

SAFETY DATA SHEET

DLG POWER BATTERY CONFIDENTIAL PROPRIETARY

Revision Number : 0

1. Identification

Product: Rechargeable Lithium-ion Cylindrical Battery

Manufacturer: DLG Power Battery (Shanghai) Co., Ltd.

Address: No.3492 Jinqian Road, Qingcun Town, Fengxian District, Shanghai, China

Tel: 021-57474368

Fax: 021-57474370

Web site: www.dlgbattery.cn

2. HAZARDS IDENTIFICATION

Classification:

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

No specific health hazards for normal use.

Routes of Entry

There is no hazard when the measures for handling and storage are followed.

Health Hazards

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is acute exposure when a battery vents. Leaking material exposure to skin, eyes may cause irritation. Inhalation of fumes may cause respiratory irritation.

Sign/Symptoms of Exposure

Leaking can cause thermal and chemical burns upon contact with the skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Composition	Chemical Formula	CAS No.	Weight(%)
Cobalt lithium manganese nickel oxide	LiNixCoyMn1-x - yO2	182442-95-1	30-45w/w
Graphite	C	7782-42-5	15-25 w/w
Lithium hexafluorophosphate	LiPF ₆	21324-40-3	1-3 w/w
Poly (vinylidene fluoride) (PVDF)	(C ₂ H ₂ F ₂) _n	24937-79-9	0.1 -4 w/w
Aluminum foil	Al	7429-90-5	2-8 w/w
Copper foil	Cu	7440-50-8	5 -10 w/w
Carbon black and others	C	1333-86-4	0.5-3w/w
Styrene, 1,3-butadiene polymer	(C ₁₂ H ₁₄) _n	9003-55-8	0.5-5 w/w
Carboxymethylcellulose sodium	R(N)OCH ₂ COONA	9004-32-4	0.5-2 w/w

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 the eternal battery casing. Undamaged,closed, cells do not represent a danger to the health.

Eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

Inhalation

Remove from exposure and move to fresh air immediately. Use oxygen if available.

Ingestion

Do not induce vomiting. Call a physician immediately.

5. FIRE-FIGHTING MEASURES

Flash Point: N/A.

Auto-Ignition Temperature: N/A.

Suitable extinguishing Media

Cold water and dry powder in large amount are applicable. Use metal fire extinction power or dry sand if only few cells are involved.

Special hazards arising form the chemical

May form hydrofluoric acid if electrolyte comes into contact with water. In case of fire, the formation of the following flue gases can not be excluded: Hydrogen fluoride(HF), Carbon monoxide and carbon dioxide.

Protective equipment and precautions for firefighters

Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up/taking up.

Take up mechanically and send for disposal.

7. HANDLING AND STORAGE

Handling

Advice on safe handling

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage rooms and vessels

Storage at room temperature(approx.20°C) at approx.20~60% of the nominal capacity(OCV approx.3.6~3.9V/cell).

Keep in closed original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Additional advice on limit values

During normal charging and discharging there is no release of product.

Occupational exposure controls

No specific precaution necessary.

Protective and hygiene measures

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

Respiratory Protection

No specific precautions necessary.

Hand protection

No specific precautions necessary.

Eye protection

No specific precautions necessary.

Skin protection

No specific precautions necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Ingredient	Risk Code	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt lithium manganese nickel oxide	R22;R43;R50/53	S24;S37;S60;S61	Xn(Harmful) N(Dangerous for the environment)	0.1mg / m3(TWA)
Poly (vinylidene fluoride) (PVDF)		S22;S24 / 25		
Aluminum foil	R17,R15,R36 / 38,R10 ,R67,R65, R62,R51 / 53,R48 / 20	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 Limits(PELs): 15mg / m3(TWA) total dust and 5mg / m3(TWA)
Copper foil	R11 , R36, R37,R38	S5,S26,S16,S61,S36 / 37	F(Highly Flammable) N(Dangerous for Environment) Xn(harmful) Xi(Irritant)	Cooper Dust and Mists, as Cu: -OSHA Permissible Exposure Limit(PEL)-1mg / m3(TWA) Cooper Fume: -OSHA Permissible Exposure Limit(PEL)- 0.1mg / m3(TWA)
Carbon black and others	S22;S24 / 25		F(Highly Flammable)	Airborne Exposure Limits: -OSHA Permissible Exposure Limits(PELs):total particulate 15mg / m3

Appearance

Form: Solid

Color: Various

Odor: Odorless

Important health,safety and environmental information

Test method

pHValue	n.a.
Flash point	n.a.
Lower explosion limits	n.a.
Vapour pressure	n.a.
Density	n.a.
Water solubility	Insoluble
Ignition temperature	n.a.

10. STABILITY AND REACTIVITY**Stability**

Stable.

Conditions to Avoid

Heating over 90°C , fire, mechanical abuse and electrical abuse.

Incompatible materials

No materials to be especially mentioned.

Hazardous Decomposition Products

In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.

Possibility of Hazardous Reactions

Will not occur

11. TOXICOLOGICAL INFORMATION

Empirical data on effects on humans

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

12. ECOLOGICAL INFORMATION

Further information

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

13. DISPOSAL CONSIDERATIONS

Appropriate Method of Disposal of Substance or Preparation

Dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental agency.

Contaminated packaging

Disposal in accordance with local regulations.

14. TRANSPORT INFORMATION

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

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section II (2013-2014 Edition)
- The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section II (54th Edition, 2013)
- US Hazardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173-185 Lithium batteries and cells
- The UN Recommendations on the Transport of Dangerous Goods, The battery can be treated as non-dangerous goods according to Special Provision 188.
- UN No. 3840

15. REGULATORY INFORMATION

U.S. Regulations

National Inventory TSCA

All of the components are listed on the TSCA inventory.

SARA

To the best of our knowledge this product contains no toxic chemicals subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA/EPCRA) and the requirements of 40 CFR Part 372.

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

Further Information

Data of section 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 no 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 form the last version of the sub-contractor’s safety data sheet.

R10	Flammable
R20/22	Harmful by inhalation and if swallowed
R22	Harmful if swallowed
R34	Cause burn
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 case cancer by inhalation
R50	Very toxic to aquatic organisms
R53	May cause long-term adverse effects in the aquatic environment