Pony Testing International Group

Report No.：T12041007916D

MSDS Report

Sample Description	Nickel Metal Hydride Battery
Applicant	Yuasa (Tianjin) Technology Ltd.

Pony Testing International Group

www.ponytest.com

Material Safety Data Sheet

Nickel Metal Hydride Battery

Section 1 - Identification of the substance/preparation and of the company/undertaking

Product name : Nickel Metal Hydride Battery

Product model : AAAOT750

Manufacturer : Yuasa (Tianjin) Technology Ltd.

Address : No.99 Haitong avenue export processing zone TEDA Tianjin export

Post code : 300457

TEL : +86-22-66230088

Emergency telephone : +86-22-66230088

FAX : +86-22-66230078

Email : guanping.li@yuasa-tech.com

Chemical uses： 1.2V Low voltage power

Section 2 - Hazards Identification

Hazard Symbols: Xn C N

Risk Phrases: 20/22-35-40-42/43-48/23-50/53-61

Risk advice to man and the environment

The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically,physically, or electrically abused. Damaged battery will release concentrated potassium hydroxide and sodium hydroxide, which is caustic. May explode or leak, and cause burn injury, if recharged, disposed of in

fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label.

Section 3 – Composition/Information on Ingredient

Chemical composition

Component	CAS No.	Formula	Composition	EC No.	Classification
Nickel hydroxide	12054-48-7	$Ni(OH)_2$	15%~30%	235-008-5	Carc. Cat. 1, R49 Repr. Cat. 2, R61 Muta. Cat. 3, R68 T, R48/23 Xn, R20/22 Xi, R38 R42/43 N, R50/53
Nickel	7440-02-0	Ni	20%~30%	231-111-4	Carc. Cat. 3, R40 T, R48/23 R43 R52/53
Cobalt	7440-48-4	Co	2%~10%	231-158-0	Xn, R42/43 R53
Iron	7439-89-6	Fe	10%~30%	231-096-4	F, R11
Manganese	7439-96-5	Mn	1%~5%	231-105-1	F, R11 R15
Mischmetal	/	/	8%~15%	/	/
Aluminium	7429-90-5	Al	0.3%~1%	231-072-3	F, R15 R17
Potassium hydroxide	1310-58-3	KOH	0%~10%	215-181-3	Xn, R22 C,R35
Sodium hydroxide	1310-73-2	NaOH	0%~10%	215-185-5	C,R35
Lithium hydroxide	1310-65-2	LiOH	0%~5%	215-183-4	Xn, R22 C,R35

Section 4-First Aid Measures

Eyes: If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 15 minutes. Occasionally lifting the upper and lower eyelids, until no evidence of the chemical remains. Get medical aid.

Skin: If battery is leaking and material contacts the skin, remove any contaminated clothing and flush exposed skin with copious amounts of running water for at least 15 minutes. If irritation, injury or pain persists, seek medical advice.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical aid. Loosen tight clothing such as a collar, tie, belt or waistband.

Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention if irritation develops or persists. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive.

Notes to Physician: Treat symptomatically.

Section 5 – Fire-Fighting Measures

Suitable Extinguishing Media:

In case of fire where nickel metal hydride batteries are present, apply a smothering agent such as METL-X, sand, dry ground dolomite, or soda ash, or flood the area with water. A smothering agent will extinguish burning nickel metal hydride batteries.Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving nickel metal hydride batteries can be controlled with water.When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended.

Specific Hazards Arising from the Chemical:

Thermal decomposition can lead to release of irritating gases and vapors. Batteries evolve flammable hydrogen gas during charging and may increase fire risk in poorly ventilated areas near sparks, excessive heat or open flames. Thermal shock may cause battery case to crack open. Containers may explode when heated. Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

Protective Equipment and Precautions for Firefighters:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Section 6 - Accidental Release Measures

Personal Precautions:

If the internal battery material leaks. Notify safety personnel of large spills. Caustic potassium hydroxide may be released from leaking or ruptured batteries. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Remove ignition sources, Keep away from heat and flame. Carefully collect batteries and place in an appropriate container for disposal.

Environmental Precautions:

Do not let product enter drains and environment.

Methods for Containment and Clean Up:

Sweep up and place in suitable containers for recycle or disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

Section 7 - Handling and Storage

Handling: Never seal or encapsulate nickel metal hydride batteries. Do not obstruct safety release vents on batteries. Encapsulation (potting)of batteries will not allow cell venting and can cause high pressure rupture. Accidental short circuit for a few seconds will not seriously affect the battery. However, this battery is capable of delivering very high short circuit currents. Prolonged short circuits will cause high cell temperatures which can cause skin burns. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, and metal covered tables or metal belts used for assembly of batteries into devices. Do not open battery. The negative electrode material may be pyrophoric. Should an individual cell from a battery become disassembled, spontaneous combustion of the negative electrode is possible. This is much more likely to happen if the electrode is removed from its metal container. There can be a delay between exposure to air and spontaneous combustion. Replace all batteries in equipment at the same time. Do not carry batteries loose in a pocket or bag. Do not remove battery tester or battery label.

Storage: Store in a cool, dry, well ventilated area. Elevated temperatures can result in loss of battery performance, leakage, or rust. Do not refrigerate – this will not make them last longer. Do not expose the battery to open flames, light and heat. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

Section 8 - Exposure Controls/Personal Protection

Exposure limits:

CAS# 7440-02-0:

ACGIH: United States- TWA: 1.5 mg/m^3 (inhalable)

Australia- TWA: 1 mg/m^3

Belgium - TWA: 1 mg/m^3

Finland-TWA: 0.1 mg/m^3, Skin, Carcinogen

France - VLE: 1 mg/m^3

Japan-OEL: 1 mg/m^3, 2B carcinogen

Korea- TWA: 1 mg/m^3

Netherlands- MAC-TGG: 1 mg/m^3

Russia- STEL: 0.05 mg/m^3, Carcinogen

CAS# 7440-48-4:

ACGIH: United States- TWA: 0.02 mg/m^3

Australia- TWA: 0.05 mg/m^3

Belgium - TWA: 0.02 mg/m^3 (fume, dust)

Denmark- TWA: 0.01 mg(Co)/m^3

Finland-TWA: 0.05 mg/m^3, Skin

Japan-OEL: 0.05 mg/m^3, 2B carcinogen

Mexico- TWA: 0.01 mg(Co)/m^3

Netherlands- MAC-TGG: 0.02 mg/m^3

New zealand - TWA: 0.05 mg/m^3 (dust and fume)

Russia-STEL: 0.5 mg/m^3

United Kingdom- STEL: 2 mg/m^3

CAS# 7439-89-6:

Russia- TWA: 10 mg/m^3

CAS# 7439-96-5:

ACGIH: United States- TWA: 0.2 mg/m^3

Australia-TWA:1 mg/m^3 (dust); STEL: 3 mg/m^3 (fume)

Belgium - TWA: 0.2 mg/m^3

France - VME: 1 mg/m^3 (fume)

Netherlands- MAC-TGG: 1 mg/m^3

Russia- TWA: 0.1 mg/m^3; STEL: 0.6 mg/m^3

CAS# 7429-90-5:

ACGIH: United States- TWA: 10 mg/m^3 (dust)

Australia- TWA: 2 mg(Al)/m^3;5 mg/m^3 (pyro powders); 5 mg/m^3 (welding fumes)

Belgium- TWA: 10 mg/m^3;5 mg/m^3 (pyro powders); 5 mg/m^3 (welding fumes)

Denmark- TWA:10 mg(Al)/m^3; 10 mg/m^3 (dust)

France-VME: 10 mg/m^3, 5 mg/m^3 (fume, resp. dust)

Germany-MAK: 1.5 mg/m^3 (respirable)

Japan-OEL: 0.5 mg/m^3 (respirable); 2 mg/m^3 (total)

Korea- TWA: 10 mg/m^3 (metal dust);5 mg/m^3 (pyro powders); 5 mg/m^3 (welding fumes)

Netherlands- MAC-TGG: 10 mg/m^3

Russia-STEL: 2 mg/m^3

United kingdom- TWA: 10 mg/m^3 (inhalable); 4 mg/m^3 (respirable)

CAS# 1310-58-3:

ACGIH: United States- ceiling concentration 2 mg/m^3

Australia- ceiling concentration 2 mg/m^3

Belgium - STEL: 2 mg/m^3

Denmark- ceiling concentration 2 mg/m^3

Finland-TWA: 2 mg/m^3

France - VLE: 2 mg/m^3

Japan-OEL: continuous 2 mg/m^3

Korea-ceiling concentration 2 mg/m^3

Netherlands- MAC-TGG: continuous 2 mg/m^3

United Kingdom- STEL: 2 mg/m^3

CAS# 1310-73-2:

ACGIH: United States- ceiling concentration 2 mg/m^3

United kingdom- STEL: 2 mg/m^3

Australia - ceiling concentration 2 mg/m^3

Belgium - TWA: 2 mg/m^3 (as Al)

France - VME: 2 mg/m^3

Japan-OEL continuous 2 mg/m^3

www.ponytest.com & Hotline 400-819-5688

Add：Yingzhi Building, No.49-3, Suzhou Road,Haidian District, Beijing
Tel: (010)82618116
Fax: (010)86219629
E-mail: pony@ponytest.com

Building 35, No.680, Guiping Road, Xuhui District, Shanghai
(021)64851999
(021)64856403
csh@ponytest.com

Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
(0755)26050909
(0755)26068336
sz@ponytest.com

Netherlands- MAC-TGG: 2 mg/m^3

CAS# 1310-65-2:

Japan-OEL: 1 mg/m^3

New zealand - STEL: 1 mg/m^3

United Kingdom- STEL: 1 mg/m^3

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Individual Protection for Industrial Use

Eyes: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.

Skin: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Clothing: Not necessary under normal conditions. Wear appropriate protective clothing if handling an open or leaking battery.

Respirators: In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting batteries. Respiratory Protection is not necessary under conditions of normal use.

Other Protection: Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. To maintain good health habits.

Section 9 - Physical and Chemical Properties

Physical State:	Cylindrical
Color:	Metallic color
Odor:	Odorless
Normal Voltage:	1.2V
Capacity:	750mAh
Maximum Charging Current:	680mA
Weight:	12.0g
Solubility in water:	Insoluble

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures**.**

Conditions to Avoid: Incompatible materials. Prolonged short circuit or recharge, sources of ignition, excess heat, exposure to moist air or water. Mechanical abuse and electrical abuse.

Incompatibilities with Other Materials: Strong oxidants, strong acids.

Hazardous Decomposition Products: Hazardous decomposition products may formed under fire conditions. Burning nickel metal hydride batteries can produce toxic fumes including oxides of nickel, cobalt, aluminum and manganese.

Hazardous Polymerization: Will not occur.

Hazardous Reactions: None under normal processing.

Section 11 - Toxicological Information

Acute toxicity:

CAS# 12054-48-7:

Inhalation, rat: LC50 = 1200 mg/m^3/4H;

Oral, rat: LD50 = 1515 mg/kg;

Skin, rat: LD50 > 2 gm/kg;

CAS# 7440-48-4:

Oral, rat: LD50 = 6171 mg/kg;

CAS# 7439-89-6:

Oral, rat: LD50 = 30 gm/kg;

Oral, guinea pig: LD50 = 20 gm/kg;

CAS# 7439-96-5:

Oral, rat: LD50 = 9 gm/kg;

CAS# 1310-58-3:

Oral, rat: LD50 = 273 mg/kg;

CAS# 1310-73-2:

Draize test, rabbit, eye: 400 ug Mild;

Draize test, rabbit, eye: 1% Severe;

Draize test, rabbit, eye: 1 mg/24H Severe;

Draize test, rabbit, skin: 500 mg/24H Severe;

CAS# 1310-65-2:

Oral, rat: LD50 = 210 mg/kg;

Oral, mouse: LD50 = 363 mg/kg;

Sensitisation: No information available

Chronic exposure: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Nickel hydroxide - California: carcinogen, initial date 10/1/89 NTP: Known carcinogen (Nickel compounds). IARC: Group 1 carcinogen.

Nickel - This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification. IARC: Group 2B - Possibly carcinogenic to humans.

Cobalt - This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification. IARC: Group 2B - Possibly carcinogenic to humans.

Iron- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Manganese - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Mischmetal- The toxicological properties have not been thoroughly investigated.

Aluminum - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Potassium hydroxide - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Sodium hydroxide - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Lithium hydroxide - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Potential Health Effects

Eye: No special hazard risk under normal use. Contents of an open battery may cause severe irritation and burns. Contact can also cause ulceration of the conjunctiva and cornea. Eye damage is possible.

Skin: No special hazard risk under normal use. Contents of an open battery may cause severe irritation and burns. Nickel, nickel compounds, cobalt, and cobalt compounds can cause skin sensitization and an allergic contact dermatitis.

Ingestion: Swallowing a battery can be harmful. May cause severe and permanent damage to the digestive tract. May cause circulatory system failure. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Inhalation: Inhalation of a mist of this material may cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. Hypersensitivity to nickel can cause allergic pulmonary asthma.

Additional Information:

RTECS#: CAS# 12054-48-7: QR7040000/ CAS# 7440-02-0: QR5950000/CAS# 7440-48-4: GF8750000/ CAS# 7439-89-6: NO4565500 / CAS# 7439-96-5: OO9275000/ CAS# 7429-90-5: BD0330000 BD1020000/ CAS# 1310-58-3: TT2100000/ CAS# 1310-73-2: OJ6307070/ CAS# 1310-65-2: OJ6307070

Section 12 - Ecological Information

Persistence and Degradability: No information available

Ecotoxicity: No information available

Further information on ecology: No information available

Other: Do not allow product to reach ground water, water course or sewage system.

Section 13 - Disposal Considerations

Waste from Residues / Unused Products: Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Contaminated packaging: Contaminated packaging material should be treated equivalent to residual chemical. Clean packaging material should be subjected to waste management schemes (recovery recycling, reuse) according to local legislation.

Section 14 - Transport Information

	IATA	IMDG	RID/ADR
Proper shipping name	Not regulated	Not regulated	Not regulated
Hazard class			
Un number			
Packing group			

Nickel metal hydride cylindrical cells/batteries are considered to be “dry cell” batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Civic Aviation Administration (ICAO), International Air Transport Association (IATA), the International Maritime Organization (IMO), the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and the regulations concerning the international transport of dangerous goods by rail (RID).

IATA DGR: Special Provision A123: Examples of such batteries are: alkali-manganese,zinc-carbon, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery ... having the potential of a dangerous evolution of heat must be prepared for transport as to prevent (a) a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals...) is forbidden from transport; and (b) accidental 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.

Special Provision 304 (ADR/RID): Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are “not subject to the requirements” provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries.

Section 15 - Regulatory Information

Regulatory Information: Labelling according to EC Directives

Labelling

Hazard Symbols: Xn C N

Risk Phrases:

R 20/22 Harmful by inhalation and if swallowed.

R 35 Causes severe burns.

R 40 Limited evidence of a carcinogenic effect.

R 42/43 May cause sensitization by inhalation and skin contact.

R 48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 61 May cause harm to the unborn child.

Safety Phrases:

S 16 Keep away from sources of ignition.

S 24 Avoid contact with eyes.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 60 This material and its container must be disposed of as hazardous waste.

S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

Canada

All chemicals in this product with known CAS numbers are listed on Canada's DSL List.

US Federal

Toxic Substance Control Act (TSCA)

All chemicals in this product with known CAS numbers are listed on the TSCA Inventory.

Section 16 - Additional Information

MSDS Creation Date: 1 Jan 2013

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control

and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Text of R-phrases mentioned in Section 3

R 11 Highly flammable.

R 15 Contact with water liberates extremely flammable gases.

R 17 Spontaneously flammable in air.

R 20/22 Harmful by inhalation and if swallowed.

R 22 Harmful if swallowed.

R 35 Causes severe burns.

R 38 Irritating to the skin.

R 40 Limited evidence of a carcinogenic effect.

R 43 May cause sensitization by skin contact.

R 42/43 May cause sensitization by inhalation and skin contact.

R 48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 53 May cause long-term adverse effects in the aquatic environment.

R 61 May cause harm to the unborn child.

R 68 Possible risk of irreversible effects.

Other Information:

ACGIH:（American Conference of Governmental Industrial Hygienists）; CAS:（Chemical Abstracts Service）; DSL:（the Domestic Substances List of Canada）; EC:（European Commission）; IARC:（International Agency for Research on Cancer）;IATA:（International Air Transport Association）; IMDG:（International Maritime Dangerous Goods）;ADR: (European Agreement Concerning the International Carriage of Dangerous Goods by Road);RID: (Regulations Concerning the International Carriage of Dangerous Goods by Rail); LD50:（Lethal dose, 50 percent kill）; NDSL:（the Non-domestic Substances List of Canada）; NIOSH:（US National Institute for Occupational Safety and Health）;NTP:（US National Toxicology Program）;OSHA:（US Occupational Safety and Health）; RTECS:（Registry of Toxic Effects of Chemical Substances）; TDG:（Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations）; TSCA:（Toxic Substances Control Act of USA）