



HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET

1. IDENTIFICATION

1.1 Product	
Product Name Nickel-Cadmium Aircraft Cells/Batteries	
Trade Name Sintered plate nickel cadmium cells/batteries, (Standard, Low maintenance & Reduced maintenance)	
Electrochemical System: Nickel-Cadmium, alkaline electrolyte	
1.2 Supplier	
NAME:	HBL Power Systems Limited,
Address:	8-2-601, Road No10, Banjara Hills, Hyderabad-500 034, Telangana, India.
Phone:	+91 (0) 40 23355575
Fax:	+91 (0) 40 23355048
Factory Address:	HBL Power Systems Limited, Lalgadi Malakpet, Shameerpet Mandal, Hyderabad-500 078, Telangana, India
Phone:	+91 (0) 8418 301640
Fax:	+91 (0) 8418 301652, +91 (0) 8418 301657
1.3 Emergency Contact: www.hbl.in look for <<contact us>>	

2. HAZARD IDENTIFICATION

2.1 Ingredients

Ingredients			Classification as per Annex-I of Directive 67/548/EEC		
Chemical Name	Formula	CAS No	Symbol	Risk phrase	Safety phrase
Cadmium hydroxide	Cd(OH) ₂	21041-95-2	Xn N	R20/21/22 R50/53	S2, S60, S61
Nickel hydroxide	Ni(OH) ₂	12054-48-7	Carc. Cat3 Xn N	R40 R20/22 R43 R50/53	S2, S22, S36 S60, S61
Potassium Hydroxide	KOH	1310-58-3	Xn C	R22 R35	S ^{1/2} , S26, S36/37/39, S45
Cobalt Hydroxide	Co(OH) ₂	21041-93-0	Xn Xi	R20/21/22 R36/R37/R38 R43	S24, S26 S36/37; S39
Lithium Hydroxide	Li (OH) ₂	1310-65-2	Not Classified	Not Classified	Not Classified



HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET

2.2 Effects of Overexposure

Eye Effects	Contact with electrolyte solution inside battery causes very rapid, severe damage. Extremely corrosive to eye tissues. May result in permanent blindness
Skin Effects	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
Ingestion	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
Inhalation	Mists generated during activation procedures may cause varying degrees of irritation to the nasal mucous membranes and respiratory tract tissues varying from mild irritation of nasal mucous membranes to damage of lung tissues proper. Inhalation of cadmium compounds may cause dry throat, cough, headache, vomiting, chest pain and/or chills. Excessive overexposure may result in pulmonary edema, breathing difficulty, and prostration
Carcinogenicity	NIOSH recommends that nickel and cadmium be treated as occupational carcinogens.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS No	Quantity
Cadmium (as Cadmium and Cadmium Hydroxide)	7440-43-9 21041-95-2	8%-15%
Cobalt (as Cobalt Hydroxide)	21041-93-0	≈ 1%
Copper	7440-50-8	9%-11%
Electrolyte Solution (20-30% Potassium Hydroxide)	1310-58-3	12-19%
Nickel (as Nickel and Nickel Hydroxide)	7440-02-0 12054-48-7	20-36%
Lithium Hydroxide	1310-65-2	<1
Polyamide 11	-	11%-15%
Steel (Fe)	-	20%

4. FIRST AID MEASURES

4.1 Battery Electrolyte

Eye Contact	Flush with plenty of water for at least 20 minutes. Get immediate medical attention.
Skin Contact	Remove contaminated clothing and flush affected areas with plenty of water for at least 30 minutes
Ingestion	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.
Inhalation	Remove to fresh air. Give oxygen or artificial respiration if needed. Get immediate medical attention.



**HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET**

4.2 Nickel and Cadmium Compounds

Skin contact	Wash with cold water and soap for 15 minutes
---------------------	--

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Carbon dioxide (CO₂) and Sand

5.2 Melting and Boiling Point

Element/Compound	Melting Point	Boiling Point
Cadmium	608°F/320°C	1410°F/766°C
Cadmium hydroxide	N/A	2838°F/1559°C (sublimes)
Copper	1989°F/1083°C	4653°F/2567°C
Nickel	2645°F/1452°C	4950°F/2732°C
Nickel Hydroxide	N/A	445°F/229°C (Decomposes to NiO)
Cell case material: Polyamide 11	370-374°F/188-190°C	N/A

5.3 Special Fire Fighting Procedures

Use self-contained breathing apparatus to avoid breathing toxic fumes. Wear protective clothing and equipment to prevent potential body contact with electrolyte solution or mixture of water and electrolyte solution. Disconnect or cut all cables to and from battery-especially ground connection.

Unusual Fire and Explosion Hazards

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

6. ACCIDENTAL RELEASE MEASURES

6.1 Electrolyte Solution Spills

Small (up to 20 liters)	Flush with water and neutralize with dilute citric acid.
Large	Contain material in suitable containers or holding area. DO NOT allow material to enter sewers, streams, or storm conduits. Recover material with vacuum truck and dispose of properly. Reportable Quantity: 450 Kgs. 40 CFR-117.13

**HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET**

7. HANDLING AND STORAGE

These cells and the batteries constructed from them may be highly charged and are capable of high-energy discharge. Care should be taken to handle cells properly to avoid shorting or misuse that will result in a rapid, uncontrolled electrical, chemical, or heat energy release.

Do not transport activated batteries without vent caps in place.

When removing battery from service, visually inspect for leakage prior to handling. If leakage has occurred follow spill management procedures.

Store in sealed packaging and in normal vertical position at temperature +20°C ± 15°C and humidity inferior at 70%

Keep away from exposed flames, sparks, and other ignition sources.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Control		
Ingredients	CAS No	Exposure Limits
Cadmium (as Cadmium and Cadmium Hydroxide)	7440-43-9 21041-95-2	5.0 mcg/m ³ dust-OSHA 0.05 mg/m ³ ACGIH CEILING-Fume
Cobalt (as Cobalt Hydroxide)	21041-93-0	0.1 mg/ m ³ OSHA
Copper	7440-50-8	1 mg/ m ³ dust- OSHA
Electrolyte Solution (20-30% Potassium Hydroxide)	1310-58-3	2mg/ m ³ ACGIH CEILING-Air
Nickel (as Nickel and Nickel Hydroxide)	7440-02-0 12054-48-7	1 mg/ m ³ - OSHA
Personal Protection		
Perform activation procedures in a well-ventilated area. Battery operating areas must be well ventilated for removal of potentially dangerous and harmful gases generated. Normal reactions inside the battery liberate explosive and flammable hydrogen gas.		
	Respiratory Protection	Use NIOSH approved mist respirator during activation and actual usage to maintain exposure levels below TWA.
	Eye Protection	Use splash goggles or face shield whenever handling a battery
	Hand Protection	If exposure to electrolyte solution or dried salts is likely, use any water insoluble, non-permeable glove, i.e., synthetic rubber. DO NOT use leather or fabric gloves.
	Other Protective Equipment	Rubber apron or rainwear, or equivalent if exposure to electrolyte solution is likely.



HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not Applicable	Melting Point: Not Applicable
Vapor pressure: 2mm Hg at 20°C	Vapor density: Not Applicable
Specific Gravity: 1.17-1.30 (electrolyte)	Evaporation Rate: Not Determined
Solubility in water: Electrolyte solution is completely soluble	Remainder: is insoluble

10. STABILITY AND REACTIVITY

CAUTION: NEVER ACTIVATE OR TOP UP WITH ACID

Incompatibilities	Aluminium, 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
Hazardous Decomposition	Nickel compounds, cadmium compounds, and potassium hydroxide
	Note that normal reactions inside battery liberate explosive and flammable hydrogen gas. Do not seal battery from atmosphere. Hazardous Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Ingredients	CAS No	LD ₅₀ (Oral, Rat)
Cadmium Hydroxide	21041-95-2	Not Available
Nickel Hydroxide	12054-48-7	1600 mg/Kg
Potassium Hydroxide	1310-58-3	365 mg/Kg
Cobalt hydroxide	21041-93-0	Not Available

12. ECOLOGICAL INFORMATION

The electrolyte solution (20-30% Potassium Hydroxide) is very toxic to aquatic organisms. It may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Nickel Cadmium aircraft batteries are universal wastes under RCRA. They may be returned to HBL Power Systems, Hyderabad or routed to the distributor/seller for recycling.

These batteries are TCLP Toxic. These batteries and the electrolyte solution they contain are considered to be corrosives. If not recycled, they must be disposed of in accordance with state and local hazardous waste regulations.

**HBL POWER SYSTEMS LIMITED
NICKEL CADMIUM AIRCRAFT BATTERY
SAFETY DATA SHEET**

14. TRANSPORT INFORMATION

14.1 United Nations

UN No.: 2795

14.2 International Conventions

Air : IATA
Sea : IMDG
Land : ADR (road) or RID (rail) Batteries exempt according to special Paragraph No. 598.

UN No.	Proper shipping name	RAIL & ROAD (ADR)				SEA (IMDG)					AIR (IATA)			
		CL	Code	Packing group	Labeling	CL	Risk	EmS	Packing group	Labeling	CL	Risk	Packing group	Labeling
2795	Batteries, Wet, Filled with Alkali	8	C 11	***	None	8	***	F-A, S-B	II	8	8	***	II	8

15. REGULATORY INFORMATION

15.1 Product Marking



15.2 EPCRA Reporting Requirements

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)

CAS No	Chemical Name	Percent by weight
7440-43-9	Cadmium	8%-16%
7440-48-4	Cobalt	1%
7440-50-8	Copper	9%-11%
7440-02-0	Nickel	19-36%

15.3 EC Classification**15.3.1 Symbols**

C	Corrosive
N	Dangerous for the environment
X _n	Harmful
X _i	Irritant

15.3.2 Risk Phrases

R20	Harmful by inhalation
R21	Harmful in contact with skin
R22	Harmful if swallowed
R36	Irritating to eyes
R37	Irritating to respiratory system
R38	Irritating to skin
R40	Limited evidence of a carcinogenic effect
R41	Risk of serious damage to the eyes
R43	May cause sensitization by skin contact
R50/53	Very Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

15.3.3 Safety Phrases

S ^{1/2}	Keep locked up and out of the reach of children
S2	Keep out of the reach of children
S20	When, using, do not eat or drink
S22	Do not breath dust
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36	Wear suitable protective clothing
S37	Wear suitable gloves
S39	Wear eyes/face protection
S45	In case of accident or if you feel unwell, seek medical advice
S60	Must be disposed of as hazardous waste
S61	Avoid release to environment

16 OTHER INFORMATION

Healthcare Information and Management Systems (HIMS) Society Ratings	
Health	3
Flammability	1
Reactivity	2