

## MATERIAL SAFETY DATA SHEET



8301 Imperial Drive  
P.O. Box 8233  
Waco, Texas 76714-8233  
254-776-0650

Type of Data Sheet:  New  Revised

Date Prepared: March 7, 2008

**This MSDS may be used to comply with the American National Standard Institute (ANSI) 16-paragraph format for MSDS**

**SECTION 1 – PRODUCT AND COMPANY DESCRIPTION**

MarathonNorco Aerospace, Inc.  
8301 Imperial Drive  
Waco, Texas 76712-6588

**For Product Information:**  
254-776-0650

**Product Name:**  
Battery, Storage

**Emergency Phone Number:**  
USA: 800-424-9300  
International: 11-1-703-527-3887

**Trade Name:**  
Nickel Cadmium Battery

**National Stock Class:**  
6140

**SECTION 2 – CHEMICAL COMPOSITION**

HAZARDOUS COMPONENT [SPECIFIC CHEMICAL IDENTIFICATION COMMON NAME(S)]	CAS NUMBER	% WEIGHT
Cadmium: as Cadmium	7440-43-9	6 - 15
and Cadmium Hydroxide	21041-95-2	6 - 15
Nickel: as Nickel	7440-02-0	20 - 36
and Nickel Hydroxide	12054-48-7	7 - 13
Cobalt : as Cobalt metal	7440-48-4	0.5 - 2
and Cobalt Hydroxide	21041-93-0	0.5 - 2
Potassium Hydroxide	1310-58-3	1 - 4
Lithium Hydroxide	1310-65-2	< 1

**SECTION 3 – HAZARDS IDENTIFICATION**

ROUTE OF ENTRY:	INHALATION	ABSORPTION	INGESTION
	Unlikely	Unlikely	No
<b>HEALTH HAZARDS (ACUTE and CHRONIC):</b>			
Under normal conditions of use, no exposure to hazardous components exists. If incinerated, inhalation of fumes may cause respiratory systems irritation, fumes will also irritate eye tissues (acute); chronic exposure may cause kidney dysfunction and lung injury.			
<b>CARCINOGENICITY:</b>	<b>NTP</b>	<b>IARC MONOGRAPHS</b>	<b>OSHA REGULATED</b>
	Not established for batteries	Not established for batteries	Not established for batteries
<b>(NICKEL AND CADMIUM ARE LISTED AS POTENTIAL CARCINOGENS BY NTP, IARC, AND OSHA)</b>			
<b>SIGNS and SYMPTOMS of EXPOSURE:</b>			
If incinerated, chest pain, coughing, sweating, chills, shortness of breath and weakness along with possible eye irritation.			
<b>MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:</b>			
If incinerated, respiratory systems disorders, prostate disorders, liver and kidney disorders, vision problems.			

**SECTION 4 – FIRST AID MEASURES**
**EMERGENCY FIRST AID PROCEDURES:**

If contact with potassium hydroxide electrolyte, flush with water for 15 minutes and contact physician; if inhaled, remove from exposure and contact physician.

SECTION 5 – FIRE FIGHTING MEASURES			
<b>FLASH POINT (METHOD USED)</b>	<b>FLAMMABLE LIMITS</b>	<b>LEL</b>	<b>UEL</b>
None	Non-Flammable	N/A	N/A
<b>EXTINGUISHING MEDIA</b>			
Use extinguishing media appropriate for surrounding fire.			
<b>SPECIAL FIRE FIGHTING PROCEDURES</b>			
Fire fighters should wear proper protective equipment and self-contained breathing apparatus with full face-piece operated in positive pressure mode.			
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS</b>			
Contact with strong oxidizers may cause fire or explosion. Cadmium and Nickel fumes are toxic and can cause death.			

SECTION 6 – ACCIDENTAL RELEASE
<b>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</b>
Battery and cell cases will normally contain materials of concern. Use industrial absorbent to collect liquid potassium hydroxide.

SECTION 7 – HANDLING AND STORAGE
<b>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING</b>
Do not invert. Avoid breaking crushing or otherwise destroying the physical integrity of the cell or battery. Store in cool, dry place.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION
Under normal conditions of use, no special personal protection is required. Use adequate local exhaust ventilation when handling the liquid in the battery, i.e., potassium hydroxide solution. Wear a dust or mist mask, eye goggles and face shield, rubber gloves and protective clothing to minimize skin contact.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES									
Chemical	Boiling Point (°C)	Specific Gravity	Vapor Pressure	Melting Point (°C)	Vapor Density	Evaporation Rate	Solubility in Water	Odor	Appearance
Cadmium	407	8.642	N/A	160.5	N/A	N/A	Insoluble	None	Silver Color Metal
Cadmium Hydroxide	N/A	4.79	N/A	Decomp. 300	N/A	N/A	Insoluble	None	White Salt
Nickel	1449	8.90	N/A	790.5	N/A	N/A	Insoluble	None	Silver Color Metal
Nickel Hydroxide	N/A	4.15	N/A	Decomp. 230	N/A	N/A	Insoluble	None	Green Black Salt
Cobalt	3100	8.9	N/A	1493	N/A	N/A	Insoluble	None	Steel Gray Metal
Cobalt Hydroxide	N/A	3.597	N/A	Decomp 250	N/A	N/A	Insoluble	None	Rose-Red Powder
Potassium Hydroxide	716.6	2.044	N/A	182.2	N/A	N/A	52% W/W	None	White Salt
Lithium Hydroxide	Decomp. 924	2.54	N/A	470	N/A	N/A		None	White Salt

SECTION 10 – STABILITY AND REACTIVITY			
<b>STABILITY</b>	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	N/A
<b>INCOMPATIBILITY (MATERIALS TO AVOID)</b>			
Strong oxidizing agents, nitrates, nitric acid.			
<b>HAZARDOUS DECOMPOSITION OR BY-PRODUCTS</b>			
Nickel Compounds, Cadmium Compounds, Caustic Liquid			
<b>HAZARDOUS POLYMERIZATION</b>	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	N/A

<b>SECTION 11 – TOXICOLOGICAL INFORMATION</b>			
<b>HAZARDOUS COMPONENT [SPECIFIC CHEMICAL IDENTIFICATION COMMON NAME(S)]</b>	<b>OSHA PEL</b>	<b>ACGIH TLV</b>	<b>CAS NUMBER</b>
Cadmium: as Cadmium	5 µg/m <sup>3</sup> (Dust)	0.01 mg/m <sup>3</sup>	7440-43-9
and Cadmium Hydroxide	5 µg/m <sup>3</sup> (as Cd)	0.05 mg/m <sup>3</sup>	21041-95-2
Nickel: as Nickel	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	7440-02-0
and Nickel Hydroxide	1 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	12054-48-7
Cobalt : as Cobalt metal	0.1 mg/m <sup>3</sup>	0.02 mg/m <sup>3</sup> TWA	7440-48-4
and Cobalt Hydroxide	0.1 mg/m <sup>3</sup>	0.02 mg/m <sup>3</sup> TWA	21041-93-0
Potassium Hydroxide	2 mg/m <sup>3</sup> (Ceiling)	2 mg/m <sup>3</sup> (Ceiling)	1310-58-3
Lithium Hydroxide	Not Established	Not Established	1310-65-2

<b>SECTION 12 – ECOLOGICAL INFORMATION</b>
Cadmium and Cadmium Compounds are very toxic to aquatic organisms, may cause long-term adverse effects in aquatic environment. Avoid release to the environment.

<b>SECTION 13 – DISPOSAL INFORMATION</b>
<b>WASTE DISPOSAL METHOD</b>
Cells and batteries may be returned at senders expense to a Permitted Treatment, Storage, and Disposal Facility (TSDF). Disposal shall be by approved methods.

<b>SECTION 14 – TRANSPORT INFORMATION</b>
<b>SHIPPING NAME</b>
<input type="checkbox"/> Battery, Dry For transportation purposes these sealed nickel-cadmium batteries are non-hazardous and not subject to any of the provisions of Title 49 Code of Federal Regulations, Parts 170-189
<input type="checkbox"/> Battery, Wet Filled with alkali UN2795

<b>SECTION 15 – REGULATORY INFORMATION</b>																		
<b>FEDERAL REGULATIONS</b>																		
TSCA Status: The intentional ingredients of this product are listed																		
<table border="1"> <thead> <tr> <th>CERCLA RQ – 40 CFR 302.4(a)</th> <th>Component</th> <th>RQ (lbs)</th> </tr> </thead> <tbody> <tr> <td></td> <td>Cadmium</td> <td>1</td> </tr> <tr> <td></td> <td>Cadmium Hydroxide</td> <td>1</td> </tr> <tr> <td></td> <td>Nickel</td> <td>1</td> </tr> <tr> <td></td> <td>Nickel Hydroxide</td> <td>1</td> </tr> <tr> <td></td> <td>Potassium Hydroxide</td> <td>1000</td> </tr> </tbody> </table>	CERCLA RQ – 40 CFR 302.4(a)	Component	RQ (lbs)		Cadmium	1		Cadmium Hydroxide	1		Nickel	1		Nickel Hydroxide	1		Potassium Hydroxide	1000
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	Cadmium	1																
	Cadmium Hydroxide	1																
	Nickel	1																
	Nickel Hydroxide	1																
	Potassium Hydroxide	1000																
SARA 302 Components – 40 CFR 355 Appendix A : None																		
Section 311/312 Hazard Class – 40 CFR 370.2																		
Immediate ( ) Delayed ( X ) Fire ( ) Reactive ( X ) Sudden Release of Pressure ( )																		
SARA 313 Components – 40 CFR 372.65																		
Cadmium – CAS : 7440-43-9 Nickel – CAS : 7440-02-0																		
OSHA Process Safety Management - 29 CFR 1910 None Listed																		
EPA Accidental Release Prevention - 40 CFR 68 None Listed																		

<b>SECTION 16 – OTHER INFORMATION</b>
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**Key Legend Information:**

ACGIH – American Conference of Governmental Industrial Hygiene  
CAS – Chemical Abstract Service  
CERCLA – Comprehensive Environmental Response Compensation and Liability Act  
CFR – Code of Federal Register  
EPA – Environmental Protection Agency  
IARC – International Agency on Research of Cancer  
LEP – Lower Explosion Limit  
NTP – National Toxicology Program  
N/A – Not Applicable  
OSHA – Occupational Safety and Health Administration

PEL – Permissible Exposure Limit  
UEL – Upper Explosion Limit  
TLV – Threshold Limit Value  
TWA – Time Weighted Average