

HOWELL ENERGY CO., LTD.

B1010, Genzon Times Square, Longgang center, Shenzhen, China

Tel: (86)-755 89335456 Fax: (86)-755-89335457 MSDS NO:20210102

MATERIAL SAFETY DATA SHEET

1. Product & company identification

1.1 Company identification

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Date of Preparation: Jan.2, 2021

1.2 Product Identification

Product Name: Dry Battery (NI-Cd)

Trade Name: HOWELL or neutral or OEM brands

Chemical System: Nickel Cadium Designated for Recharge: Yes No

2. Hazards identification

IMPORTANT NOTE: The battery cell is contained in a hermetically sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances. The following information is provided for the user's information only.

3. Composition/information

Chemical Name	CAS No.	OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)
Separator	1344-28-1	About 1% weight	
Metal components	7439-89-6	About 15% weight	
Expanded Copper Net	7440-50-8	About 6% weight	Pure metal
Hydrogen Storage Alloy	1313-99-1	About 30% weight	Alloy
Nickel (foam)	7440-02-0	About 8% weight	Pure metal
Nickel Hydroxide	12054-48-7	About 38% weight	1 TWA
Cobalt	7440-48-4	About 2% weight	Dust & Fume 0.005
Lanthanum	7439-91-0	NA	NA
Cerium	7440-45-1	NA	NA
Neodymium	7440-00-8	NA	NA

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Potassium hydroxide	1310-58-3	NA	2 Ceiling Limit
Lithium hydroxide	1310-65-2	NA	NA

Notes: 1. TWA is the time weighted average concentration over an 8-hour period.

4. Emergency and First Aid Procedures:

Swallowing: Do not induce vomiting. Seek medical attention immediately.

Skin: If the internal cell materials of an opened battery cell come into contact with the skin, immediately flush with water for at least 15 minutes.

Inhalation: If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

Eyes: If the contents from an opened battery come into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

5. Firefighting measures

If fire or explosion occurs when batteries are on charge, shut off power to charger.

In case of fire where nickel Cadmium 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 Cadmium 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 Cadmium 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.

Fire fighters should wear self-contained breathing apparatus. Burning nickel Cadmium batteries can produce toxic fumes including oxides of nickel, cobalt, aluminum, manganese, lanthanum, cerium, neodymium, and praseodymium.

Special Fire Fighting Procedures: Exposure to temperatures of above 21.2°C can cause venting of the liquid electrolyte. Internal shorting could also cause venting of the electrolyte. There is potential for exposure to iron, nickel, cobalt, rare earth metals (cerium, lanthanum neodymium, and praseodymium), manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

6 Spill and Leak Procedures

Spill and leaks are unlikely because cells are contained in a hermetically-sealed case. If the battery case is breached, don protective clothing that is impervious to caustic materials and absorb or pack spill residues in inert material. Dispose in accordance with applicable state and federal regulations.

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7. Precautions for Safe Handling and Use

Storage: Store in a cool place, but prevent condensation on cell or battery terminals. Elevated temperatures may result in reduced battery life. Optimum storage temperatures are between -31°F and 95°F.

Mechanical Containment: If there are special encapsulation or sealing requirements, consult your Howell Energy Co., Ltd. representative about possible cell hazard precautions or limitations.

Handling: Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case. Batteries packaged in bulk containers should not be shaken. Metal covered tables or belts used for assembly of batteries into devices can be the source of short circuits; apply insulating material to assembly work surface. If soldering or welding to the case of the battery is required, consult Howell Energy Co., Ltd. representative for proper precautions to prevent seal damage or external short circuit.

Charging: This battery is designed for recharging. A loss of voltage and capacity of batteries due to self-discharge during prolonged storage is unavoidable. Charge battery before use. Observe the specified charge rate since higher rates can cause a rise in internal gas pressure that may result in damaging heat generation or cell rupture and/or venting.

Labeling: If normal label warnings are not visible, it is important to provide a device label stating:

CAUTION: Do not dispose in fire, mix with other battery types, charge above specified rate, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

8. Safe Handling and Use (Personal Protective Equipment)

Ventilation Requirements: Not required under normal use.

Respiratory Protection: Not required under normal use.

Eye Protection: Not required under normal use.

Gloves: Not required under normal use.

9. Physical Data for Battery

Melting point (°F)	Boiling point (°F)	% Volatile by Volume
NA	NA	NA

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Vapor Pressure (mm Hg) NA	Evaporation Rate	Vapor Density (Air = 1) NA
Specific Gravity (H ₂ O) NA	Solubility in Water NA	Appearance and Odor No Odor

10. Reactivity Data

The batteries are stable under normal operating conditions.

Hazardous polymerization will not occur.

Hazardous decomposition products: oxides of nickel, cobalt, manganese, lanthanum, and cerium.

Conditions to avoid: heat, open flames, sparks, and moisture.

Potential incompatibilities (i.e., materials to avoid contact with): The battery cells are encased in a non-reactive container; however, if the container is breached, avoid contact of internal battery components with acids, aldehydes, and carbamate compounds.

11. Health Hazard Data

Threshold Limit Values: See Section II

Effects of a Single (Acute) Overexposure:

Inhalation: During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach in the battery cell case, exposure to the constituents may occur. Inhalation of cobalt dusts may result in pulmonary conditions.

Ingestion: If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.

Skin Absorption: No evidence of adverse effects from available data.

Skin Contact: Exposure to the electrolyte contained inside the battery may result in chemical burns. Exposure to nickel may cause dermatitis in some sensitive individuals.

Eye Contact: Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

Carcinogenicity:

Nickel has been identified by the National Toxicology Program (NTP) as reasonably anticipated to be

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a carcinogen. Cobalt has been identified by IARC as a 2B carcinogen.

Other Effects of Repeated (Chronic) Exposure:

Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.

Medical Conditions Aggravated by Overexposure:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

12. Fire and Explosion Hazard Data

Flash Point: NA

Lower Explosive Limit: NA

Upper Explosive Limit: NA

Extinguishing Media: Any class of extinguishing medium may be used on the batteries or their packing material.

Special Fire Fighting Procedures: Exposure to temperatures of above 21.2°C can cause venting of the liquid electrolyte. Internal shorting could also cause venting of the electrolyte. There is potential for exposure to iron, nickel, cobalt, rare earth metals (cerium, lanthanum neodymium, and praseodymium), manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

13. Recycling and Disposal

Howell encourages battery recycling. Our Nickel Cadmium batteries are not defined by the local government as hazardous waste and are safe for disposal in the normal municipal waste stream. DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F. Such treatment can cause cell rupture.

14. Transportation

Howell are considered to be "Dry cell" batteries and are unregulated for purpose of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and International Maritime Dangerous Goods Regulations (IMDG). The only DOT requirement for shipping Nickel Cadmium 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

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batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting. The goods is non-hazardous materials for SEA transportation. The consignment is fully described by SEA. The batteries passed the inspection of special provision 130. And the consignment is not classified as dangerous under and already comply with the current edition of the IMDG regulations and SP304. Such batteries have been packed in inner packing in such a manner as to effectively prevent from short circuits and the movements which could lead to short circuit. And it passes the special provision A123. The consignment is no classified as dangerous under current edition of the DG regulation 2012 – SP A123. Must comply with packing instruction of IATA DGR 62th Edition 2021

15. Regulatory Information

Howell sealed Nickel Cadium 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).

16. Other information

More information concerning shipping, testing, marking and packaging can be obtained from Howell Energy Co., Ltd. representatives.

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