



**MATERIAL SAFETY DATA SHEET**  
**PRODUCT NAME: NICKEL-CADMIUM SEALED CELL BATTERY**

**Note: Saft Nickel-Cadmium batteries are exempt articles and are not subject to the OSHA Hazard Communication regulation. Saft Nickel-Cadmium batteries do not pose a physical or health risk to the user under normal use conditions. This MSDS is provided as a service to our customers.**

<b>SAFT AMERICA Inc.</b> 711 Industrial Blvd. Valdosta, GA 31601 Information: Phone 912-247-2331 Fax 912-245-2880	<b>For Chemical Emergency</b> Spill, Leak, Fire, Exposure or Accident Call CHEMTREC - Day or Night 800-424-9300
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SAFT BRAND Ni-Cd SEALED CELLS AND SEALED CELL BATTERY PACKS

### 1. HEALTH HAZARD INFORMATION

**NOTE: Ni-Cd sealed cells are hermetically sealed units and do not expose users to hazardous constituents and are not chemically dangerous under normal conditions of use. The toxic properties of the electrolyte and electrode materials contained inside the steel can are hazardous only if the materials are released by mechanically damaging the cell or if exposed to fire.**

<b>Effects of Overexposure:</b>	
<b>Eye Effects:</b>	Contact with electrolyte solution contained inside the cell casing causes very rapid, severe damage. Extremely corrosive to eye tissues. May result in permanent blindness.
<b>Skin Effects:</b>	Contact with electrolyte solution inside battery may cause serious burns to skin tissues. Contact with nickel compounds may cause skin sensitization, resulting in chronic eczema or nickel itch.
<b>Ingestion:</b>	Ingestion of electrolyte solution causes tissue damage to throat area and gastro/respiratory tract. Ingestion of cadmium and/or nickel compounds causes nausea and intestinal disorders.
<b>Inhalation:</b>	Electrolyte is corrosive and will cause severe respiratory tract irritation if inhaled. Nickel and cadmium compounds contained inside the cell container should be treated as carcinogens.
<b>Carcinogenicity:</b>	NIOSH recommends that nickel and cadmium be treated as occupational carcinogens.

### 2. EMERGENCY FIRST AID (not anticipated under normal use)

<b>Battery Electrolyte</b>	
<b>Eye Contact:</b>	Flush with plenty of water for at least 20 minutes. Get immediate medical attention.
<b>Skin Contact:</b>	Remove contaminated clothing and flush affected areas with plenty of water for at least 20 minutes.
<b>Ingestion:</b>	Do not induce vomiting. Dilute by giving large volumes of water or milk. Get immediate medical attention. Do not give anything by mouth to an unconscious person.
<b>Inhalation:</b>	Remove to fresh air. Give oxygen or artificial respiration if needed. Get immediate medical attention.
<b>Nickel and Cadmium</b>	
<b>Skin contact:</b>	Wash with cold water and soap.

### 3. SPECIAL PROTECTION INFORMATION (not needed under normal use)

<b>Respiratory Protection:</b> Not needed under conditions of normal use.
<b>Eye Protection:</b> Not needed under conditions of normal use.
<b>Hand Protection:</b> Not needed under conditions of normal use. If exposure to electrolyte solution (wet or dried) is likely, handle with non-permeable gloves, i.e., latex, nitrile.
<b>Other protective Equipment:</b> Not needed under normal conditions of use.

### 4. REACTIVITY DATA (Ni-Cd cells are stable under normal storage and use conditions)

<b>Incompatibilities:</b> Electrolyte contained inside the seal can is incompatible with aluminum, zinc, tin and other active metals, acid, chlorinated and aromatic hydrocarbons, nitrocarbons, halocarbons. Trichloroethylene will react with electrolyte solution to form dichloroacetylene which is spontaneously combustible.
<b>Hazardous Decomposition Products:</b> Nickel compounds, cadmium compounds, and potassium hydroxide.
<b>Note that normal reactions inside battery liberate flammable hydrogen gas. Hazardous Polymerization will not occur.</b>

## 5. FIRE AND EXPLOSION HAZARDS (not anticipated under normal use)

### Special Fire Fighting Procedures

If Ni-Cd sealed cells are involved in a fire, use self-contained breathing apparatus to avoid breathing toxic fumes. If cells are broken open, wear protective clothing and equipment to prevent potential body contact with electrolyte or mixture of water and electrolyte solution. Disconnect or cut all wiring to and from battery.

**Extinguishing Media:** CO<sub>2</sub>, Class C Dry Chemical, Sand

CO<sub>2</sub> extinguishers are desired by some users because they don't leave a corrosive residue. Some users prefer Class C dry chemical extinguishers because they leave a non-flammable coating on the extinguished material, reducing the likelihood of re-ignition. However, these coatings are typically corrosive and can damage sensitive electrical equipment.

Material/Compound	Melting Point	Boiling Point
Cadmium	608°F	1410°F
Cadmium Hydroxide	N/A	2838°F (sublimes)
Nickel	2645°F	4950°F
Nickel Hydroxide	N/A	445°F (Decomposes to NiO)

### Fire and Explosion Hazards

Electrolyte (potassium hydroxide) is corrosive to all human tissues. It will react violently with many organic chemicals, especially nitrocarbons and chlorocarbons. Electrolyte reacts with zinc, aluminum, tin and other active materials releasing flammable hydrogen gas.

Cadmium fumes may be released when batteries are subjected to high temperatures and break open. In case of fire, do not breathe smoke and fumes!

## 6.0 INGREDIENTS

	CAS#	EXPOSURE LIMITS	QUANTITY
Cadmium (as Cadmium and Cadmium Hydroxide)	7440-43-9 21041-95-2	5.0 mcg/m <sup>3</sup> dust – OSHA 0.05 mg/m <sup>3</sup> ACGIH CEILING-Fume	≈ 17%
Nickel ( as Nickel and Nickel Hydroxide)	7440-02-0 1205-44-87	1 mg/m <sup>3</sup> – OSHA	≈ 19%
Electrolyte Solution (18-28% potassium hydroxide)	1310-58-3	2 mg/m <sup>3</sup> ACGIH CEILING-Air	≈ 8%
Cobalt (as Cobalt Hydroxide)	7440-48-4	0.1 mg/m <sup>3</sup> – OSHA	≈ 1%
Steel		None Established – OSHA	≈ 9%

## 7. PHYSICAL PROPERTIES

Boiling Point -	Not Applicable	Melting Point -	Not applicable
Vapor Pressure -	Not Applicable	Vapor Density -	Not applicable
Specific Gravity -	Not Applicable	Evaporation Rate -	Not Applicable
Solubility in Water -	Not Applicable		

## 8. SPILL MANAGEMENT PROCEDURES

Spills will not occur even when cells are broken open and the internal components are exposed.

Ni-Cd sealed cell batteries are dry cell batteries and do not contain free electrolyte.

## 9. DISPOSAL INFORMATION

Spent batteries are Universal Wastes under RCRA.

**Never incinerate Ni-Cd batteries. Never dispose Ni-Cd batteries as landfill. Nickel-cadmium batteries can be fully recycled and may be returned to SAFT for recycling free of charge.**

Ni-Cd batteries are TCLP Toxic. The electrolyte inside the cell can be corrosive. If not recycled, must be disposed of in accordance with all federal, state, and local hazardous waste regulations.

## 10. PRECAUTIONS AND COMMENTS

These batteries may be highly charged and are capable of high energy discharge. Care should be taken to handle batteries properly to avoid shorting or misuse that will result in a rapid, uncontrolled electrical, chemical, or heat energy release. Ship in accordance with DOT Special Provision 130.

Do not short circuit – may cause burns or fire.

When removing battery from service, visually inspect for leakage prior to handling. If leakage has occurred follow Spill Management Procedures.

Do not allow an exposed flame or spark to come near the cells.

## 11. EPCRA REPORTING REQUIREMENTS

Section 313 Supplier Notification – This product contains the following EPCRA Section 313 chemicals subject to the reporting requirements of Section 313 if the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372):

<u>CAS #</u>	<u>Chemical Name</u>	<u>Percent by Weight</u>
7440-43-9	Cadmium	17%
7440-48-4	Cobalt	1%
7440-02-0	Nickel	19%

A copy of this MSDS may be required to be filed with local emergency planning commissions, state emergency response commissions, and local fire departments in accordance with sections of the Emergency Planning and Community Right-To-Know Act.

## 12. TRANSPORTATION INFORMATION

Soft sealed Nickel-Cadmium batteries are classified as "dry cell" batteries and are unregulated for purposes of transportation under the regulations of the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO), International Air Transport Association (IATA) and the International Maritime Organization (IMO). These batteries are subject to the shipping requirements of DOT Special Provision 130 which states: "Batteries, dry are not subject to the requirements of this subchapter only when offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals)."

The only requirements for shipping these batteries by ICAO and IATA is Special Provision A123 which states: "An electrical battery of battery-powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation."

The International Maritime Dangerous Goods Code (IMDG) regulates them for ocean transportation under Special Provision 304 which states: "Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits."

Examples of dry batteries are: alkaline-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries.

Last Date Revised: 03/09/2012

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