**SECTION 1. CHEMICIAL PRODUCT AND COMPANY NAME**

## Nickel Cadmium Rechargeable Battery Pack

# 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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**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**

**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 may occur. This could be a carcinogen. |
| **Skin Contact:** | Electrolyte contact with the skin may have serious affects and may cause dermatitis. |
| **Eye Contact:** | The electrolyte leaked from a battery cell is a strong alkali. If it comes into contact with the eye the cornea may be affected and it may lead to blindness. |
| **Ingestion:** | The ingestion of electrolyte will irritate the mouth and the throat seriously resulting in vomiting, nausea, hematemesis, stomach pains and diarrhea. |
| **Environmental Effects:** | The battery maybe harmful to the environment and should be disposed of according to Local, State & Federal Regulations. |

**SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS**

The product is a manufactured article as described in 29 CFR 1910.1200. 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.

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 |
|---|---|---|---|
| Nickel, Nickel Compounds | 7440-02-0 | 15-40% | Specific Hazard |
| Cadmium, Cadmium Compounds | 7440-43-9 | 10-40% | Specific Hazard |
| Cobalt Compounds | 7440-48-4 | 0-3% | Specific Hazard |
| Carbon Black | 1333-86-4 | 0-1% | Specific Hazard |
| Iron | 7439-89-6 | 20-65% | - |
| | | | |

**CONTINUED: SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS**

| | | | | |
|---|---|---|---|---|
| However, if exposed to a fire, explosion, 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 intensely by the surrounding fire, acid or harmful fume may be emitted. | Potassium Hydroxide | 1310-58-3 | 0-5% | Acute Toxicity<br>Corrosivity<br>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 (short of oxygen), give artificial respiration immediately.

**Skin Contact:** Remove contaminated clothes and shoes immediately. Wash the contacted 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.

**Ingestion:** If a battery cell and internal cell materials of an opened battery cell are ingested, do not induce vomiting. Seek medical attention immediately

**SECTION 5. FIRE FIGHTING MEASURES**

Although a battery cell is not flammable, in case of fire move it away from the fire as quickly as possible. The following measures should be 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 "Exposure Controls/ Personal Protection" 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 materials if contaminated with electrolyte with protective equipment written in "Exposure Controls/ Personal Protection" 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. The leaked solid is moved to a container. The leaked place is 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 expose cells in a fire or 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 dedicated charger or charge according to the conditions specified by Makita.

**Storage -Technical Measures:**

**Storage Conditions (suitable to be avoided):** Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature :-30 ~ 35 degree C, humidity : 45 ~ 85%).

**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** | **ACGHI** | |
|---|---|---|
| | **TLV-TWA** | **BEI** |
| Nickel, Nickel Compounds | (As Ni)<br>Metal: 1.5mg/$m^3$<br>Soluble compounds: 0.1mg/$m^3$<br>Insoluble compounds: 0.2mg/$m^3$ | - |
| Cadmium, Cadmium Compounds | (As Cd)<br>Simple substance: 0.01 mg/$m^3$<br>Compounds: 0.002mg/$m^3$ | In urine: 5 micro g/l<br>In blood: 5 micro g/l |
| Cobalt Compounds | (As Co)<br>0.02mg/$m^3$ | In urine: 15 micro g/l<br>In blood: 1 micro g/l |
| Carbon Black | 3.5mg/$m^3$ | - |
| Potassium Hydroxide | - | - |
| Sodium Hydroxide | - | - |
| Lithium Hydroxide | - | - |
| Nickel, Nickel Compounds | (As Ni)<br>Metal: 1.5mg/$m^3$<br>Soluble compounds: 0.1mg/$m^3$<br>Insoluble compounds: 0.2mg/$m^3$ | - |

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

## CONTINUED: SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Personal Protection:**

**Respiratory Protection:** Protective mask

**Eye Protection:** Protective glasses designed to protect against liquid splashes

**Hand Protection:** Protective gloves

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

The Toxic Substances Control Act (TSCA), does not apply to the battery, because it is not a chemical substance but an article.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:**

**Physical State:** Solid

**Form:** Cylindrical

**Color:** Metallic color (without tube)

**Odor:** No odor

**PH:** N/A

**Specific Temperatures/Temperature Ranges At Which Changes In Physical Sate Occur:**
There is no useful information for the product as a mixture.

**Flash Point:** N/A

**Explosion Properties:** N/A

**Density:** About 2.4 ~ 4. 0g/$cm^3$

**Solubility, With Indication Of The Solvent (s):** Insoluble in water

## SECTION 10. STABILITY AND REACTIVITY

**Stability:** Stable 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 catch fire.

**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:** Acid 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

### Cadmium, Cadmium Compounds:

**Acute Toxicity:**

| | |
|---|---|
| oral | GHS - Category 4 (Swallowing is harmful) |
| skin | Unknown |
| inhalation (dust) | GHS: Category 1 (It is dangerous in the life when inhaling) |

**Skin Corrosivity:**
Unknown

**Serious Damage and Irritant Property For Eyes:**
Unknown

**Respiratory or Skin Sensation:**
Unknown

**Germline Mutagenicity:**
GHS: Category 2
The hereditary disorder might be caused

**CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION**

**Carcinogenicity:**

GHS: Category 1A
ACGIH: A-2 - Suspected human carcinogen
NIOSH: Potential occupational carcinogen
NTP: Known to be a human carcinogen
IARC: Group 1 carcinogenic to human

**Reproduction Toxicity:**

GHS: Category 2
Harmful effects on reproductive capacity or fetus might be exerted

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

GHS: Category 1
Damage of lungs and the respiratory organ is caused
Overexposure causes the pulmonary disorder

**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, 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

**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
May cause cancer

**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

**CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION**

### Carbon Black:

**Acute Toxicity:**

| | |
|---|---|
| oral | rat LD50 15400 mg/kg |
| skin | Unknown |
| inhalation (dust) | Unknown |

**Skin Corrosivity:**
Unknown

**Serious Damage and Irritant Property For Eyes:**
Unknown

**Respiratory or Skin Sensitization:**

**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 |

May cause cancer

**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 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 organ is caused

**CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION**

**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 |
| 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
Serious damage of eyes is caused

**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 organ is caused

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

### 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

## CONTINUED: SECTION 11. TOXICOLOGICAL INFORMATION

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

GHS: Category 1

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

**Bioaccumulation:**

Cadmium bioaccumulation occurs in plants and marine food in the human food chain

## 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 the recycling company

**Contaminated Packaging:**

Neither a container nor packaging is contaminated during normal use. When internal materials leak from a battery cell, packaging can become contaminated, dispose of it as industrial wastes which is subject to special control.

## SECTION 14. TRANSPORT INFORMATION

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 there is no leakage coming from the container. Do not drop, break or damage cargo. Prevent cargo piles from possible collapse by keeping them dry and protected from rain The container must be handled carefully. Do not hit the container which may damage the battery. When packaging the batteries, ensure they will not be shorted during shipping.
Section - 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)
- Mercury-containing and Rechargeable Battery Management Act (USA)
- 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

- This Safety Data Sheet provides guidance on health, safety and environmental aspect of the product and should not be constructed 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 Education (NITE)