



BYD MATERIAL/PRODUCT SAFETY DATA SHEET

1. Identification of the Substance or Preparation and Company

Product	Nickel Metal Hydride cells and batterie
Manufacturer	BYD Company Limited
Production sites	Yan An Road, KuiChong, Longgang, Shenzhen, 518119, P.R.China Tel: 86-755-89888888 Fax: 86-755-89773959
Emergency telephone number	Tel: 86-755-89888888-62113

2. Composition & Information on Ingredients

Ingredients	Content	CAS No.	Classification
Nickel hydroxide	≈25 -- 40%	12054-48-7	Carc. Cat. 3; R40 Xn; R20/22 R43 N; R50-53
Metal Hydride Alloy	≈25 -- 40%		
Cobalt oxide	≈3%	1307-96-6	Xn; R22 R43 N; R50-53
Potassium hydroxide	≈6%	1310-58-3	Xn; R22 C; R35
Iron	≈15~25%	7439-89-6	---

3. Hazards Identification

Do not short circuit, puncture, incinerate, crush, immerse, force discharge or expose to temperature above the declared operating temperature range of product. Risk of fire or explosion.  
Under normal conditions of use, the electrode materials and liquid electrolyte they contain are not exposed to the outside, provided the battery integrity is maintained and seals remain intact.

Effects of Overexposure

Eye Effects: In the case of a fire or cell rupture the electrolyte solution inside battery is extremely corrosive to eye tissue and may result in permanent blindness. Contact with nickel oxide may cause minor irritation.

Skin Effect: Contact with electrolyte solution inside battery may cause serious burns to skin tissues. Contact with nickel compounds may cause result in chronic eczema or nickel itch.

Ingestion: Ingestion of electrolyte solution causes tissue damage to throat area and gastro/respiratory tract. Ingestion of nickel compounds causes nausea and intestinal disorders.

Inhalation: No exposure possible except in the case of fire of abuse. Effects of inhalation of nickel compounds vary from mild irritation of nasal mucous membranes to damage of lung tissues proper.

Approved By: *Justin*



Date: *2018.1.2*





#### 4. First Aid measures

The information below refers to exposure to the ingredients.

**Battery Electrolyte:**

**Eye Contact:** Flush with plenty of water for at least 15 minutes if abuse causes safety vents to activate. Get immediate medical attention.

**Skin Contact:** Remove contaminated clothing and flush effected areas with plenty of water for at least 15 minutes. Wash with soap and water.

**Ingestion:** Do not induce vomiting. Dilute by giving water. If available give several glasses of mild. Get immediate medical attention. Do not give anything by mouth to an unconscious person. Call a physician or Poison Control Centre immediately

**Inhalation:** Remove to fresh air. Give oxygen or artificial respiration if needed. Get immediate medical attention.

**Further treatment:** Show this safety data sheet to the doctor in attendance.

#### 5. Fire-fighting measures

**Suitable extinguishing media**

Dry powder, carbon dioxide (CO<sub>2</sub>), sand.

**Extinguishing media which must not be used for safety reasons**

Water, water spray.

**Specific hazards**

Risk of receptacle bursting.

**Special protective equipment for firefighters**

In the event of fire, wear self contained breathing apparatus. Wear personal protective equipment.

**Hazardous decomposition products**

Nickel and cobalt compounds.

#### 6. Accident release measures

The information below refers to exposure to the ingredients.

**Personal precautions**

Remove personnel from area until fumes dissipate. Use personal protective equipment. Avoid contact with skin and eyes.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so.

Do not allow material to contaminate ground water system.

**Methods for cleaning up**

Pick up and transfer to properly labelled containers. Dispose of in accordance with local regulations.

Approved By: *Justin*

Customer Service Dept.1

Date: *2018.1.1*





### 7. Handling and Storage

Handling	The cells and batteries manufactured from them may be highly charged and are capable of high-energy discharge. Care should be taken to handle cells properly to avoid shorting or misuse that will result in rapid uncontrolled electrical, chemical, or heat energy release. Do not short circuit. Do not dispart cell. Do not allow an exposed flame or spark to come near the cells. Do not mix new and used batteries. Keep batteries in non conductive trays.
Storage	The cells and batteries shall not be stored in high temperature, the maximum temperature is 60°C (less than one month), otherwise the cells and batteries maybe leakage. Besides, the cells and batteries shall be protected from short circuit and protected from movement that could result in short circuit.
Other	Follow manufacturer's recommendations regarding maximum recommended currents and operating temperature range.

### 8. Exposure Controls & Personal Protection

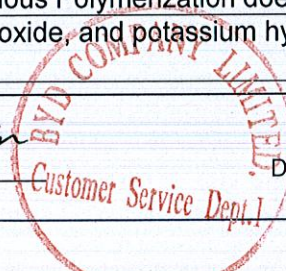
Exposure Values	Limit	Nickel hydroxide, 0.5mg(NI)/m3 TWA Potassium Hydroxide. 2mg/m3 MAC
Respiratory protection		Use NOISH/MSHA approved respirator if cell broken open during a fire to maintain exposure levels below the TWA for hydrogen absorbed alloy and nickel compounds.
Hand protection		If exposure to electrolyte solution, or dried salts is likely, use any water-insoluble non-performance glove, i.e., synthetic rubber. Do not use leather or wool.
Eye protection		Use splash goggles or face shield if cell activates due to abuse.
Other		Rubber apron or equivalent if exposure to electrolyte solution is likely.

### 9. Physical and Chemical Properties

Appearance	Sealed battery
Odour	Odourless
Color	N/A
PH	N/A
Flash Point	N/A unless individual components exposed
Flammability	N/A unless individual components exposed
Rlatetive density	N/A unless individual components exposed
Solutbility(Water)	N/A unless individual components exposed
Aolubility(other)	N/A unless individual components exposed

### 10. Stability and Reliability

Stability	Stable under normal conditions
Condition to avoid	Keep away from heat and sources of ignition
Material to avoid	Aluminum, zinc and other active metals, acid, chlorinated and aromatic hydrocarbons, nitro-carbons, halocarbons. Water.
Hazardous Polymerization	Hazardous Polymerization does not occur
Hazardous decomposition Products	Nickel oxide, and potassium hydroxide

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### 11. Toxicological Information

The information below refers to exposure to the ingredients





Acute toxicity	Nickel hydroxide LD50/oral/rat = 1500mg/kg, potassium hydroxide LD50/oral/rat = 273mg/kg
Local effects	Causes severe burns. Risk of serious damage to eyes. Harmful by inhalation and if swallowed.
Long term toxicity	No data available. Avoid repeated exposure.
Specific effects	May cause sensitization by inhalation and skin contact. Limited evidence of a carcinogenic effect.

**12. Ecological Information**

Mobility	None known if used/disposed of correctly
Persistence and degradability	None known if used/disposed of correctly
Ecotoxicity effects	None known if used/disposed of correctly

**13. Disposal Considerations**

Waste from residues / unused products	The battery is a hazardous waste under RCRA. Dispose of in accordance with appropriate local regulations.. Should not be released into the environment.
Contaminated packaging	Not applicable

**14. Transport Information**

**Transported by air:**

Not classified as dangerous goods in the meaning of air transport regulations.

Regulatory body	Special provision
IATA(59 <sup>th</sup> Edition-2018)	A199

The UN number UN3496 is only applicable in sea transport .Nickel-metal Hydride batteries or Nickel-metal Hydride battery-power devices ,Equipment or vehicles having the potential of a dangerous evolution of heat are not subject to these Regulations provided they are prepared for transport so as to prevent:

- a) a short circuit(e.g. in the case of batteries ,by the effective insulation or exposed terminals ;or ,in the case of equipment ,by disconnection of the battery and protection of exposed terminals);and
- b) unintentional activation

The words "Not Restricted" and the special provision number must be included in the description of the substance on the Air waybill as required by 8.2.6,when an Air waybill is issued.

BYD sealed Nickel Metal Hydride batteries are not subject to these regulations and special provision as their terminals are protected from short-circuit when packaged for transport.

**Transported by sea:**

Classified as dangerous goods in the meaning of sea transport regulations.

According to the meeting of Committee of Experts on the Transport of Dangerous Goods in Geneva, 29 November–7 December 2010, mainly discuss about the draft amendments to the Recommendations on the Transport of Dangerous Goods (Model Regulations and Manual of Tests and Criteria) adopted at the thirty-fifth, thirty-sixth and thirty-seventh sessions. The content includes that adding the Batteries, Nickel-Metal Hydride for transport of dangerous goods only when transported by sea. The hazardous level is the 9<sup>th</sup> level and the UN number is UN3496. (Reference documents: ST/SG/AC.10/C.3/70, Annex and ST/SG/AC.10/C.3/74/Add.1.)

Regulatory body	Special provision
IMDG(38 <sup>th</sup> Edition-2016)	117

SP 117 state: subject to these regulations only when transported by sea

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### 15.Regulatory Information

The preparation is classified as dangerous in accordance with Directive 1999/45/EC.	
<b>Symbol</b>	C - Corrosive N - Dangerous for the environment
<b>R -phrases</b>	R35 - Causes severe burns. R40 - Limited evidence of a carcinogenic effect. R20/22 - Harmful by inhalation and if swallowed. R42/43 - May cause sensitization by inhalation and skin contact. R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
<b>S -phrases</b>	S 1/2 - Keep locked up and out of the reach of children. S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection. S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S60 - This material and its container must be disposed of as hazardous waste. S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

### 16.Other information

The data in this MSDS relates only to the specific material designed herein.

Date issued: 2004/06/20

Last Date Revised: 2018/01/02

Note: This information has been compiled from sources considered to be dependable and is accurate and reliable. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his own particular use. We do not accept liability for any loss or damage that may occur, whether direct, indirect, incidental or consequential, from the use of this information nor do we offer warranty against patent infringement. Additional information is also available by contacting BYD.

Approved By: Justin



Date: 2018.1.2



# Product Information Sheet

## Panasonic Batteries

Panasonic Industrial Devices Sales Company of America  
 A Division Panasonic Corporation of North America  
 1701 Golf Road Suite 3-1100  
 Rolling Meadows, IL 60008  
 Toll Free: 877-726-2228  
 Fax: 847-468-5750  
 Internet: [na.industrial.panasonic.com/products/batteries](http://na.industrial.panasonic.com/products/batteries)  
 e-mail: [oembatteries@us.panasonic.com](mailto:oembatteries@us.panasonic.com)

**Product:** Nickel Metal Hydride Batteries (Ni-Mh)

**Applicable models/sizes:** All

**Revision:** January 1, 2018

The batteries referenced herein are exempt articles and are not subject to the OSHA Hazard Communication Standard requirement. This sheet is provided as a service to our customers.

## SDS

Safety Data Sheets (SDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

*Because all of our batteries are defined as "articles", they are exempt from the requirements of the Hazard Communication Standard; hence a SDS is not required.*

## The following components are found in a Panasonic Nickel-Metal Hydride battery:

Component	Material	Formula	CAS #
Positive Electrode	Nickel II Hydroxide	Ni(OH) <sub>2</sub>	12054-48-7
Negative Electrode	Metal Hydride Alloy	AB <sub>5</sub> Type (See Note)	AB <sub>5</sub> Type (See Note)
Electrolyte	Potassium Hydroxide	KOH	1310-58-3
	Sodium Hydroxide	NaOH	1310-73-2
	Lithium Hydroxide	LiOH	1310-65-2

NOTE: Components of AB<sub>5</sub> alloy include: Lanthanum (La) – CAS# 7439-91-0, Cerium (Ce) – CAS#7440-45-1, Neodymium (Nd) – CAS#7440-00-8, Praseodymium (Pr) – CAS#7440-10-0)

The overall reaction is:  $MH + NiOOH \rightleftharpoons M + Ni(OH)_2$

## Disposal



All Panasonic Nickel Metal Hydride batteries are classified by the federal government as a non-hazardous waste and are safe for disposal in the normal municipal waste stream. Exception: California, which requires these batteries to be disposed of in accordance with the California Universal Waste Rules. These batteries, however, do contain recyclable materials. Panasonic is a Licensee of the Call2Recycle Battery Recycling Program. If you build our cells into a battery pack, please call 1-800-8-BATTERY or go to the Call2Recycle website at [www.call2recycle.org](http://www.call2recycle.org) for additional information on how your branded product can also participate in the program. .

**Notice:** The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Panasonic Industrial Company makes no warranty expressed or implied.

## **Transportation**

Nickel Metal Hydride batteries (sometimes referred to as "Dry cell" batteries) are not listed as dangerous goods under the International Civil Aviation Organization (ICAO), 2017-2018 edition, International Air Transport Association (IATA), 59<sup>th</sup> edition, U.S. Department of Transportation. (DOT), 49 CFR. These batteries are not subject to the dangerous goods regulations provided they meet the requirements contained in the following Special Provisions. Special Provision A199 in the IATA Dangerous Goods Regulations and ICAO Technical Instructions and Special Provision 130 in 49 CFR 172.102 of the U.S. hazardous materials regulations require these batteries to be packed in such a way to prevent short circuits or generating a dangerous quantity of heat. In addition, the IATA Dangerous Goods Regulations and ICAO Technical Instructions require the words "Not Restricted" and "Special Provision A199" to be provided on the air waybill, when an air waybill is issued. Effective January 1, 2012 the International Maritime Organization (IMO) regulates shipments by ocean, in excess of 100 Kg, as a Class 9 dangerous good under UN 3496 and Special Provision 117 and 963.

## **First Aid**

If you get electrolyte in your eyes, flush with water for 15 minutes without rubbing and immediately contact a physician. If you get electrolyte on your skin wash the area immediately with soap and water. If irritation continues, contact a physician. If a battery is ingested, call the National Capital Poison Center (NCPC) at 202-625-333 (Collect) or your local poison center immediately

## **General Recommendations**

**CAUTION:** May explode or leak if short-circuited, inserted improperly, mixed with different battery types or disposed of in fire. Do not open battery.

## **Fire Safety**

In case of fire, use a smothering agent such as dry sand, dry ground dolomite or soda ash. If you use water, use enough to smother the fire. Cooling the exterior of the batteries will help prevent rupturing. Fire fighters should use self-contained breathing apparatus

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