


Originating DCR		47456		REVISIONS	
REV	DESCRIPTION			DATE	APPROVED
P	Revised per DCR 54251 7/12/99 BY			7/12/99	BB
Q	Revised Safety Sheets and Obsolete Old Sheets per DCR 55678 7/2/03 DM			8/25/03	BB
R	Updated Battery MSDS to standard ANSI format per DCR 56456			02/18/05	BB
T	Remove reference to UN2800 in section 14 of MSDS per DCR 56484			03/11/05	BB
U	Correct Emergency Phone Number on MSDS per DCR 56538			5/2/05	BB
V	Change Revision Date on MSDS Sheets per DCR 57477			03/21/08	BB
W	Revised Per DCR 58143 Add Hazard Ratings and added HMIS to Key Legend. CLW 03/16/10			03/24/10	BB
Y	Revised Per DCR 59016, Add Check Box for Review; and date was Mar 16, 2010 ATH 03/21/13			3/26/13	GC
AA	Revised Per DCR 59437, Converted from MSDS to SDS			10/31/14	JV
AB	Revised Per DCR 59619, Remove UN numbers, insert Product Composition %			2/24/15	JV
AC	Revised Per DCR 59846, Updated format			10/19/15	

## REFERENCE SPECIFICATION

				<b>MarathonNorco Aerospace, Inc.</b>				
APPROVALS		DATE		WACO, TEXAS				
ORIGINATOR LFL		07/08/88		SAFETY DATA SHEETS				
CHECKED								
APPROVED GHV		05/20/97		SIZE	FSCM	DWG NO	REV	AC
DIST. CODE		14A		A	74025	RS-95112		
								SHEET 1 OF 9



# SAFETY DATA SHEET

This SDS complies with REACH 1907/2006 and 2001/58/EC, GHS, OSHA 29CFR 1910.1200

## Section 1: Chemical Product and Company Identification

MANUFACTURER'S NAME  
Marathon Norco Aerospace, Inc.  
8301 Imperial Drive  
Waco, Texas 76712-6588

EMERGENCY TELEPHONE  
Chemtrec U.S.-Canada: 800-424-9300  
Chemtrec International: 703-527-3887  
Information: 254-776-0650  
Fax: 254-776-6558  
Charles Vonasek: [cvonasek@mptc.com](mailto:cvonasek@mptc.com)

Safety Data Sheet Competent Person:

DATE PREPARED: February 20, 2014

**REVISION DATE: October 19, 2015**

PRODUCT NAME: **NICKEL CADMIUM BATTERY**  
FORMULA: Preparation/Mixture  
PRODUCT USE: Battery

## Section 2: Hazards Identification

Regulation (EC) No 1272/2008



GHS Hazard Class

Carcinogenicity—Category 1  
Reproductive –Category 1B  
Mutagenic – Category 2  
Eye Irritation -- Category 1  
Acute Toxicity – Category 2  
Aquatic Acute Hazard – Category 1

Signal word:  
Hazard Statement:

Danger  
May cause cancer (Nickel and Cadmium).  
Causes serious eye damage.  
Fatal if inhaled.

Prevention

Very toxic to aquatic life.  
May damage fertility or the unborn child.  
Suspected of causing genetic defects.  
Obtain special instruction before use.  
Do not handle until all safety precautions have been read and understood.  
Use personal protective equipment as required.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Do not breathing dust/fumes/gas/mist/vapors/spray.  
Use only outdoors or in a well-ventilated area.  
Wear respiratory protection.

Response

Avoid release to the environment.  
Obtain special instructions before use.  
If exposed or concerned: Get medical attention/advice.  
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Immediately call a POISON CENTER or doctor/physician.  
If Inhaled: Remove victim to fresh air and keep at rest in a position conformable for breathing.  
Specific treatment is urgent.

Storage

Collect spillage.  
Store in a cool, dry place.  
Store in a well ventilated place. Keep container closed.

Disposal

Follow the waste disposal requirements of your country, state, or local authorities.  
No Precautionary statement.  
Dispose of contents/container in accordance with the waste disposal requirements of your country, state, or local authorities. Do not dispose of in a landfill.

Sealed Battery Cells are NOT a regulated material when used in the as sold condition. Should the outside cell case be opened or damaged, there may be exposure to cadmium (Cd), cadmium compounds, and nickel hydroxide (Ni(OH)2). These constituents of the battery cell assembly are regulated.

HAZARD CLASSIFICATION: Classified as a hazardous material based on IATA, IMDG, and DOT.



**FIRE AND EXPLOSION:** Under normal conditions the battery cells are nonflammable. At elevated temperatures in a fire situation the cells may emit cadmium fumes and electrolyte.

**POTENTIAL HEALTH EFFECTS:**

**INGESTION:** Vapors, mists, and liquid are extremely corrosive to the mouth and throat. Swallowing the liquid burns the tissues and causes severe abdominal pain, nausea, vomiting and collapse.

**INHALATION:** Vapors and mists are extremely corrosive to the nose, throat and mucous membranes. Bronchitis, pulmonary edema and chemical pneumonitis may occur. Irritation, coughing, chest pain and difficulty in breathing may occur with brief exposure. Prolonged exposure may result in more severe irritation and tissue damage. If exposed to an open cell, wear a MSHA/NIOSH approved dust/mist respirator.

**SKIN CONTACT:** Vapors, mists and liquid are extremely corrosive to the skin. Vapors will severely irritate the skin and mists and liquid will severely burn the skin. Prolonged contact of the liquid will burn or destroy surrounding tissue.

**EYE CONTACT:** Vapors, mists and liquid are extremely corrosive to the eyes. Brief contact of the vapors will be severely irritating. Brief contact of the liquid will severely damage the eyes and prolonged contact may cause permanent eye injury, which may be followed by blindness.

**OTHER:** When charged these batteries may be highly active and capable of large and rapid generation of electrical energy. Care should be taken to handle cells properly to avoid shorting or misuse that will result in rapid and uncontrolled generation of electrical, chemical or heat energy.

**CHRONIC EFFECTS OF OVEREXPOSURE:** Chronic Effects of Exposure; May result in areas of destruction of skin tissue or primary irritant dermatitis. Inhalation of vapors and mists may cause varying degrees of damage to the affected tissue and also increasing susceptibility to respiratory illness.

**APPEARANCE:** Liquid contained inside a cell or package.

**NFPA Rating:**

Component	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
Nickel Cadmium Batteries	3	1	2	--

### Section 3: Composition, Information on Ingredients

PRODUCT COMPOSITION	APPRX %	ACGIH TLV	OSHA PEL	NIOSH REL	CAS NO.	EINECS/ELINCS	DANGER SYMBOL	RISK PHRASE	DSL CANADA
Nickel hydroxide (Ni(OH) <sub>2</sub> )	7-13	0.1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup> (as Ni)	0.015 mg/m <sup>3</sup> *	12054-48-7	235-008-5	T	49, 61, 20/22, 38, 42/43, 48/23, 68, 50/53	Y
Nickel	20-36	0.2 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	0.015 mg/m <sup>3</sup> *	7440-02-0	231-111-4	T	R40, 43,,48/23, 52/53, S2, 36/37/39, 45, 61	Y
Cadmium Hydroxide	6-15	-----	-----	-----	21041-95-2	244-168-5	-----	-----	NDSL
Cadmium	6-15	0.01 mg/m <sup>3</sup> 0.002 Respirable	0.005 mg/m <sup>3</sup> (as Cd)	CA*	7440-43-9	231-152-8	T+, N	R45, 26, 48/23/25, 62, 63, 68	Y
Cobalt Hydroxide	0.5-2	0.02 mg/m <sup>3</sup> (as Co)	0.10 mg/m <sup>3</sup> (as Co)	0.05 mg/m <sup>3</sup> (as Co)	21041-93-0	244-166-4	-----	-----	Y
Cobalt	0.5-2	-----	-----	-----	7440-48-4	231-158-0	Xn	R42/43, 53	Y
Potassium hydroxide (KOH)	1-4	2 mg/m <sup>3</sup> (C) STEL	-----	2 mg/m <sup>3</sup> (C)	1310-58-3	215-181-3	C C ≥ 5%	22, 35	Y
Lithium hydroxide (LiOH)	<1	-----	-----	-----	1310-66-2	-----	-----	-----	Y



Trade Secret (TS) Some items on this SDS may be designated as trade secrets. Bonafide requests for disclosure of trade secret information to medical personnel must be made in accordance with the provisions contained in 29 CFR 1910.1200 I 1-13. The full text for all R-Phrases is shown in Section 16.

\*NIOSH recommends that cadmium and nickel be treated as occupational carcinogens.

## Section 4: First Aid Measures

INHALATION:	Remove to fresh air. If not breathing, provide CPR (cardio pulmonary resuscitation). Get immediate medical attention.
SKIN CONTACT:	Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing.
EYE CONTACT:	Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
INGESTION:	If swallowed do not induce vomiting, give large quantities of water to drink. Never give anything to an unconscious person. Get immediate medical attention.

## Section 5: Fire-fighting Measures

FLASH POINT:	Not applicable
FLAMMABLE LIMITS IN AIR (% by vol):	Not applicable
EXTINGUISHING MEDIA:	Under normal conditions the battery cells are nonflammable. At elevated temperatures in a fire situation the cells may emit cadmium fumes and electrolyte. Use extinguishing media for the surrounding fire or CO2, Dry Chemical, or Foam Water Spray.
SPECIAL FIREFIGHTING PROCEDURES:	Fire fighting Equipment; Use self contained breathing apparatus and protective clothing to prevent contact with electrolyte solution. The electrolyte solution is corrosive to all human tissue.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Material does not burn. Use extinguishing agent suitable for the type of surrounding fire.

## Section 6: Accidental Release Measures

### ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Should a battery assembly be dropped, causing the lid to open and spilling battery cells, or a package of individual battery cells ruptures, spilling battery cells, wear gloves and other PPE as appropriate to prevent contact with the electrolyte. Reference Section 8 Exposure Controls/Personal Protection for proper protective equipment.

Warn other workers of spill and contain spill.  
If electrolyte has been spilled use an absorbent like vermiculite to clean up and place in drums for later disposal.  
Flush the spill area with copious amounts of water.  
Place material into a chemical waste container.  
Prevent spills or contaminated rinse water from entering sewers or watercourses.

Disposal method: If the cells are damaged as a result of the spill, they should be repackaged in a 55-gallon drum with a liner and shipped to a fully permitted RCRA TSDRF for recycling. Disposal should be made in accordance with federal, state and local regulations as stated in Section 13.

## Section 7: Handling and Storage

### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

- Stored in the original factory packaging at room temperature in a cool, dry place until ready for use.
- During the charging process of the battery assembly or individual battery cell, it should be done in a well-ventilated area.
- Use only with adequate ventilation.
- Do not inhale vapors.
- Wear proper protective equipment when handling this material.
- Avoid contact with skin, eyes, or clothing.
- Wash hands and face after handling this material.



Care should be taken during the handling and charging of individual battery cells to prevent dropping of tools or other metallic objects on top of the cell that could short the battery cell terminals, causing the release of high energy or heat, and electrolyte. Should a battery assembly be dropped and the lid comes open, spilling the battery cells, or a package of individual battery cells ruptures and spills the battery cells, they may be picked up and repackaged without the use of any special personal protective equipment.

**SPECIFIC USES:**

This product's intended use: Battery

**Section 8: Exposure Controls/Personal Protection**

Charge battery assemblies and individual battery cells in a well ventilated area. Handling of shorted battery cells should only be done while using the PPE designated below. A shorted battery cell could vent releasing electrolyte in a mist or spray. Flammable hydrogen gas may be released during venting.

- VENTILATION: Always provide good general, mechanical room ventilation where this chemical/material is used.
- SPECIAL VENTILATION CONTROLS: Use this material inside totally enclosed equipment, or use it with local exhaust ventilation at points where vapors can be released into the workspace air.
- RESPIRATORY PROTECTION: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or the European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
- PROTECTIVE GLOVES: Wear chemical impervious gloves at all times while working with this product. Recommended glove types include: Laminate Film, Nitrile, or Tri-polymer. Check with your company's glove supplier to ensure chemical resistance.
- EYE PROTECTION: Safety Glasses, Chemical goggles, face shield
- PROTECTIVE CLOTHING: Wear suitable protective clothing to prevent skin contact.
- OTHER EQUIPMENT: Make safety shower, eyewash stations, and hand washing equipment available in the work area.
- WORK/HYGIENE PRACTICES: Avoid breathing vapor. Avoid contact with eyes. Wash hands and face after handling.

**Section 9: Physical and Chemical Properties**

Applicable to electrolyte within the cells

- APPEARANCE - COLOR: White to light gray viscous liquid
- PHYSICAL STATE: Liquid
- ODOR: Odorless

**PRODUCT CRITERIA**

PH	Not Applicable for product
FLASH POINT:	Not Applicable for product
FLAMMABILITY (Solid, gas)	Not Applicable for product
EXPLOSIVE PROPERTIES	Not Applicable for product
OXIDIZING PROPERTIES	Not Applicable for product
SPECIFIC GRAVITY (@25 °C):	1.46 (electrolyte with 45% KOH)
EVAPORATION RATE:	< 1 (Butyl Acetate = 1) (45% KOH)
% VOLATILE by VOLUME	Not Applicable for product
PARTITION COEFFICIENT n-Octanol/Water	Not Applicable for product
BOILING POINT:	2415 °F (electrolyte)
MELTING POINT:	Not Applicable for product
VAPOR PRESSURE	1317 °F : 1 mmHg (electrolyte with 45% KOH)
VAPOR DENSITY (AIR = 1)	Not Applicable for product
SOLUBILITY IN WATER:	100% (electrolyte)
WATER SOLUBILITY IN THE SOLVENT	Not Applicable for product
FREEZING POINT:	Not Applicable for product
VISCOSITY	Not Applicable for product



## Section 10: Stability and Reactivity

STABILITY:	Under normal conditions the Battery is stable.
CONDITIONS TO AVOID:	When shorted the cell will vent releasing cadmium fumes, electrolyte and hydrogen gas.
INCOMPATIBILITY (MATERIALS TO AVOID):	Acids
HAZARDOUS DECOMPOSITION PRODUCTS:	When heated to high temperatures, such as in a fire situation, the cell may emit electrolyte, cadmium fumes, water vapor, plastic vapor, and hydrogen gas or combustion products.
HAZARDOUS POLYMERIZATION:	Will not occur

## Section 11: Toxicological Information

**There is no toxicological information available for the product mixture.**

GHS Required Criteria	Toxicity Criteria	Toxicity Information	Comments	Chemical Constituent
Acute Toxicity	LD50 (Oral/Rat):	1515 mg/kg		Nickel Hydroxide
	LC50 (Inhalation/Rat):	1200 mg/m3/4H		Nickel Hydroxide
	LD50 (Dermal/Rat):	>2 mg/kg		Nickel Hydroxide
	LD50 (Oral/Rat):	2330 mg/kg		Cadmium
	LD50 (Oral/Mouse):	890 mg/kg		Cadmium
	LC50 (Inhalation/Rat):	50 ppm 4 hours		Cadmium
	LD50 (Oral/Rat):	6171 mg/kg		Cobalt
	LD50 (Oral/Rat):	273 mg/kg		KOH
	LC50 (Inhalation/Rat):	960 mg/m3/4 hours		LiOH
	LD50 (Oral/Rat):	210 mg/kg		LiOH
Skin Corrosion/Irritation	Skin Rabbit	Draize 50 mg/24 hours	Severe	KOH
	Skin Human	Draize 50 mg/24 hours	Severe	KOH
Serious Eye Damage / Eye Irritation	Eye Rabbit	1 mg/24 hour	Moderate	KOH
		May cause allergic respiratory reaction		Cobalt
Germ Cell Mutagenicity		No information is available.		
Carcinogenicity		Known to be Human carcinogen (listed as Nickel compounds)	NTP	Nickel Hydroxide
		Known to be Human Carcinogen	NTP	Cadmium
		Group 1 carcinogen	IARC	Nickel Hydroxide
		Group 1 carcinogen	IARC	Cadmium
		Group 2 carcinogen	IARC	Cobalt
		A3-Animal Carcinogen	ACGIH	Cobalt
		Not listed	OSHA	
Reproductive Toxicity		No information is available.		
STOST -- Single Exposure		No information is available.		
STOST -- Repeated Exposure		No information is available.		
Aspiration Hazard		No information is available.		

STOST = Specific Target Organ Systemic Toxicity

### OTHER INFORMATION:

Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.

## Section 12: Ecological Information

		Chemical
BIODEGRADATION:	No information is available.	
BIOACCUMULATION:	No information is available.	
ECO TOXICITY:	Very toxic to aquatic life.	Cadmium



	May cause long lasting harmful effects to aquatic life.	Cobalt
MOBILITY:	No information is available.	

Note: Not all of the ingredients have been tested for Ecotoxicity.

### Section 13: Disposal Considerations

**WASTE DISPOSAL:**

Follow the waste disposal requirements of your country, state, or local authorities.

All nickel-cadmium battery cells should be prevented from entering a landfill facility. Nickel-Cadmium storage batteries are universal waste under RCRA Regulations. They should be recycled and may be returned to MarathonNorco Aerospace, Inc. for recycling or batteries should be shipped to a RCRA permitted TSDRF for recycling of the metals content.

**CONTAMINATED PACKAGING:**

Contaminated packaging material should be disposed of as stated above.

**RINSATE:** Do not dispose of rinse water containing product in a sanitary sewer system or storm water drainage system.

### Section 14: Transport Information



**Battery, Dry**

Sealed Nickel Cadmium batteries are considered to be “dry cell” batteries and are unregulated for purposes of transportation by the U.S. Department of Transportation (DOT), International Aviation Administration (ICAO), International Air Transport Association (IATA) and the International Maritime Organization (IMO). The only requirements for shipping these batteries by DOT 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). The only requirements for shipping these batteries by ICAO and IATA is Special Provision A123, which states: “An electrical battery or 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.”

All Nickel Cadmium batteries are classified as a D006 hazardous waste because of the presence of cadmium. This waste code is assigned because of toxicity, not corrosiveness. These batteries do not meet the definition of a corrosive waste.



**Battery, Wet** Filled with alkali UN2795

### Section 15: Regulatory Information

Directive 1999/45/EC	Not applicable
LABEL FOR SUPPLY:	None
RISK PHRASES:	None

**TOXIC SUBSTANCES CONTROL ACT (TSCA) STATUS:**

This product is in compliance with rules, regulations, and orders of TSCA. All components are listed on the TSCA Inventory.

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTION 313 SUPPLIER NOTIFICATION:**

This regulation requires submission of annual reports of toxic chemical(s) that appear in section 313 of the Emergency Planning and Community Right To Know Act of 1986 and 40 CFR 372. This information must be included in all MSDS’s that are copied and distributed for the material.

The Section 313 toxic chemicals contained in this product are: Cadmium, Potassium Hydroxide, and Lithium Hydroxide.

**CALIFORNIA PROPOSITION 65:**



This regulation requires a warning for California Proposition 65 chemical(s) under the statute. The California proposition 65 chemical(s) contained in this product are: Nickel Hydroxide, Cobalt metal powder, Cadmium

STATE RIGHT-TO-KNOW TOXIC SUBSTANCE OR HAZARDOUS SUBSTANCE LIST:

Florida Toxic Substance(s):	Cobalt
Massachusetts's hazardous substance(s):	Nickel soluble compound; Cobalt
Pennsylvania hazardous substance code(s):	Nickel soluble compound; Cobalt
New Jersey	Nickel soluble compound; Cobalt
Illinois	Cobalt
Michigan	Cobalt
Minnesota	Nickel insoluble compounds; Cobalt

CANADA:

This MSDS/SDS will be non-compliant 3 years after the issue date.

WHMIS-INFORMATION:

KOH: D1B - Poisonous and infectious material - Immediate and serious effects - Toxic  
E - Corrosive material

The chemical components of this product are in compliance with the WHMIS regulations. This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

EUROPEAN UNION:

This product has been reviewed for compliance with the following European Community Directives: REACH 1907/2006; Directive 67/548/EEC, Directive 2001/59/EC, Directive 91/155/EC, and Directive 2001/58/EC.

### Section 16: Other Information

European Community Hazards Identification:

- R38: Irritating to skin
- R61: May cause harm to the unborn child
- R49: May cause cancer by inhalation
- R68: Possible risk of irreversible effects
- R20/22: Harmful by inhalation and if swallowed
- R42/43: May cause sensitization by inhalation and skin contact
- R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation
- R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
- R45: May cause cancer
- R26: Very toxic by inhalation
- R48/23/25: Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed
- R62: Possible risk of impaired fertility
- R63: Possible risk of harm to the unborn child
- R53: May cause long-term adverse effects in the aquatic environment
- R22: Harmful if swallowed
- R35: Causes severe burns
- S2: Keep out of the reach of children
- S22: Do not breathe dust
- S24: Avoid contact with skin
- S37: Wear suitable gloves
- S61: Avoid release to the environment. Refer to special instructions/safety data sheet
- S53: Avoid exposure - obtain special instructions before use
- S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
- S60: This material and its container must be disposed of as hazardous waste
- S61: Avoid release to the environment. Refer to special instructions/safety data sheet
- S1: Keep locked up
- S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
- S36/37/39: Wear suitable protective clothing, gloves and eye/face protection
- S45: In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)

Danger Symbol(s):	T+	Very Toxic
	T	Toxic
	N	Dangerous to the Environment
	Xn	Harmful
	C	Corrosive





Revision Comments: Initial version February 20, 2014  
Revision Number: AB DCR 59619  
Revision Number: AC DCR 59846

Information Sources: RTECS, REACH, OSHA 29CFR 1910.1200

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