SAFETY DATA SHEET

Section 1. Chemical Produc	ct and Company Identification
Products Name	Lithium-ion Battery
Mode/Type reference	NBP2 18V 9.0Ah 162Wh
Nominal Voltage	18V
Typical Capacity	9.0Ah
Typical Power	162Wh
Manufacture Name	Zhejiang VALUE Mechanical & Electrical Products CO.,LTD
Address	jiulong Avenue, Western Industrial District, Wenling, Zhejiang, China
Postcode	317500
Emergency Telephone No.	0576-86992913
Technical Support Telephone No.	0576-86992919
Fax	0576-86992919
E-mail	tong.haoqi@worldvalue.cn
SDS Code	VALUE-SDS003
Date Prepared	2019-12-16

Section 2. Hazards Identification

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) this product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.

Skin corrosion/irritation	Category 4
Serious eye damage/eye	Category4
Skin sensitization	Category3
Carcinogenicity	Category5
Specific target organ toxicity (repeated exposure)	Category3

GHS Label elements, including precautionary statements Emergency Overview

Signal word: Danger **Hazard Statements** Causes skin irritation

Causes serious eye irritation

May cause an allergic skin reaction

May cause cancer







This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold.

Intended use of the product should not result in exposure to the chemical substance This is a battery. In case of rupture: the above hazards exist.

Appearance Gray	Physical State Solid	Odor Odorless		
	Obtain special instructions before use			
	Do not handle until all safety precautions have been	read and understood		
Precautionary	Use personal protective equipment as required			
Statements -	Wash face, hands and any exposed skin thoroughly	after handling		
Prevention	Contaminated work clothing should not be allowed c	out of the workplace		
Frevention	Wear protective gloves			
	Do not breathe dust/fume/gas/mist/vapors/spray			
	Do not eat, drink or smoke when using this product			
	IF exposed or concerned: Get medical advice/attent	ion		
	Specific treatment (see supplemental first aid instruc	ctions on this label)		
Precautionary	IF IN EYES: Rinse cautiously with water for several	minutes. Remove contact		
Statements -	lenses, if present and easy to do. Continue rinsing If	eye irritation persists: Get		
Response	medical advice/attention			
Response	IF ON SKIN: Wash with plenty of soap and water			
	Take off contaminated clothing and wash before reu	se		
	If skin irritation or rash occurs: Get medical advice/a	ttention		
Precautionary	Store locked up			
Statements -				
Storage				
Precautionary				
Statements -	Dispose of contents/container to an approved waste disposal plant			
Disposal				
Hazards not				
otherwise	Not applicable			
classified	That applicable			
(HNOC)				
Unknown	_			
Toxicity				
Other	May be harmful if swallowed Very toxic to aquatic life	e with long lasting effects		
information	Repeated or prolonged skin contact may cause aller	gic reactions with susceptible		
	persons			
Interactions				
with Other	No information available.			
Chemicals				

Section 3. Composition/Information on Ingredients

Chemical Name	CAS Number	Weight-%	Trade Secret
	12190-79-3		
Lithium transition metal oxidate	12057-17-9	20~60%	
	182442-95-1		
Aluminium	7429-90-5	1~10 %	
Carbon	7782-42-5	10~30 %	
Carbon	7440-44-0		
Copper	7440-50-8	1~15%	
Organic electrolyte principally		5%~25%	
involves ester carbonate			
Iron	7439-89-6	1~30%	

^(*) Main ingredients: Lithium hexafluorophosphate, organic carbonates.

Section 4. First	Aid Measures		
	First aid is upon rupture of sealed battery.		
	Eye contact: If symptoms persist, call a physician. Rinse immediately with plenty of		
	water, also under the eyelids, for at least 15 minutes. Keep eye wide open while		
	rinsing. Remove contact lenses, if present and easy to do.		
	Continue rinsing. Do not rub affected area.		
	Skin contact: Wash off immediately with soap and plenty of water for at least 15		
	minutes. In the case of skin irritation or allergic reactions see a physician. May cause		
General Advice	an allergic skin reaction.		
General Advice	Inhalation: Remove to fresh air. If symptoms persist, call a physician. Get medical		
	attention immediately if symptoms occur.		
	Ingestion: Do NOT induce vomiting. Rinse mouth immediately and drink plenty of		
	water. Never give anything by mouth to an unconscious person.		
	Call a physician.		
	Self-protection of the first aider: Avoid contact with skin, eyes or clothing. Use		
	personal protective equipment as required. Wear personal protective		
	clothing (see section 8).		
Most important			
symptoms and	Most important symptoms and effects: Itching. Coughing and/ or wheezing.		
effects, both acute	meet impertant eymptome and enected iteming. easigning and, or misseling.		
and delayed			
Indication of any	Notes to Physician: Treat symptomatically. May cause sensitization of susceptible		
immediate medical	persons.		
attention and	F		
special treatment			

Section 5. Fire Fighting Measures

needed

Suitable	Use extinguishing measures that are appropriate to local circumstances and the		
extinguishing Media	surrounding environment.		
Unsuitable CAUTION: Use of water spray when fighting fire may be inefficient.			

^{*} The exact percentage (concentration) of composition has been withheld as a trade secret.

Extinguishing Media	
Specific Hazards	
arising from the	Product is or contains a sensitizer. May cause sensitization by skin contact.
chemical	
Hazardous	
Combustion	Carbon oxides.
Products	
Foundation Date	Sensitivity to Mechanical Impact: No.
Explosion Data	Sensitivity to Static Discharge: No.
Protective	
Equipment	As in any fire, wear self-contained breathing apparatus pressure-demand,
and precautions for	MSHA/NIOSH (approved or equivalent) and full protective gear.
firefighters	

Section 6. Accidental Release Measures

Personal Precautions,	Personal Precautions: Avoid contact with skin, eyes or clothing. Ensure adequate		
protective equipment,	ventilation. Use personal protective equipment as required. Evacuate personnel to		
and emergency	safe areas.		
procedures	Other Information: Refer to protective measures listed in Sections 7 and 8.		
Environmental	Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or		
Precautions	spillage if safe to do so.		
Methods and material for containment and cleaning up	Methods for Containment: Prevent further leakage or spillage if safe to do so. Methods for cleaning up: Pick up and transfer to properly labeled containers.		

Section 7 – Handling and Storage

Precautions for safe handling	Handling: In case of rupture. Use personal protection equipment. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Do not breathe dust/fume/gas/mist/vapors/spray. Storage: Keep containers tightly closed in a dry, cool and well-ventilated place. Incompatible Products: Strong acids. Strong oxidizing agents. Strong bases.	
Conditions for safe storage, including any		
incompatibilities		

Section 8. Exposure Controls/Personal Protection

Control parameters

Exposure Guidelines

Expos Guideli		ACGIH TLV	OSHA PEL	NIOSH IDLH
Lithium	Cobalt			
Oxide		TWA: 0.02 mg/m ³		
(CoLiO2)		TWA. 0.02 mg/m		
12190-79-3				
		TWA:0.2mg/m³	TWA:0.1mg/m³ fume	IDLH:100mg/m ³ dust,fume
Copper		fume	TWA:1mg/m³ dust and mist	and mist
7440-50-8		TWA:1mg/m³ Cu	(vacated) TWA:0.1g/m³ Cu	TWA:1 mg/m³dust and mist
		dust and mist	dust,fume,mist	TWA: 0.1 mg/m ³ fume

		TWA:15mg/m³ total dust	
Aluminum	TWA:1mg/m³	TWA:5mg/m³ respirable fraction(vacated)	TWA:10 mg/m³ total dust
7429-90-5	respirale frcation	TWA:15mg/m³ total dust(vacated)	TWA:5mg/m ³ respirable
7429-90-3	respirate freation	TWA:5mg/m³ respirable fraction(vacated)	dust
		TWA:5mg/m³ AL Aluminum	
	TWA:2mg/m ³	TWA:15mg/m³ total dust synthetic	
Graphite Respirable fraction 7782-42-5 all forms except	TWA:5mg/m³ respirable fraction synthetic	IDLH:1250 mg/m ³	
	TWA:2.5mg/m ³ respirable dust	TWA:2.5 mg/m³ respirable	
7702-42-3	graphite fibers	natural(vacated) TWA:10mg/m³ total dust	dust
		synthtic	

*ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits NIOSH IDLH Immediately Dangerous to Life or Health

Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992) See section 15 for national exposure control parameters

Engineering Controls	Keep away from heat and open flame.	
Ventilation	Not necessary under conditions of normal use. In case of abuse, use adequate mechanical ventilation (local exhaust) for the battery that vent gas or fumes.	
Respiratory Protection	Not necessary under conditions of normal use. If battery is burning, leave the area immediately. During fire fighting fireman should use self-contained breathing, full-face respiratory equipment. Fires may be fought but only from safe fire fighting distance, evacuate all persons from the area of fire immediately.	
Eye Protection	Not necessary under conditions of normal use. Use safety glasses with side shields if handling a leaking or ruptured battery.	
Body Protection	Not necessary under conditions of normal use. Use rubber apron and protective working in case of handling a leaking of ruptured battery.	
Protective Gloves	Not necessary under conditions of normal use. Use chemical resistant rubber gloves if handling a leaking or ruptured battery.	
Others Use good chemical hygiene practice. Wash hands thoroughly after cleaning-battery spill caused by leaking battery. No eating, drinking, or smoking in bastorage area.		

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

State	No data available
Colour	No data available
Odor	No data available
Odor Threshold	No data available
рН	No data available
Melting / freezing point	No data available
Boiling point / boiling range	No data available
Flash Point	No data available

- Francis	tion Data		No data available	
<u> </u>	tion Rate	\		
Flammability (solid, gas)			No data available	
Explosion Limits(vol% in air)		n air)	No data available	
	oressure		No data available	
•	density		No data available	
	Gravity		No data available	
	Solubility		No data available	
Solubility in o			No data available	
Partition coefficie			0.0001	
Autoignition	temperatu	ıre	130℃	
Decomposition	n tempera	ture	No data available	
Kinemati	c viscosity		No data available	
	viscosity		0.0001	
Explosive	properties	S	No data available	
Oxidizing	Properties	S	No data available	
Other Information				
Softeni	ng Point		No data available	
VOC Co	ntent (%)		No data available	
Partic	le Size		No data available	
Particle Size	e Distributi	on	No data available	
Section 10. Sta	bility a	and React	tivity	
Stability	Stable			
Conditions to Avoid	Do not he	eat, throw into	fire, disassemble, short circuit, immerse in water or overcharge, etc.	
Incompatibility	None during normal operation. Avoid exposure heat, open flame and corrosives.			
Hazardous	Hazardous polymerization does not occur.			
Polymerization				
Hazardous Decomposition Products	The battery may release irritative gas once the electrolyte leakage.			
Section 11. To	xicolog	ical Infor	rmation	
Information on likely	routes of	exposure		
Due dont lafarer	tion	Product does	s not present an acute toxicity hazard based on known or	
Product Informa	tion	supplied information. In case of rupture:.		
Specific test data for the substance or mixture is not available. May caus irritation of respiratory tract.			•	
			ophatory adot.	

Specific test data for the substance or mixture is not available. Expected to be

Specific test data for the substance or mixture is not available. Expected to be

an irritant based on components. Irritating to skin. Prolonged contact may

an irritant based on components. Irritating to eyes. May cause redness,

itching, and pain. May cause temporary eye irritation.

Eye Contact

Skin Contact

	cause redness and irritation.
Ingestion	Specific test data for the substance or mixture is not available. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Component Information	
Information on toxicological	Symptoms: Erythema (skin redness). May cause redness and tearing of the
effects	eyes. Itching. Rashes. Hives.
Delayed and immediate effects as well as chronic effects from short and long-term exposure	Sensitization: May cause sensitization of susceptible persons. May cause sensitization by skin contact. Mutagenic Effects: No information available. Carcinogenicity: The table below indicates whether each agency has listed any ingredient as a carcinogen

Chemical Name	ACGIH	IARC	NTP	OSHA
Lithium Cobalt				
Oxide (CoLiO2)	A3	Group 2B		X
12190-79-3				

ACGIH (American Conference of Governmental Industrial Hygienists)

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

Group 3 - Not Classifiable as to Carcinogenicity in Humans

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X – Present

Reproductive Toxicity	No information available.
STOT - single exposure	No information available.
STOT – repeated exposure	Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).
Chronic Toxicity	Contains a known or suspected carcinogen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse liver effects.
Target Organ Effects	Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Central Vascular System (CVS).Kidney. Liver. Lungs. Heart.
Aspiration Hazard	No information available.
Numerical management of toxicity	Due don't la farmantia a

Numerical measures of toxicity Product Information

The values which are on the	
right are calculated based on	ATEmix (oral)
chapter 3.1 of the GHS	ATEmix (dermal)
document.	ATEmix (inhalation-dust/mist)

Section 12. Ecological Information

Ecotoxicity

Very toxic to aquatic life with long lasting effects

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to	Daphnia Magna
			Microorganisms	(Water flea)
Copper	96h EC50: 0.031 - 0.054	96h LC50: 0.0068 - 0.0156		48h EC50: = 0.03 mg/L
7440-50-8	mg/L (Pseudokirchneriella	mg/L (Pimephales promelas)		
	subcapitata) 72h EC50:	96h LC50: = 0.112 mg/L(Poecilia reticulata)		
	0.0426 - 0.0535 mg/L	96hLC50: = 0.3 mg/L (Cyprinus carpio)		
	(Pseudokirchneriella	96h LC50: = 0.8mg/L (Cyprinus carpio)		
	subcapitata)	96h LC50: = 1.25 mg/L(Lepomis macrochirus)		
		96h LC50: =0.052 mg/L (Oncorhynchus		
		mykiss)		
		96h LC50: = 0.2mg/L (Pimephales promelas)		
		96h LC50: < 0.3 mg/L (Pimephales promelas)		

Persistence and Degradability	No information available.	
Bioaccumulation	No information available	
Other adverse effects	No information available	

Section 13. Disposal Considerations

Waste treatment methods

Disposal methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging: Dispose of in accordance with federal, state and local regulations.

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste

Chemical Name	California Hazardous Waste
Lithium Cobalt Oxide (CoLiO2)	Toxic
12190-79-3	
Copper	Toxic
7440-50-8	
Aluminum	Ignitable powder
7429-90-5	

Section 14. Transport Information

The Li-lon battery as stated in Appendix are made in compliance to the requirements stated in the latest edition of the IATA Dangerous Goods Regulations Packing Instruction 965 section II such that they can be transported as a NOT RESTRICTED (non-hazardous/non-dangerous) goods. However, if those Li-lon batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods

Regulations section II of either Packing Instruction 966 or 967.

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

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing instruction 965 or 967, section II (2019 Edition).
- The International Air transport Association (IATA) Dangerous Goods Regulations, Packing instruction 965 or 966 or 967, section II (60th Edition, 2019).
- Special provision 188 of the International Maritime Dangerous Goods (IMDG) Code (Amendment 38-16 Edition).
- The US Hazardous Materials Regulation 49 CRF (Code of Federal Regulations), sections 173-185 Lithium batteries and cells.
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Rev.6.

These 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 Tests and Criteria.

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

Manua	Manual of Test and Criteria (38.3 Lithium battery)			
No.	Test items	Test results	Remark	
T1	Altitude simulation	Pass		
T2	Thermal test	Pass		
T3	Vibration	Pass		
T4	Shock	Pass		
T5	External short circuit	Pass		
T6	Impact / Crush	Pass		
T7	Overcharge	Pass		
T8	Forced discharge	Pass		

Additional Requirements for air transport:

- 1. Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- 2. Cells and batteries must be manufactured under a quality management program.
- 3. The Watt-hour rating must be marked on the outside of the battery case except those manufactured before 1 January 2009.
- 4. Cells and batteries must be packed in strong outer packagings. (applicable to PI 965 only)
- 5. Maximum number of cells per package must not be more than 8 cells. (applicable to PI 965 only)
- 6. Cells and batteries must be packed in inner packagings that completely enclose the cell or battery. To provide protection from damage or compression to the batteries, the inner packagings must be placed in a strong rigid outer packaging of one of the packaging types shown below.
- 7. Each package must be capable of withstanding a 1.2 m drop test in any orientation without (applicable to PI 965 only):
- damage to cells or batteries contained therein;
- shifting of the contents so as to allow battery to battery (or cell to cell) contact;
- release of contents.
- 8. Each consignment must be accompanied with a document with an indication that:
- the package contains lithium ion cells or batteries;

- the package must be handled with care and that a flammability hazard exists if the package is damaged;
- special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and a telephone number for additional information.
- 9. Each package must be labelled with a lithium battery handling label (Figure 7.4.H).
- 10. A Shipper's Declaration for Dangerous Goods is not required.
- 11. The words "Lithium ion batteries in compliance with Section II of PI 965" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and

Quantity of Goods" box of the air waybill. (applicable to PI 965 only)

- 12. Any person preparing or offering cells for transport must receive adequate instruction on these requirements commensurate with their responsibilities.
- 13. The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation. (applicable to PI 966 only)
- 14. The maximum number of batteries in each package must be the minimum number required to power the equipment plus two spares. (applicable to PI 966 only)
- 15. The words "Lithium ion batteries in compliance with Section II of PI 966" must be included on the air waybill, when an air waybill is used. The information should be shown in the "Nature and Quantity of Goods" box of the air waybill. (applicable to PI 966 only).

Section 15. Regulatory Information

Law Information

《California Proposition 65》

《Canadian Domestic Substances List/Non-Domestic Substances List》 (DSL/NDSL)

《Classification and code of dangerous goods》

《Code of Federal Regulations》 (CFR)

《Consumer Product Safety Act》(CPSA)

《Dangerous Goods Regulation 56th Editon》

《Federal Environmental Pollution Control Act》 (FEPCA)

《International Maritime Dangerous Goods 38-16 Editon》

《Occupational Safety and Health Act》 (OSHA)

《Recommendations on Transport of Dangerous Goods Model Regulations》

《Resource Conservation and Recovery Act》 (RCRA)

《Safety Drinking Water Act》 (CWA)

《Superfund Amendments and Reauthorization Act III(302/311/312/313)》 (SARA)

《Technical Instructions for the Safe Transport of Dangerous Goods》

《The Oil Pollution Act》(OPA)

《Toxic Substances Control Act》 (TSCA)

《US Federal Regulations》

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 – Threshold Values %
Lithium Cobalt Oxide(LiCoO ₂)	12190-79-3	40%~44%	0.1
Copper Foil	7440-50-8	8%~11%	1.0
Aluminum Foil	7429-90-5	4%~6%	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA -Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA -Hazardous Substances
Copper Foil		· ·	· ·	
7440-50-8		^	^	

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Copper Foil	50001b		RQ 5000 lb final RQ
7440-50-8	300010		RQ 2270 kg final RQ

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Lithium Cobalt Dioxide	X		X	v	v
(LiCoO ₂) 12190-79-3	Λ		Λ	X	X
Graphite 7782-42-5	X	X	X		
Copper	X	X	X	v	v
7440-50-8	Λ	Λ	Λ	X	X
Aluminum	v	v	v	v	
7429-90-5	X	X	X	X	

International Regulations

Mexico

National occupational exposure limits

Component	Carcinogen Status	Exposure Limits
Copper Foil 7440-50-8		Mexico: TWA=1 mg/m ³
		Mexico: TWA=0.2 mg/m ³
		Mexico: STEL=2 mg/m³
Aluminum Foil <u>7429-90-5</u>		Mexico: TWA=10mg/m³
Graphite 7782-42-5		Mexico: TWA= 2 mg/m ₃

Mexico - Occupational Exposure Limits – Carcinogens

Canada

WHMIS Hazard Class

Non-controlled

Chemical Name	NPRI
Aluminum	X

In accordance with all Federal, State and local laws.

Section 16. Other Information

NFP	Health Hazards 1	Flammability 0	Instability 0	Physical and
HMIS	Licolth Lionards O	lth Hazards 0 Flammability 0	Instability 0	Chemical Hazards -
ПІЛІК	nealth nazarus u			Personal Protection X

Revision Date: 2019-01-01

Revision Note: No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

---End of Safety Data Sheet---