaporation rate: na
- Voc: na
- Octanol /h<sub>2</sub>o coeff.: na
- Flash point: na
- Flash point method: na
- Upper flammability limit (ufl): na
- Lower flammability limit (lfl): na
- Burning rate: na
- Auto ignition: na

#### 10. **CHEMICAL STABILITY & REACTIVITY INFORMATION**

- Chemical stability: The battery is stable under normal use.
- Conditions to avoid: avoid exposure to elevated temperatures and fire.
- Incompatibility: not available.
- Hazardous decomposition: may release toxic fumes if burned or exposed to fire.
- Possibility of hazardous reactions: not available.

#### 11. **TOXICOLOGICAL INFORMATION**

- Acute dose effects:
  - a. General product information:  
If product is ruptured, material may cause irritation to the skin, eyes and respiratory tract.
  - b. Component analysis -LD<sub>50</sub>/LC<sub>50</sub>:  
No LD<sub>50</sub>/LC<sub>50</sub>'s are available for this product's components.
- Carcinogenicity:
  - a. General product information: no information available for the product.
  - b. Component carcinogenicity: none of this product's components are listed by

ACGIH, IARC, OSHA, NIOSH or NTP.

## 12. ECOLOGICAL INFORMATION

- Ecotoxicity:
  - a. General product information: no information available for the product.
  - b. Component analysis - ecotoxicity - aquatic toxicity:  
no ecotoxicity data are available for this product's components.

## 13. DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal:
  - a. Product (waste from residues)

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

- b. Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

## 14. TRANSPORTATION INFORMATION

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B (2013-2014 Edition), - The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section I B (55th Edition, 2014)

- The International Maritime Dangerous Goods (IMDG) Code (2012 Edition),
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations)

Sections 173-185 Lithium batterie and cells,

- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Rev.5, Amend.1

- UN No. 3480

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria.

### Test results of the UN Recommendation on the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)		Test Results	Remark
No	Test item		
T1	Altitude Simulation	Pass	
T2	Thermal Test	Pass	
T3	Vibration	Pass	

T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact	Pass	
T7	Overcharge	Pass	For pack and single cell battery only
T8	Forced Discharge	Pass	

## 15. REGULATORY INFORMATION

### Regulatory information EU

#### Labeling

#### Hazardous components which must be listed on the label

As an article the product does not need to be labeled in accordance with EC directives or respective national laws.

#### EU regulatory information

1999/13/EC (VOC):

0 %

## 16. OTHER INFORMATION

### Hazardous Materials Information Label (HMIS)

Health: 0

Flammability: 0

Physical Hazard: 0

#### NFPA Hazard Ratings

Health: 0

Flammability: 0

Reactivity: 0

Unique Hazard:

#### Full text of R-phrases referred to under sections 2 and 3

R10 Flammable.

R20/22 Harmful by inhalation and if swallowed.

R22 Harmful if swallowed.

R34 Causes burns.

R40 Limited evidence of a carcinogenic effect.

R43 May cause sensitization by skin contact.

R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R49 May cause cancer by inhalation.

R50 Very toxic to aquatic organisms.

R53 May cause long-term adverse effects in the aquatic environment.

#### Further Information

Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product

(s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations.

"(n.a. = not applicable; n.d. = not determined)"

The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.

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End