

Material Safety Data Sheet

Material Name: KAPower® Supercapacitor Module

ID: KBI-131197

Section 1 - Chemical Product and Company Identification

Manufacturer's Part Number's: 571000, 571001, 571004, 571005, 700000, 700001, 700002, 700003, 700010, 700011, 700012, 700014, 800010, 800011, 800012, 800013, 800014, 800015, 800020, 800021, 800022

Chemical Name: Article

Product Use: Electrochemical Capacitor

24-Hour Emergency Telephone: Chemtrec (800) 424-9300 or 1-(703) 527-3887

Manufacturer Information:

KBi/Kold-Ban International, Ltd.

8390 Pingree Road

Lake in the Hills, IL 60156

Phone: (847) 658-8561

Fax: (847) 658-9280

Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent (weight)
7440-02-0	Nickel (as metal and compounds)	15-40
7439-89-6	Steel	10-30
7732-18-5	Water	7-13
Not Available	Glass Nylon Composite (case)	5-10
7440-44-0	Carbon	5-10
Not Available	Propylene copolymer	5-10
7440-50-8	Copper	1-5
1310-58-3	Potassium hydroxide	1-5
Not Available	Polyvinyl chloride	1-5
Not Available	Perchlorovinyl chloride	1-5

Component Information/Information on Non-Hazardous Components: This product is considered to be an article according to 29 CFR 1910.1200 (OSHA Hazard Communication Standard). While no specific safety information is required for articles, this Material Safety Data Sheet is provided for informational purposes.

Section 3 - Hazards Identification

Emergency Overview: As manufactured and supplied, the KAPower® module is not hazardous under normal conditions of use. However, corrosive alkaline electrolyte may leak from damaged modules and cause eye, skin, respiratory and digestive tract burns. If improperly charged, module may vent flammable hydrogen gas. Use methods suitable to fight surrounding fire. Firefighters should wear full protective clothing and self contained breathing apparatus.

Potential Health Effects:

Eyes: Electrolyte solution is corrosive to the eyes, with possible corneal damage and permanent vision impairment.

Skin: Depending on duration and quantity of exposure, electrolyte solution will cause irritation to chemical burns.

Ingestion: Electrolyte solution will cause burns to mouth and throat. Ingestion of large quantities can cause tissue ulceration of the gastrointestinal tract.

Inhalation: Inhalation of electrolyte solution mist will severely irritate the nose and throat.

Medical Conditions Aggravated by Exposure: Persons with pre-existing eye, skin, or respiratory conditions may be more susceptible to the corrosive effects of the electrolyte solution.

HMS Ratings: Health: 1, Fire: 1, Physical Hazard: 0 (Hazard Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe, * = Chronic hazard)

Section 4 - First Aid Measures

Eyes: If exposed to electrolyte solution, seek immediate medical attention! Flush eyes immediately with water for at least 15 minutes.

Skin: If exposed to electrolyte solution, remove contaminated clothing. Immediately wash affected area with soap and water, and seek medical attention if irritation develops or persists.

Ingestion: Get immediate medical attention if electrolyte solution is ingested! DO NOT INDUCE VOMITING!

Inhalation: Get immediate medical attention if electrolyte solution mist is inhaled! Remove source of contamination or move affected person to fresh air.

Section 5 - Fire Fighting Measures

Flash Point: NA

Upper Flammable Limit (UFL): NA

Auto Ignition: NA

Rate of Burning: NA

Method Used:

Lower Flammable Limit (LFL): NA

Flammability Classification: NA

General Fire Hazards: The sealed unit is not considered to be flammable, but the casing and some internal components may burn if involved in a fire. Short circuits can cause arcing/sparks that can ignite flammable materials. Improper charging can cause unit to vent hydrogen gas, that if concentrated, poses a fire/explosion hazard. If exposed to extreme heat from a surrounding fire, the sealed unit may rupture, releasing corrosive electrolyte solution.

Hazardous Combustion Products: Carbon monoxide, carbon dioxide, various metal oxides.

Extinguishing Media: Carbon dioxide, water fog or stream.

Fire Fighting Equipment/Instructions: Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 1, Fire: 1, Reactivity: 0 (Hazard Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe)

Section 6 - Accidental Release Measures

Containment Procedures: Intact modules do not pose a leak or spill hazard. Damaged modules may leak corrosive alkaline electrolyte.

Clean-Up Procedures: Wear impervious gloves and eye protection. For electrolyte leaks, neutralize with dilute acetic or hydrochloric acid, then wipe up with absorbent paper towels.

Evacuation Procedures: Keep unnecessary personnel away.

Special Procedures: Contact local regulatory authorities for advice regarding disposal of cleanup materials.

Section 7 - Handling and Storage

Handling Procedures: For damaged modules, do not breathe fumes or vapors, and prevent electrolyte contact with eyes and skin. Wash thoroughly after handling damaged modules.

Storage Procedures: Store in a well-ventilated place away from heat and flame. Prevent short-circuit conditions.

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Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

General Product Information: Follow all applicable exposure limits.

Component Exposure Limits:

Nickel (as metal and compounds) (7440-02-0)

ACGIH: 1.5 mg/m³ TWA (inhalable fraction)
OSHA: 1 mg/m³ TWA
NIOSH: 0.015 mg/m³ TWA

Copper (7440-50-8)

ACGIH: 0.2 mg/m³ TWA (fume); 1 mg/m³ TWA (dusts and mists, as Cu)
OSHA: 0.1 mg/m³ TWA (fume, dusts, mists as Cu)
NIOSH: 1 mg/m³ TWA (dusts and mists)

Potassium hydroxide (1310-58-3)

ACGIH: 2 mg/m³ Ceiling
OSHA: 2 mg/m³ Ceiling
NIOSH: 2 mg/m³ Ceiling

Engineering Controls: Not ordinarily required.

PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face: Not ordinarily required. Chemical goggles or safety glasses with side shields should be worn when handling a damaged module.

Skin: Not ordinarily required. Wear impervious gloves when handling damaged module. Wash contaminated clothing before re-use.

Respiratory: Not ordinarily required.

General: Use good industrial hygiene practices when using this product. Eyewash fountain and safety shower should be available in the work area.

Section 9 - Physical & Chemical Properties

Appearance: Article	Odor: None
Physical State: Solid	pH: (electrolyte) > 10
Vapor Pressure: NA	Vapor Density: NA
Boiling Point: NA	Melting Point: NA
Solubility (H₂O): NA	Specific Gravity: NA

Section 10 - Chemical Stability & Reactivity Information

Chemical Stability: Intact modules are stable.

Chemical Stability Conditions to Avoid: Prevent short-circuiting across terminals, and temperatures exceeding 100 °C (212 °F).

Incompatibility: None.

Hazardous Decomposition: Improper charging may release hydrogen gas, causing fire/explosion hazard.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

Acute and Chronic Toxicity

General Product Information: As an article, the toxicological properties of this product have not been fully investigated. Potassium hydroxide solutions cause chemical burns to eyes, skin, and all mucous membranes.

Component Analysis - LD50/LC50

Steel (7439-89-6)

Oral LD50 Rat: 30 g/kg

Potassium hydroxide (1310-58-3)

Oral LD50 Rat: 273 mg/kg

Carcinogenicity

General Product Information: No information available for this product.

Component Carcinogenicity

Nickel (as metal and compounds) (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Carcinogen (Possible Select Carcinogen)
IARC: Monograph 49, 1990 (Group 2B (possibly carcinogenic to humans))

Chronic Toxicity: No information available for this product.

Epidemiology: No information available for this product.

Neurotoxicity: No information available for this product.

Mutagenicity: No information available for this product.

Teratogenicity: No information available for this product.

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Section 12 - Ecological Information

Ecotoxicity

General Product Information: Intact module is not expected to be harmful to aquatic life. Prevent discharge of alkaline electrolyte from damaged modules to natural waters.

Component Analysis - Ecotoxicity - Aquatic Toxicity

Nickel (as metal and compounds) (7440-02-0)

Test & Species	Conditions
96 Hr LC50 rainbow trout (adults)	31.7 mg/L
96 Hr LC50 fathead minnow.....	3.1 mg/L
72 Hr EC50 freshwater algae (4 species).....	0.1 mg/L
96 Hr LC50 water flea.....	510 µg/L

Copper (7440-50-8)

Test & Species	Conditions
96 Hr LC50 fathead minnow.....	23 µg/L
96 Hr LC50 rainbow trout	13.8 µg/L
96 Hr LC50 bluegill.....	236 µg/L
72 Hr EC50 freshwater algae (Scenedesmus subspicatus) .	120 µg/L
96 Hr LC50 water flea.....	10 µg/L
96 Hr LC50 water flea.....	200 µg/L

Potassium hydroxide (1310-58-3)

Test & Species	Conditions
24 Hr LC50 mosquito fish.....	80.0 mg/L

Environmental Fate: Intact module will persist in environment. Alkaline electrolyte from damaged modules will rapidly neutralize, posing only short term hazard to aquatic life.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions

General Product Information: Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes. Spilled electrolyte solution is a RCRA Corrosive Waste (D002).

Component Waste Numbers: No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions: Spent or damaged modules should be recycled if possible. Do not incinerate, puncture, or attempt to disassemble modules. Consult with Local, State, or Federal Regulatory agencies for advice regarding recycling or environmentally sound disposal of this product.

Section 14 - Transportation Information

Shipping Description:

IATA: Battery, wet, filled with alkali, electric storage, 8, UN 2795, PG II
DOT: Battery, wet, filled with alkali, electric storage, 8, UN 2795, PG III

Shipping Labels Required:

IATA: CORROSIVE (class 8), and package orientation
DOT: CORROSIVE (class 8), and package orientation

Other Shipping Information:

IATA: Refer to IATA's Dangerous Goods Regulations for packaging specifications and exceptions. Note that the IATA PG is different than the DOT PG.
DOT: Refer to 49 CFR 173.159 for packaging specifications and exceptions. Note that the DOT PG is different than the IATA PG.

Identification Number: UN 2795

Hazard Class: 8

Section 15 - Regulatory Information

US Federal Regulations

A. General Product Information: Components of this product have been checked against the non-confidential TSCA inventory by CAS Registry Number. Components not identified on this non-confidential inventory are either exempt from listing (i.e. polymers, hydrates) or are listed on the confidential inventory as declared by the supplier. All components listed in this product appear on the Canadian DSL/NDSL.

B. Component Analysis: This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Nickel (as metal and compounds) (7440-02-0)

SARA 313: 0.1 percent de minimis concentration
CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Copper (7440-50-8)

SARA 313: 1.0 percent de minimis concentration
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)

Potassium hydroxide (1310-58-3)

CERCLA: 1000 lb final RQ; 454 kg final RQ

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Section 15 - Regulatory Information - continued

C. Component Marine Pollutants: This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	DOT regulated severe marine pollutant

State Regulations

A. General Product Information: Other state regulations may apply. Check individual state requirements.

B. Component Analysis - State: The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	MA	MN	NJ	PA	RI
Nickel (as metal and compounds)	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Steel	7439-89-6	Yes	No	No	No	No	No
Carbon	7440-44-0	No	No	No	No	No	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Potassium hydroxide	1310-58-3	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Nickel (as metal and compounds)	7440-02-0	0.1% (English Item 1126, French Item 1193)
Copper	7440-50-8	1% (English Item 433, French Item 578)
Potassium hydroxide	1310-58-3	1% (English Item 1335, French Item 996)

Additional Regulatory Information

A. General Product Information: No information available for the product.

B. Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Nickel (as metal and compounds)	7440-02-0	Yes	DSL	EINECS
Steel	7439-89-6	Yes	DSL	EINECS
Water	7732-18-5	Yes	DSL	EINECS
Carbon	7440-44-0	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Potassium hydroxide	1310-58-3	Yes	DSL	EINECS

Section 16 - Other Information

Other Information: The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws. KBI/Kold-Ban International, Ltd. assumes no responsibility for any kind of loss or damage arising from use of this data.

MSDS History:

Revision 1.0000: New Material Safety Data Sheet 10 October 2003.

Revision 1.1000: Remove Print Date, Change Manufacturer's Part Numbers, condense type to fit on four pages instead of seven pages, add "weight" to percent in Section 2.

Revision 1.2000: Revised Section 14 to include information for IATA and package orientation label required. Added PG to the Key/Legend.

Revision 1.3000: Changed Issued Date to 04/19/07.

Revision 1.4000: Added additional Manufacturer's Part Numbers.

Revision 1.5000: Added additional Manufacturer's Part Numbers, Changed Issued Date to 03/08/10.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; mg/Kg = milligrams per Kilogram; mg/L = milligrams per Liter; mg/m³ = milligrams per Cubic Meter; MSHA = Mine Safety and Health Administration; NA = Not Applicable or Not Available; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PG = Packing Group; SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit; TDG = Transport Dangerous Goods; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System.

This is the end of MSDS # KBI-131197