



MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION Cylindrical Nickel Cadmium Battery
Part Numbers - 404717 & 402500

DISTRIBUTOR IDENTIFICATION

Company Name Paslode
Address 888 Forest Edge Drive
 Vernon Hills, Illinois 60061-3105
Telephone 847-634-1900
Emergency Contact CHEMTREC
Emergency Telephone 800-424-9300

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SECTION 2 - HAZARDS IDENTIFICATION

Most Important Hazard and Effects

For 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 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 an eye, the cornea may be affected and it may lead to blindness.

Ingestion:

The electrolyte ingestion 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 throw it out into the environment.

Specific Hazards:

As previously described.

SECTION 3 - COMPOSITION / INFORMATION ON 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
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%	-
Potassium Hydroxide	1310-58-3	0-5%	Acute Toxicity
Sodium Hydroxide	1310-73-2		Corrosivity
Lithium Hydroxide	1310-65-2		Irritant Property

SECTION 4 - FIRST-AID MEASURES

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 flammable, in case of fire, move it to a 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:

Acrid 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 following:

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. 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 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 terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by Paslode.

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 / 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 Generic Name	ACGIH (2007)	
	TLV-TWA	BEI
Nickel, Nickel Compounds	(As Ni) Metal: 1.5mg/m ³ Soluble Compounds: 0.1mg/m ³	-

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	Insoluble Compounds: 0.2mg/m ³	
Cadmium, Cadmium Compounds	(As Cd) Simple Substance: 0.01mg/m ³ Compounds: 0.002mg/m ³	In Urine: 5 micro g/l In blood: 5 micro g/l
Cobalt Compounds	(As Co) 0.02mg/m ³	In Urine: 15 micro g/l In blood: 1 micro g/l
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 sleeves and long trousers

A battery cell is not applied to Toxic Substances Control Act (TSCA), 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)

Odour: No odour

pH: NA

Specific temperatures/temperature ranges at which changes in physical state occur:

There is no useful information for the product as a mixture.

Flashpoint: NA

Explosion Properties: NA

Density: about 2.4~4.0g/cm³

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 Condition:

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) A5 - 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 Possibly carcinogenic to human.
IARC: (Compounds) Group 1 Carcinogenic to human.

Reproduction Toxicity:

GHS: It is not possible to classify 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 sensitization: Unknown

Germline mutagenicity:

GHS; Category 2
The hereditary disorder might be caused.

Carcinogenicity:

GHS: Category 1A
ACGIH: A2 - Suspected human carcinogen.
NIOSH: Potential occupational carcinogen.

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NTP: Known to be 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):

Category 1
The disorder of the kidney, lungs, blood, bone and 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 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: Unknown

Carcinogenicity:

GHS: Category 2
ACGIH: A3 - Confirmed animal carcinogen but relevance to human carcinogen is unknown.
IARC: Group 2B Possibly 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.

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

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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 Possibly carcinogenic to human.
The cancer might be caused.
Reproduction toxicity: Unknown
Certain target organ/Systemic toxicity (single exposure): Unknown
Certain target organ/Systemic toxicity (repeated exposure):
GHS: Category 1
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 sensitization:
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
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.
Inhalation (gas) GHS: out of category.
Inhalation (steam) Unknown
Inhalation (dust) Unknown
Skin corrosivity: GHS: Category 1
Serious chemical wound of the 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 sensitization:
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):

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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 Unknown

Inhalation (steam) Unknown

Inhalation (dust) GHS: Category 3. Harmful if inhaled.

Skin corrosivity: GHS: Category 1
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 sensitization:

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
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 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 through the recycling company.

Contaminated Packaging:

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates them, dispose them as industrial wastes subject to special control.

SECTION 14 - TRANSPORT INFORMATION

Product: Paslode® Batteries - 404717 & 402500

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. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Moreover, take the protection measures not short-circuited. Please refer to Section 7 - HANDLING AND STORAGE also.

SECTION 15 - REGULATORY INFORMATION

Regulations Specifically Applicable to the Product:

Wastes 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 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 of Occupational Safety and Health (NIOSH)

The Ninth Report of 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)

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