Section 1 - Product and Company Identification

Manufactured For:
MOHR Test and Measurement, LLC
2105 Henderson Loop
Richland, WA 99354 USA
Phone Number: 1-888-852-0408

Product Name: Nickel-Metal Hydride Battery
Generic Name: Battery Pack
Part No: CT100-AC-B2700

Recommended Use:
For powering the CT100B TDR Cable Analyzer

Restrictions on Use:
It is not intended for use with other products.

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 a fire, added mechanical shocks, decomposed, and/or added electric stress by misuse, the gas release vent will be operated. The battery cell case may be breached. Hazardous materials may be released.

Moreover, if heated strongly by the surrounding fire, acrid or harmful fumes may be emitted.

Human health effects:

- Inhalation: Electrolyte inhalation affects the respiratory tract membrane and the lungs. Fumes may cause a cough, chest pain, and dyspnea. Bronchitis and pneumonia may occur. Fumes could be a carcinogen.
- Skin contact: Electrolyte skin contact seriously affects the skin and may cause dermatitis.
- Eye contact: Electrolyte leaked from the battery cell is a strong alkali. When it goes into an eye, the cornea may be affected and it may lead to blindness.
- Ingestion: Electrolyte ingestion seriously irritates the mouth and the throat, resulting in vomiting, nausea, hematemesis, stomach pains, and diarrhea.
- Environmental effects: Since a battery cell remains in the environment, please recycle. Do not throw out or bury.

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
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	7440-02-0	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 Measures

Internal cell materials of an opened battery cell

Inhalation:

Cover the victim in a blanket, move them to a place with fresh air, and keep them quiet. Seek medical attention immediately. In cases of 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 fumes are emitted during fire.
- Special protective equipment for firefighters: Protective equipment is described 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 persons to enter. Remove leaked materials with protective equipment described 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. Flush location of leak 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 drop. Never disassemble, modify, or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, only use dedicated charger or charge according to the conditions specified by MOHR.

Storage

Technical measures

- Storage conditions (suitable to be avoided): Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature: -20°C to 30°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 / 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 (2011)	
	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) 1mg/m^3 (Flammable powder)	-
Zinc Oxide	2mg/m^3	-
Carbon Black	3mg/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: Work clothes with long sleeves 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: 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: Around 1.5 ~ 6.0g/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 combust. When a battery cell is heated strongly by the surrounding fire, acrid or harmful fumes 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 fumes are 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. Might cause allergies, asthma, or breathing difficulties if inhaled.
  Skin sensitization: GHS: Category 1. Might cause allergic skin reaction.
- 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
  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 humans
  IARC: (Compounds) Group 1 – Carcinogenic to humans
- Reproductive toxicity: GHS: It is not possible to classify it due to data deficiency.
- Specific target organ toxicity (single exposure): GHS: Category 1 (lungs and kidneys). Causes damage to the lungs and kidneys.
- Specific target organ toxicity (repeated exposure): GHS: Category 1 (lungs). Causes damage to the lungs with 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 sensitization:
  Respiratory sensitization: GHS: Category 1. Might cause allergies, asthma, or breathing difficulties if inhaled.

Skin sensitization: GHS: Category 1. Might cause allergic skin reaction.

- Germline mutagenicity: Unknown
- Carcinogenicity:
  GHS: Category 2
  ACGIH: A3 – Confirmed animal carcinogen with unknown relevance to humans.
  IARC: Group 2B – Possibly carcinogenic to humans
- Reproductive toxicity: GHS: Category 2. Adverse effects on reproductive competence or a fetus might occur.
- Specific target organ toxicity (single exposure): GHS: Category 3 (respiratory tract irritating properties). Might irritate the respiratory tract and lungs.
- Specific target organ toxicity (repeated exposure): GHS: Category 1 (lungs). Causes damage to lungs with long-term or repeated exposure.

Manganese compounds

- Acute toxicity:
  Oral: GHS: out of category
  Skin: Unknown.
  Inhalation (gas) GHS: exempt from a classification
  Inhalation (steam, mist): Unknown
- Skin corrosivity: GHS: Category 3. Slight skin irritation.
- Serious damage and irritant property for eyes: GHS: Category 2B. Eye irritation.
- Respiratory or skin sensitization:
  Respiratory sensitization: Unknown
  Skin sensitization: Unknown
- Germline mutagenicity: GHS: It is not possible to classify.
- Carcinogenicity: GHS: out of category
- Reproductive toxicity: GHS: Category 1B. Adverse effects on reproductive competence or a fetus might occur.
- Specific target organ toxicity (single exposure): GHS: Category 1 (lungs). Causes damage to lungs.
- Specific target organ toxicity (repeated exposure): GHS: Category 1 (lungs, nervous system). Causes damage to lungs and nervous system with long-term or repeated inhalation exposure.

Aluminum Compounds

- Acute toxicity:
  Oral, skin, inhalation (steam, 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: Unknown
- Reproductive toxicity: Unknown
- Specific target organ toxicity (single exposure): Unknown
- Specific target organ toxicity (repeated exposure):
  GHS: Category 1 and 2
  Damage to the pulmonary system is caused by long-term or repeated inhalation exposure. (Category 1)
  Nervous system damage might be caused by long-term or repeated oral exposure. (Category 2)

Zinc oxide

- Acute toxicity:
  Oral: rat LD50 > 5000mg/kg
  Inhalation (dust, mist): rat LC50 > 5.7mg/l. Harm 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 sensitization:
  Respiratory sensitization: Unknown
  Skin sensitization: GHS: out of category
- Germline mutagenicity: Unknown
- Carcinogenicity: GHS: out of category
- Reproductive toxicity: GHS: out of category
- Specific target organ toxicity (single exposure): GHS: Category 1. Can cause symptoms throughout the body.
- Specific target organ toxicity (repeated exposure): GHS: Category 1. Damage to the pulmonary system is caused by long-term or repeated inhalation 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.
  Skin sensitization: Unknown.
- Germline mutagenicity: Unknown.
- Carcinogenicity:
  GHS: Category 2
  ACGIH: A3 – Confirmed animal carcinogen with unknown relevance to humans.
  IARC: Group 2B – Possibly carcinogenic to humans
- Reproductive toxicity: Unknown
- Specific target organ toxicity (single exposure): Unknown
- Specific target organ toxicity (repeated exposure): GHS: Category 1. Damage to the pulmonary system 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. Causes serious chemical skin wounds and eye damage.
- Serious damage and irritant property for eyes: GHS: Category 1. Causes serious damage to eyes.
- 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.
- Reproductive toxicity: GHS: It is not possible to classify.
- Specific target organ toxicity (single exposure): GHS: Category 1. Causes damage to the respiratory system.
- Specific target organ 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. Causes serious chemical skin wounds and eye damage.
- Serious damage and irritant property for eyes: GHS: Category 1. Causes serious damage to eyes.
- 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.
- Reproductive toxicity: GHS: It is not possible to classify.
- Specific target organ toxicity (single exposure): GHS: Category 1 (respiratory system). Causes damage to lungs.
- Specific target organ 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. Causes serious chemical skin wounds and eye damage.
- Serious damage and irritant property for eyes: GHS: Category 1. Causes serious damage to eyes.
- 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
- Reproductive toxicity: Unknown
- Specific target organ toxicity (single exposure): GHS: Category 1. Respiratory system damage is caused by inhalation exposure.
- Specific target organ toxicity (repeated exposure): GHS: Category 1 and 2. Damage to the respiratory system is caused by long-term or repeated inhalation exposure. Might cause damage to the liver and the hematopoietic system with long-term or repeated oral exposure.

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. Please recycle.

Section 13 - Disposal Considerations

Recommended methods for safe and environmentally preferred disposal:
- Product (waste from residue)
  Do not throw out a used battery cell. Recycle it through a recycling company.
- Contaminated packaging
  Neither a container nor packaging is contaminated through normal use. If internal materials leaked from a battery cell contaminate containers or packaging, dispose of them as industrial wastes subject to special control.

Section 14 - Transport Information

This battery **does not require** the following items.
- Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO)
- IATA Dangerous Goods Regulations (IATA)
- Code of federal regulations (U.S. DOT)

This battery **requires** the following items.

- International Maritime Dangerous Goods Code (IMO)

From January 1, 2012, Nickel-Metal Hydride Batteries are classed as Dangerous Goods, Class 9 in accordance with United Nations Recommendations on the Transport of Dangerous Goods and will have the following UN Number:

UN No.	Proper shipping name	Class or division	Packing group	Special provisions
3496	BATTERIES, NICKEL-METAL HYDRIDE	9	–	117 963

Instructions and contents of Special Provisions (117 and 963) for this UN number include:

- Specifying it is only regulated when transported by sea.
- Ni-MH button cells are not subject to the provisions of this code.
- Ni-MH cells or batteries packed with or contained in equipment are not subject to the provisions of this code.
- All other Ni-MH cells or batteries shall be securely packed and protected from short circuit. They are not subject to other provisions of this code provided they are loaded in a cargo transport unit in a total quantity of less than 100 Kg gross mass.

When loaded in a cargo transport unit in a total quantity of 100 Kg gross mass or more, only subject to:

- Provided dangerous goods transportation information by a) Consignor and b) Shipper.
- Stowage and segregation provisions: as prescribed in Chapter 3 of IMDG Code: “away from” sources of heat at minimum horizontal separation of 3 meters.

Prior to transportation, confirmation that there is no leakage and no spillage from a container is necessary. Cargo must be handled without falling, dropping, or breakage. Care must be taken to prevent the collapse of cargo piles or saturation by rain. Containers must be handled carefully. Packaging is constructed to prevent short-circuiting and/or electric shock. The product is handled as Non-Dangerous Goods based on IATA (A123) for air shipment.

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)
- Commission Directive 2006/66/EU (EU)

Other regulations local to the place of use may apply.

Section 16 - Other Information

The information contained in this safety datasheet is based on the present state of knowledge and current legislation.

This safety datasheet 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)
2011 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 Labelling of Chemicals (GHS)
National Institute of Technology and Evaluation (NITE)