



TEIG NICKEL CADMIUM BATTERY

Section 1 - Product and Company Identification
TEIG NICKEL CADMIUM BATTERY

Product Identification: TEIG NICKEL CADMIUM BATTERY

Date of MSDS: 08/10/2002 **Technical Review Date:** 10/08/2013

Trade Name: TEIG

Chemical System: Nickel Cadmium

Nominal Voltage: 1.2V

Designated for Recharge: Y

Company's Information
Company's Name: AMERICAN TOPPOWER

Company's Address: 2033 ROUTE 130 UNIT N, MONMOUTH JUNCTION, NJ 08852

General Information Telephone: 732-821-1000

Emergency Telephone: 732-821-1000

Section 2 - Composition/Information on Ingredients
TEIG NICKEL CADMIUM BATTERY

Name: NICKEL (NICKEL AND NICKEL HYDROXIDE)

CAS: 7440-02-0 **RTECS #:** QR5950000

% low Wt: 23. **Code:** M **% high Wt:** 30. **Code:** M

Environmental Wt: **Other REC Limits:** None Recommended

OSHA PEL: 1 MG/M3 **Code:** T **OSHA STEL:** N/P **Code:**
ACGIH TLV: 1 MG/M3 **Code:** T **ACGIH STEL:** Not Established **Code:** T

EPA Rpt Qty: 100 LBS **DOT Rpt Qty:** 100 LBS

Ozone Depleting Chemical: N

Name: CADMIUM (CADMIUM AND CADMIUM HYDROXIDE)

CAS: 7440-49-3 **RTECS #:** EU9800000

% low Wt: 18. **Code:** M **% high Wt:** 25. **Code:** M

Environmental Wt: **Other REC Limits:** 0.3 MG/M3 Stely

OSHA PEL: SEE 1919.1027 **Code:** T **OSHA STEL:** N/P **Code:**
ACGIH TLV: 0.01 MG/M3 **Code:** T **ACGIH STEL:** N/P **Code:** T

EPA Rpt Qty: 10 LBS **DOT Rpt Qty:** 10 LBS

Ozone Depleting Chemical: N

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

Name: COBALT (COBALT AND COBALT HYDROXIDE)

CAS: 7440-48-4

RTECS #: GF8750000

% low Wt: 1.

Code: M

% high Wt: 2. Code: M

Environmental Wt:**Other REC Limits:** None Recommended

OSHA PEL: 0.1 MG/M3

Code: T

OSHA STEL: N/P

Code:

ACGIH TLV: 0.02 MG/M3

Code: T

ACGIH STEL: Not Established

Code: T

EPA Rpt Qty:

DOT Rpt Qty:

Ozone Depleting Chemical: N

Name: POTASSIUM HYDROXIDE

CAS: 1310-58-3

RTECS #: TT2100000

% Text: 3

Code: M

Environmental Wt:**Other REC Limits:** None Recommended

OSHA PEL: 0.2 MG/M3

Code: F

OSHA STEL: N/P

Code:

ACGIH TLV: Not Established

Code: T

ACGIH STEL: C2 MG/M3

Code: T

EPA Rpt Qty: 1000LBS

DOT Rpt Qty: 1000LBS

Ozone Depleting Chemical: N

Notes:1. Concentrations vary depending on the state of charge or discharge.

2. The battery cell should not be opened or exposed to heat because exposure to the above ingredients contained within could be harmful under some circumstances.

Section 3 - Hazards Identification, Including Emergency Overview
TEIG NICKEL CADMIUM BATTERY

Threshold Limit Values: See Section 9.

Effects of Single (Acute) Overexposure:**Inhalation:**

During normal use inhalation is an unlikely route of exposure due to containment of hazardous materials within the battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach in the battery cell case, cadmium dusts and fumes may be emitted. Inhalation of cadmium dusts or fumes may cause throat dryness, respiratory irritation, headache, nausea, vomiting, chest pain, extreme restlessness and irritability, pneumonitis, and bronchopneumonia. In the case of high concentration exposures (e.g., above 1 to 5 MG/M3 during an eight hour period) death may occur within several days after the exposure.

Ingestion:

If the battery case is broken in the digestive tract, the electrolyte may cause localized burns. Ingestion of cadmium compounds may result in increased salivation, choking, nausea, persistent vomiting, diarrhea, abdominal pain, anemia, tenesmus, and kidney dysfunction.

Skin Absorption:

No evidence of adverse effects from available data.

Skin Contact:

Exposure to the electrolyte contained inside the battery may result in chemical burns.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

Exposure to nickel may cause dermatitis in some sensitive individuals.

Eye Contact:

Exposure to the electrolyte contained inside the battery may result in severe irritation and chemical burns.

Carcinogenicity:

Cadmium and nickel have been identified by the National Toxicology Program (NTP) as reasonably anticipated to be carcinogens. U.S. EPA classified cadmium as a "B1" probable human carcinogen. The International Agency for Research On Cancer (IARC) recommended that cadmium be listed as a "A2" probable human carcinogen, and the American Conference of Government Industrial Hygienists (ACGIH) has proposed listing cadmium as an "A2" carcinogen.

Other Effects of Repeated (Chronic) Exposure:

Repeated overexposures to cadmium may result in lung cancer; lung, kidney, and liver dysfunction; Skeletal disease (e.g. osteoporosis) and reproductive toxicity. Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.

Medical Conditions Aggravated by Exposure:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

Section 4 - First Aid Measures
TEIG NICKEL CADMIUM BATTERY

First Aid:

Swallowing: Do not induce vomiting. Seek medical attention immediately.

Skin: If the internal cell materials of an opened battery cell come into contact with the skin, immediately flush with water.

Inhalation: If potential for exposure to cadmium or nickel fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

Eye: If the contents from an opened battery come into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

Neutralizing Agent: Acetic Acid

Section 5 - Fire Fighting Measures
TEIG NICKEL CADMIUM BATTERY

Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:

Autoignition Temperature Text: N/A

Lower Limit(s): N/A

Upper Limit(s): N/A

Fire Fighting Procedures: If incinerated, wear NIOSH/MSHA approved SCBA and full protective equipment (FP N).

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

Unusual Fire or Explosion Hazard: Exposure to temperature of above 212°F can cause evaporation of the liquid content of the potassium hydroxide electrolyte resulting in the rupture of the cell. Potential for exposure to cadmium fumes during fire.

Extinguishing Media: Any class of extinguishing medium may be used on the batteries or their packing material.

Section 6 - Accidental Release Measures

TEIG NICKEL CADMIUM BATTERY

Spill Release Procedures: Spill and leaks are unlikely because cells are contained in an hermetically-sealed case. If the battery case is breached, don protective clothing that is impervious to caustic materials and absorb or pack spill residues in inert material. Dispose of as a hazardous waste in accordance with applicable state and federal regulations. Resultant spill residues may be characterized as D002 (caustic) and D006 (cadmium) pursuant to the federal Resource Conservation and Recovery Act (RCRA). See Section 5 for response to fires or explosions.

Section 7 - Handling and Storage

TEIG NICKEL CADMIUM BATTERY

Storage: Store in a cool, dry place. But prevent condensation on cell or battery terminals. Elevated temperatures may result in reduced battery life. Optimum storage temperatures are between -31°F and 95°F.

Mechanical Containment: If there are special encapsulations or sealing requirements, consult your TEIG NICKEL CADMIUM BATTERY representative about possible cell hazard precautions or limitations.

Handling: Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture the battery cell case. Batteries packaged in bulk containers should not be shaken. Metal covered tables or belts used for assembly of batteries into devices can be the source of short circuits; apply insulating material to assembly work surface.

Soldering/welding: If soldering or welding to the case of the battery is required, consult your TEIG NICKEL CADMIUM BATTERY representative for proper precautions to prevent seal damage or external short circuit.

Charging: This battery is designed for recharging. A loss of voltage and capacity of batteries due to self-discharge during prolonged storage is unavoidable. Charge battery before use. Observe the specified charge rate since higher rates can cause a rise in internal gas pressure which may result in damaging heat generation or cell rupture and or venting.

Section 8 - Exposure Controls & Personal Protection

TEIG NICKEL CADMIUM BATTERY

Respiratory Protection: Not required under normal use.

Ventilation: Not required under normal use.

Protective Gloves: Not required under normal use.

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

Eye Protection: Not required under normal use.

Section 9 - Physical & Chemical Properties
TEIG NICKEL CADMIUM BATTERY

The battery cell is contained in a hermetically-sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, hazardous materials are fully contained inside the battery cell. However, if exposed to a fire, explosion, extreme abuse, misuse, or improper disposal that results in breaching of the battery cell case, hazardous materials may be released. The following physical data relating to the hazardous materials contained within the battery cell are provided for the user's information.

Cadmium:

Melting point (°F): 610	Boiling point (°F): 1,407
% volatile by volume:	Vapor Pressure(mm Hg):
Evaporate Rate:	Vapor Density (Air=1):
Specific Gravity (H ₂ O): 8.65	
Solubility in Water: Insoluble	
Appearance and Odor: Powder	

Cadmium Hydroxide:

Melting point (°F):	Boiling point (°F):
% volatile by volume:	Vapor Pressure (mm Hg):
Evaporate Rate:	Vapor Density (Air=1):
Specific Gravity (H ₂ O): 4.79	
Solubility in Water: Practically insoluble	
Appearance and Odor: Powder	

Nickel Powder:

Melting point (°F): 2,831	Boiling point (°F): 5,134
% volatile by volume:	Vapor Pressure (mm Hg):
Evaporate Rate:	Vapor Density (Air=1):
Specific Gravity (H ₂ O): 8.90	
Solubility in Water: Insoluble	
Appearance and Odor: Powder	

Nickel Hydroxide:

Melting point (°F): *	Boiling point (°F):
% volatile by volume:	Vapor Pressure (mm Hg):
Evaporate Rate:	Vapor Density (Air=1):
Specific Gravity (H ₂ O):	
Solubility in Water: Insoluble	
Appearance and Odor: Apple green powder	

*Note: decomposes above 392_iF into NiO and H₂O.

Potassium Hydroxide:

Melting point (°F): *	Boiling point (°F):
% volatile by volume:	Vapor Pressure (mm Hg):
Evaporate Rate:	Vapor Density (Air=1):
Specific Gravity (H ₂ O): 8.65	
Solubility in Water: Soluble in 0.9 part water, 0.6 part in boiling water	

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

Appearance and Odor: White or slightly yellow

*Note: Potassium hydroxide is present as a liquid or paste and acts as the electrolyte in the battery cell.

Section 10 - Stability & Reactivity Data
NICKEL CADMIUM BATTERY

Stability Indicator: YES

Materials to Avoid:

NOT APPLICABLE.

Stability Condition to Avoid:

NOT APPLICABLE.

Hazardous Decomposition Products:

TOXIC MATERIALS.

Hazardous Polymerization Indicator: NO

Conditions to Avoid Polymerization:

NOT RELEVANT.

Section 11 - Disposal Considerations
NICKEL CADMIUM BATTERY

Waste Disposal Methods:

SEND TO A CERTIFIED HAZARDOUS WASTE DISPOSAL SITE.

Section 12 – Recycling and Disposal
TEIG NICKEL CADMIUM BATTERY

All TEIG Nickel Cadmium batteries must be recycled or disposed properly.

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F. Such treatment can vaporize the liquid electrolyte causing cell rupture. Incineration may result in cadmium emissions.

Section 13 - Regulatory Information
NICKEL CADMIUM BATTERY

SARA Title III Information:

N/P

Federal Regulatory Information:

N/P

State Regulatory Information:

N/P

Section 14 - Other Information
TEIG NICKEL CADMIUM BATTERY

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. American Toppower makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities reliance on it.

TEIG sealed Nickel Cadmium batteries are considered to be "dry cell" batteries and are not subject to dangerous goods regulation for the purpose of transportation by the U.S. Department of Transportation (DOT), the International Civil Aviation Administration (ICAO), the International Air Transport Association (IATA) or the International Maritime Dangerous Goods regulations (IMDG). The only DOT requirement for shipping Nickel Cadmium batteries 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)." IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

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.
