SECTION 1. CHEMICIAL PRODUCT AND COMPANY NAME

Nickel Metal Hydride Battery

Safety Data Sheet

Complies with the OSHA Hazard Communication Standard : 29 CFR 1910 1200

Makita U.S.A., Inc.
14930-C Northam Street
La Mirada, CA 90638

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Date Revised: 08/12/2014

EMERGENCY CONTACT INFORMATION

Telephone Number for Information: MAKITA: 1-510-657-9881

Emergency Response

For Chemical Emergency
Spills, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada 1-800-424-9300

SECTION 2. HAZARD IDENTIFICATION

Most Important Hazard and Effects:

The battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials leakage.
However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by misuse, the gas release vent will be operated. The battery cell case will be breached at the extreme. Hazardous materials may be released.
Moreover, if heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

Human Health Effects:

Inhalation: The electrolyte inhalation affects the respiratory tract membrane and the lungs. Cadmium fume may cause a cough, chest pain and dyspnea. Bronchitis and pneumonia will be occurred. Probably, it is carcinogen

Skin Contact: The electrolyte skin contact affects the skin seriously and may cause dermatitis.

Eye Contact: The electrolyte leaked from the battery cell is strong alkali. When it goes into eye, the cornea may be affected and it may lead to blindness.

Ingestion: The electrolyte ingestions irritates the mouth and the throat seriously results in vomiting, nausea, hematemesis, stomach pains and diarrhea.

Environmental Effects: Since a battery cell remains in the environment, do not dispose it into the normal waste stream.

Specific Hazards: As previously described.

SECTION 3. COMPOSITION / INFORMATION OR INGREDIENTS

Substance or preparation: Preparation information about the chemical nature of product

Common Chemical Name / General Name	CAS Number	Concentration / Concentration Range	Classification and Hazard Labeling
Hydrogen Absorbing Alloy	7440-02-0 (Ni) 7440-48-4 (Co) 7439-96-5 (Mn) 7429-90-5 (Al)	20-40 %	Specific Hazard
Nickel-Cobalt-Zinc Oxide	7440-02-0 (Ni) 7440-48-4 (Co) 7440-66-6 (Zn)	15-25%	Acute Toxicity Specific Hazard
Nickel	74420-02-0	5-15%	Specific Hazard
Iron	7439-89-6	20-40%	-
Carbon Black	1333-86-4	0-1%	Specific Hazard
Potassium Hydroxide	1310-58-3	0-15%	Acute Toxicity Corrosivity Irritant Property
Sodium Hydroxide	1310-73-2		
Lithium Hydroxide	1310-65-2		

SECTION 4. FIRST AID MEASURE

Internal cell materials of an opened battery cell:

Inhalation: Cover the victim in a blanket, move to the place of fresh air and keep quiet. Seek medical attention immediately when dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

Skin Contact: Remove contaminated clothes and shoes immediately. Wash the adherence or contact region with soap and plenty of water. Seek medical attention immediately.

Eye Contact: Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and internal cell materials of an opened battery cell:

Ingestion: Do not induce vomiting. Seek medical attention immediately

SECTION 5. FIRE FIGHTING MEASURES

Although a battery cell is not flammability, in case of fire move it to the safe place quickly.
The following measures are taken when it cannot be moved.

Suitable Extinguishing Media: Dry sand, chemical powder fire extinguishing medium.

Specific Hazards: Acid or harmful fume is emitted during fire.

Special Protective Equipment For Firefighters: Protective equipment written in section 8.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Internal cell materials, such as electrolyte leaked from battery cell, are carefully dealt with according to the followings:

Personal Precautions: Forbid unauthorized person to enter. Remove leaked materials with protective equipment written in section 8.

Environmental Precautions: Do not throw out into the environment.

Method Of Recovery and Neutralization: Dilute the leaked electrolyte with water and neutralize with diluted sulfuric acid. Any exposed solid that contains the electrolyte is to be placed into a container. The area exposed to the electrolyte should be fully flushed with water.

SECTION 7. HANDLING AND STORAGE

Handling

Technical Measures:

Prevention Of User Exposure: Not necessary under normal use

Prevention Of Fire and Explosion: Not necessary under normal use

Precaution For Safe Handling: Do not damage or remove the external tube

Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water and seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or throw down. Never disassemble, modify or deform. Do not connect the positive terminal to the negative with electrically conductive material. In case of charging, use only a charger specified by Makita.

Storage

Technical Measures:

Storage Conditions (suitable to be avoided): Avoid direct sunlight, high temperature, high humidity. Store in cool places (temperature: -20 ~ 30 degree C, humidity: from 40 to 80%).

Incompatible Products: Conductive materials, water, seawater, strong oxidizers and strong acids.

Packing Material (recommended, not suitable): Insulative and tear-proof materials are recommended.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Measures:

No engineering measure is necessary during normal use. In case of internal cell materials' leakage, the information below will be useful.

Control Parameters:

Common Chemical Name / General Name	**ACGIH (2007)**	
	TLV-TWA	BEI
Nickel, Nickel Compounds	(As Ni) Metal: 1.5mg/m^3 Soluble compounds: 0.1mg/m^3 Insoluble compounds: 0.2mg/m^3	-
Cobalt Compounds	(As Co) 0.02mg/m^3	In urine: 15 micro g/l In blood: 1 micro g/l
Manganese Compounds	(As Mn) 0.2mg/m^3	-
Aluminum Compounds	(As Al) 5mg/m^3 (Flammable powder)	-
Zinc Oxide	2mg/m^3	-

CONTINUED: SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Carbon Black	$3.5mg/m^3$	-
Potassium Hydroxide	-	-
Sodium Hydroxide	-	-
Lithium Hydroxide	-	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.
TLV-TWA: Threshold Limit Value-time weighted average concentration
BEI: Biological Exposure Indices

Personal Protective Equipment

Respiratory Protection: Protective mask

Hand Protection: Protective gloves

Eye Protection: Protective glasses designed to protect against liquid splashes

Skin and Body Protection: Working clothes with long sleeve and long trousers

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical State: Solid

Form: Cylindrical and Prismatic

Color: Metallic color (without tube/label)

Odor: No odor

pH: N/A

Specific temperatures/temperature ranges at which changes in physical state occur:
There is no useful information for the product as a mixture.

Flash Point: N/A

Explosion Properties: N/A

Density: Around $1.5 \sim 6.0 g/cm^3$

Solubility, with indication of the solvent(s): Insoluble in water:

SECTION 10. STABILITY AND REACTIVITY

Stability: Stably under normal use

Hazardous reactions occurring under specific conditions: By misuse of a battery cell or the like, oxygen or hydrogen accumulates in the cell and the internal pressure rises. These gases may be emitted through the gas release vent. When fire is near, these gases may take fire. When a battery cell is heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

Conditions to Avoid: Direct sunlight, high temperature and high humidity.

Materials to Avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.

Hazardous Decomposition Products: Acrid or harmful fume is emitted during fire

SECTION 11. TOXICOLOGICAL INFORMATION

There is no data available on the product itself. The information of the internal cell materials is as follows:

Nickel, Nickel Compounds:

Acute Toxicity:

oral	GHS: - out of category
skin	Unknown
inhalation (gas)	GHS: exempt from a classification
inhalation (steam)	Unknown
inhalation (mist)	Unknown

Skin Corrosivity:

Unknown

Serious Damage and Irritant Property For Eyes:

Unknown

Respiratory or Skin Sensitization:

Respiratory Sensitization:

GHS: Category 1

The allergy, asthma or breathing difficulties might be caused when inhaling.

Skin Sensitization:

GHS: Category 1

The allergic skin reaction might be caused.

Germline Mutagenicity:

GHS: it is not possible to classify it due to data deficiency

Carcinogenicity:

GHS: Category 2

ACGIH:	(Metal) A-5 - Not suspected as a human carcinogen
ACGIH:	(Water-soluble compounds) A4 - Not classified as a human carcinogen obviously
ACGIH:	(Insoluble compounds) A1 - Confirmed human carcinogen
NIOSH:	Potential occupational carcinogen
NTP:	Reasonably anticipated to be human carcinogen
IARC:	(Metal) Group 2B possible carcinogenic to human
IARC:	(Compounds) Group 1 carcinogenic to human

Reproduction Toxicity:

GHS: It is not possible to classify it due to data deficiency.

Certain Target Organ/Systemic Toxicity (single exposure):

GHS: Category 1 (respiratory organ and kidney)

The disorder of the respiratory organ and the kidney is caused.

Certain Target Organ/Systemic Toxicity (repeated exposure):

GHS: Category 1 (respiratory organ)

The disorder of the respiratory organ is caused by long-term or repeated exposure.

Cobalt Compounds:

Acute Toxicity:

oral	GHS: out of category
skin	Unknown
inhalation (gas)	GHS: exempt from a classification.
inhalation (steam)	Unknown
inhalation (mist)	GHS: It is not possible to classify it due to data deficiency.

Skin Corrosivity:

Unknown

Serious Damage and Irritant Property For Eyes:

Unknown

Respiratory or Skin Sensation:

Respiratory Sensitization:

GHS: Category 1

The allergy, asthma or breathing difficulties might be caused when inhaling.

Skin Sensitization:

GHS: Category 1

The allergic skin reaction might be caused.

CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION

Germline Mutagenicity:
Unknown

Carcinogenicity:
GHS: Category 2
ACGIH: A3 - Confirmed animal carcinogen but relevance to human carcinogen is unknown.
IARC: Group 2B Possible carcinogenic to human.
The cancer might be caused.

Reproduction Toxicity:
GHS: Category 2
The adverse effect on reproductive competence or the fetus might occur.

Certain Target Organ/Systemic Toxicity (single exposure):
GHS: Category 3 (respiratory tract irritating properties)
The respiratory organ might be stimulated

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1 (respiratory organ)
The disorder of the respiratory organ is caused by long-term or repeated exposure

Manganese Compound:

Acute Toxicity:

oral	GHS:	Out of category
skin	GHS:	Unknown
inhalation (gas)	GHS:	Exempt from a classification
inhalation (steam, mist)	GHS:	Unknown

Skin Corrosivity:
GHS: Category 3 Slight skin stimulation

Serious Damage and Irritant Property For Eyes:
GHS: Category 2B eye stimulation

Respiratory or Skin Sensation:

Respiratory Sensitization:
Unknown

Skin Sensitization:
Unknown

Germline Mutagenicity:
GHS: It is not possible to classify

Carcinogenicity:
GHS: Out of category

Reproduction Toxicity:
GHS: Category 1B
The adverse effect on reproductive competence or the fetus might occur.

Certain Target Organ/Systemic Toxicity (single exposure):
GHS: Category 1 (respiratory organ)
The disorder of the respiratory organ is caused

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1 (respiratory organ, nerve)
The disorder of the respiratory organ and nerve system is caused by long-term or repeated inhalation exposure.

Aluminum Compounds:

Acute Toxicity:

oral	Unknown
skin	Unknown
inhalation (steam)	Unknown
inhalation (dust)	Unknown

Skin Corrosivity:
Unknown

Serious Damage and Irritant Property For Eyes:
Unknown

CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION

Respiratory or Skin Sensation:
Respiratory Sensitization:
Unknown
Skin Sensitization:
Unknown
Germline Mutagenicity:
Unknown

Carcinogenicity:
Unknown

Reproduction Toxicity:
Unknown

Certain Target Organ/Systemic Toxicity (single exposure):
Unknown

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1 and 2
The disorder of the pulmonary is caused by long-term or repeated inhalation exposure. (Category 1)
The disorder of the nerve system by long-term or repeated oral exposure might be caused. (Category 2)

Zinc Oxide:

Acute Toxicity:

oral	rat LD50 > 5000 mg/kg
inhalation (dust / mist)	rat LD50 > 5.7 mg/1 The harmful might be caused when inhaling.

Skin Corrosivity:
GHS - Out of Category

Serious Damage and Irritant Property For Eyes:
GHS - Out of Category

Respiratory or Skin Sensation:
Respiratory Sensitization:
Unknown
Skin Sensitization:
GHS - Out of Category
Germline Mutagenicity:
Unknown
Carcinogenicity:
GHS: Out of Category
Reproduction Toxicity:
GHS: Out of Category

Certain Target Organ/Systemic Toxicity (single exposure):
GHS: Category 1
The disorder of the whole body

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1
The disorder of the pulmonary is caused by long-term or repeated inhalation exposure.

Carbon Black:

Acute Toxicity:

oral	rat LD_{50} 15400 mg/kg
skin	Unknown
inhalation (dust)	Unknown

Skin Corrosivity:
Unknown

CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION

Serious Damage and Irritant Property For Eyes:
Unknown

Respiratory or Skin Sensation:

Respiratory Sensitization:
Unknown

Skin Sensitization:
Unknown

Germline Mutagenicity:
Unknown

Carcinogenicity:
GHS: Category 2
ACGIH: A3 - Confirmed animal carcinogen but relevance to human carcinogen is unknown
IARC: Group 2B Possible carcinogenic to human
Could be cancer causing

Reproduction Toxicity:
Unknown

Certain Target Organ/Systemic Toxicity (single exposure):
Unknown

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1 (respiratory organ)
The disorder of the pulmonary is caused by long-term or repeated inhalation exposure

Potassium Hydroxide:

Acute Toxicity:

oral	GHS: Category 3 Harmful if swallowed
skin	GHS: It is not possible to classify
inhalation (steam)	GHS: It is not possible to classify
inhalation (dust)	GHS: It is not possible to classify

Skin Corrosivity:
GHS: Category 1B
Serious chemical wound of the skin and damage of eyes is caused

Serious Damage and Irritant Property For Eyes:
GHS - Category 1

Respiratory or Skin Sensation:

Respiratory Sensitization:
GHS: It is not possible to classify

Skin Sensitization:
GHS: Out of Category

Germline Mutagenicity:
GHS: Out of category

Carcinogenicity:
GHS: It is not possible to classify

Reproduction Toxicity:
GHS: It is not possible to classify

Certain Target Organ/Systemic Toxicity (single exposure):
GHS: Category 1 (respiratory system)
The disorder of the respiratory system is caused

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: It is not possible to classify

Sodium Hydroxide:

Acute Toxicity:

oral	GHS: It is not possible to classify
skin	GHS: It is not possible to classify

CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION

inhalation (gas) GHS: Out of category
inhalation (steam) Unknown
inhalation (dust) Unknown

Skin Corrosivity:
GHS: Category 1
Serious chemical wound of skin and damage of eyes is caused

Serious Damage and Irritant Property For Eyes:
GHS: Category 1
Can cause serious eye damage

Respiratory or Skin Sensation:
Respiratory Sensitization:
GHS: It is not possible to classify
Skin Sensitization:
GHS: Out of Category

Germline Mutagenicity:
GHS: Out of category

Carcinogenicity:
GHS: It is not possible to classify

Reproduction Toxicity:
GHS: It is not possible to classify

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: It is not possible to classify
The disorder of the respiratory organ is caused

Lithium Hydroxide:

Acute Toxicity:
oral GHS: Category 3 - Harmful if swallowed
skin GHS: Unknown
inhalation (steam) GHS: Unknown
inhalation (dust) GHS: Category 3 - Harmful if inhaled

Skin Corrosivity:
GHS - Category 1
Serious chemical wound of skin and damage of eyes is caused

Serious Damage and Irritant Property For Eyes:
GHS - Category 1

Respiratory or Skin Sensation:
Respiratory Sensitization:
GHS: It is not possible to classify
Skin Sensitization:
GHS: It is not possible to classify

Germline Mutagenicity:
Unknown

Carcinogenicity:
Unknown

Reproduction Toxicity:
Unknown

Certain Target Organ/Systemic Toxicity (single exposure):
GHS: Category 1 (respiratory system)
The disorder of the respiratory system is caused by inhalation exposure

Certain Target Organ/Systemic Toxicity (repeated exposure):
GHS: Category 1 & 2
The disorder of the respiratory system is caused by long-term or repeated inhalation exposure.
The disorder of the liver and the hematopoietic system by long-term or repeated oral exposure might be caused.

SECTION 12. ECOLOGICAL INFORMATION

Persistence / Degradability:

Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment

SECTION 13. DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Do not throw out a used battery cell. Recycle it through a recycling company

Contaminated Packaging:

Neither a container nor packaging is contaminated during normal use. When a container or package is contaminated due to a battery's internal materials leaking, they should be dispose of as industrial waste subject to special control.

SECTION 14. TRANSPORT INFORMATION

MAKITA sealed Nickel Metal Hydride batteries are considered to be "dry cell" batteries and are not subject to dangerous goods regulation for the purpose of transportation by the U.S. Department of Transportation (DOT, the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) or the International Maritime Dangerous Goods regulations (IMDG). The only DOT requirement for shipping Nickel Metal Hydride batteries is Special Provision 130 which states" Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals)." IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

This battery doesn't correspond to dangerous article of the United Nations transportation regulations. Moreover, this article doesn't correspond to dangerous article to which transportation is restricted by the following decree and guideline.

- TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR (ICAO)
- IATA Dangerous Goods Regulations (IATA)
- INTERNATIONAL MARITIME DANGEROUS GOODS CODE (IMO)
- CODE OF FEDERAL REGULATIONS (U.S.DOT)

In the case of transportation, confirm no leakage and no spillage from a container. The cargo should not have fallen, been dropped or broken. Prevent collapse of cargo piles and wetting by rain. The container must be handled carefully. Do not give impacts that result in a mark of hitting on a cell. Moreover, take the protection measures not to short-circuited the batteries. Please refer to Section 7 - HANDLING AND STORAGE also.

SECTION 15. REGULATORY INFORMATION

Regulations Specifically Applicable To The Product:

Waste Management and Public Cleaning Law (Japan)

Law for Promotion Effective Utilization of Resources (Japan)

Commission Directive 2006/66/EU (EU)

SECTION 16. OTHER INFORMATION

The information contained in this Safety Data Sheet is based on the present state of knowledge and current legislation.

CONTINUED: SECTION 16. OTHER INFORMATION

This Material Safety Data Sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

REFERENCE:

Chemical substances information: Japan Advanced Information Center of Safety and Health

International Chemical Safety Cards (ICSCs):
International Occupational Safety and Health Information Center (CIS)

2005 TLVs and BEIs: American Conference of Governmental Industrial Hygienists (ACGIH)

NIOSH CARCINOGEN LIST: National Institute for Occupational Safety and Health (NIOSH)

The Ninth Report on Carcinogen: National Toxicology Program (NTP)

IARC Monographs Program on the Evaluation of Carcinogenic Risks to Humans:
International Agency for Research on Cancer (IARC)

Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

National Institute of Technology and Evaluation (NITE)