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Reference number CA-CE-E01-16

Safety data sheet for chemical products (SDS)

1.PRODUCT AND COMPANY IDENTIFICATION

- Product name : Nickel Cadmium Battery
- Company name : Automotive & Industrial Systems Company of Panasonic Group
  SANYO Electric Co., Ltd. Portable Rechargeable Battery Business Division
- Address : 222-1, kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number : +81-799-24-4111
- Telefax number : +81-799-23-2995
- Emergency telephone number : [Weekday] +81-799-23-2881
  [Night and holiday] +81-799-24-4131

2.HAZARDS IDENTIFICATION

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 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.

- Most important hazard and effects

Human health effects:

Inhalation: The electrolyte inhalation affects the respiratory tract membrane and the lugs. 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 out it into the environment.

- Specific hazards :

As previously described.

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 labelling
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 corrosivity irritant property
Sodium Hydroxide	1310-73-2		
Lithium Hydroxide	1310-65-2		

Cadmium corresponds to the Substance of Very High Concern (SVHC) of REACH regulation.

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.
- 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.

5.FIRE-FIGHTING MEASURE

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: Acrid or harmful fume is emitted during fire.
- Special protective equipment for firefighters : Protective equipment written in Section 8.

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. The leaked solid is moved to a container. The leaked place is fully flushed with water.

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 Sanyo.
- 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.

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 / General name	ACGIH(2014)	
	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	-
Cadmium,Cadmium Compounds	(As Cd) Simple substance : 0.01mg/m^3 Compounds : 0.002mg/m^3	In urine : 5 micro g/g 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	3mg/m^3	-
Potassium Hydroxide	-	-
Sodium Hydroxide	-	-
Lithium Hydroxide	0.025mg/m^3	-

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

・A battery cell is not applied to Toxic Substances Control Act (TSCA), because it is not a chemical substance but an article.

9.PHYSICAL AND CHEMICAL PROPERTIES

・Appearance

Physical state: Solid
Form: Cylindrical
Color: Metallic color (without tube)
Odor: No odor

・pH : NA

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

・Flash point : NA

・Explosion properties : NA

・Density : about 2.4～4.0g/cm^3

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

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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 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.

11.TOXICOLOGICAL INFORMATION

There is no data available on the product itself.
（in case of electrolyte leakage from the battery）

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
  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
  The disorder of the kidney, lungs, blood, bone, and respiratory organ is caused by long-term or repeated 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.

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.

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 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.

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 INSTRUCTINS 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)

However, it is necessary to obey the IATA Dangerous Goods Regulations(A123).

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. Take the protection measures not short-circuited.
Moreover, do not damage or remove the external tube. Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water and seawater. Never disassemble, modify or deform. Avoid direct sunlight, high temperature, high humidity.

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/EC (EU)
Regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (EU)

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)
2014 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)
Dangerous Goods Regulations – 56th Edition Effective 1 January 2015: International Air Transport Association (IATA)

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