

# MATERIAL SAFETY DATA SHEET

## Lithium Ion Battery; Lithium Polymer Battery PoliFlex

To be used with Demi LED Curing Light

### 1 - IDENTIFICATION

**Manufacture By:** VARTA Microbattery  
**Distributor:** Kerr Corporation  
**Address:** 1717 West Collins Avenue  
**City, State, Zip:** Orange, CA 92867-5422  
**Telephone:** 1-800-KERR-123  
**Emergency:** Chemtrec 1-800-424-9300  
**Date Prepared:** July 13, 2007

#### Legal Remark (U.S.A)

Material Safety Data Sheet (MSDS) are a sub-requirements of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of hazardous chemical, and does not pose a physical hazards or health risk to employees.

Because these product is defined as "article", is exempt from the requirements of the Hazardous Communication Standard, hence this "Safety information" is provided as a service to our customers.

### 2 - COMPOSITION INFORMATION

#### Hazardous Ingredients

Material	CAS	Hazard	Contents/Ingredients
Graphite	7782-45-5	-	10-30 %
Lithium Metal Oxide	12190-79-3	Harmful	20-50 %
Organic Electrolyte, Consisting of LiPF <sub>6</sub> And organic carbonates		Flammable Corrosive	10-20 %
Copper		-	2-15 %
Aluminum		-	2-20 %
Polymer		-	5-10 %
Stainless Steel/nickel		-	0-20 %

**Important Information: The battery is sealed hermetically. The ingredients have no hazard potential, except when the battery is violated or dismantled.**

### 3 - PHYSICAL AND CHEMICAL PROPERTIES

Not applicable if closed.

### 4 - FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media:** Cold water and dry powder in large amount are applicable for burning lithium batteries. Metal extinction powder, rock salt or dry sand are suitable if only a few batteries are involved.

**Conditional applicable extinguishing media:** Carbon dioxide is only applicable for incipient fire. Do not use warm or hot water

**Special protection equipment during fire-fighting:** Contamination cloth including breathing apparatus

**Special Hazard:** At contact of electrolyte with water hydrofluoric acid may be formed. In this case take make sure you have good ventilation.

### 5 - REACTIVITY DATA

**Stability:** Stable under normal use.

**Conditions to Avoid:** Avoid heating above 100°C the risk of rupture occurs and strong oxidizers and strong acids.

### 6 - TOXICOLOGICAL INFORMATION

Under normal conditions (during charge or discharge) release of ingredients does not occur.

Swallowing of a battery can be harmful. Call the local Poison Control Center for advice and follow-up.

### 7 - EMERGENCY FIRST AID PROCEDURES

**Skin:** Flush affected areas with plenty of water. Dab off with polyethylene glycol 400. Remove contaminated cloth immediately. Seek medical assistance.

**Eyes:** Flush with water for 15 minutes. Contact physician.

**Inhalation:** Remove to fresh air. Seek medical assistance.

**Ingestion:** Drink plenty of water. Avoid vomiting. Seek medical assistance

### 8 - PRECAUTIONS FOR SAFE HANDLING & USE

**Steps to be taken in case material is released or spilled:** Bind released ingredients with powder (rock, salt, sand) then clean with water. Avoid leached substances to get into the earth, canalization or waters.

**Waste disposal method:** Dispose of in accordance with all federal, state and local regulations.

**Precautions to be taken in handling and storing:** avoid short circuiting the battery, do not use damage batteries. Do not store close to heating.

**Other precautions:** Use according to directions.

### 9 - EXPOSURE CONTROL/PERSONAL PROTECTION

Under normal conditions (during charge and discharge) release of ingredients does not occur. In the event of release of ingredients, the following TLVs have to be considered.

Material	TLV*
Cobalt and Compounds:	0.02 mg/m <sup>3</sup> (TWA)

\*Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents, 2002.

### 10 - TRANSPORTATION INFORMATION

Batteries sold by VARTA Microbattery are not subjected to the transport regulations of dangerous good, because they fulfill the following requirements (Special provision ADR 188, IATA A45, IMDG 188, DOT/49 CFR Provision 173.185.

LED II  
 Battery Pack

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SANYO Batteries  
 SANYO Energy  
 2056 Sanyo Ave.  
 San Diego, CA 92154

Telephone No.: (619) 661-4558  
 www.sanyobatteries.com  
 In case of emergency contact:  
 CHEMTREC at (800) 424-9300

Date of Preparation: 8/23/03

**Section I -- Product Identification**

Product Name: Nickel Metal Hydride Battery  
 Trade Name: Twicell Nominal Voltage: 1.2V  
 Chemical System: Nickel/Metal Hydride Designated for Recharge:  
 X Yes \_\_\_ No

**Section II -- Composition / Information on Ingredients**

IMPORTANT NOTE: The product is a manufactured article as described in 29 CFR 1910.1200. 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. The battery cell should not be opened or exposed to heat because exposure to the following ingredients contained within could be harmful under some circumstances. The following information is provided for the user's information only.

Chemical Name	CAS No.	OSHA PEL (mg/m <sup>3</sup> )	ACGIH TLV (mg/m <sup>3</sup> )
Nickel (powder)	7440-02-0	1 TWA	1 TWA
Nickel hydroxide	12054-48-7	1 TWA	1 TWA
Cobalt	7440-48-4	0.1 TWA	Dust & Fume 0.005
Manganese	7439-96-5	Fume: 5 Ceiling Limit	Dust: 5 Fume: 1
Lanthanum	7430-91-0	NA	NA
Cerium	7440-45-1	NA	NA
Neodymium	7440-00-6	NA	NA
Potassium hydroxide	1310-58-3	NA	2 Ceiling Limit
Sodium hydroxide	1310-73-2	2 TWA	2 Ceiling Limit
Lithium hydroxide	1310-65-2	NA	NA

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

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- Notes: 1. Concentrations vary depending on the state of charge or discharge.  
2. TWA is the time weighted average concentration over an 8-hour period.

### Section III — Physical Data for Battery

Melting point (°F) NA	Boiling point (°F) NA	% Volatile by Volume NA
Vapor Pressure (mm Hg) NA	Evaporation Rate	Vapor Density (Air = 1) NA
Specific Gravity (H <sub>2</sub> O) NA	Solubility in Water NA	Appearance and Odor No Odor

### Section IV - Fire and Explosion Hazard Data

Flash Point: NA

Lower Explosive Limit: NA

Upper Explosive Limit: NA

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

Special Fire Fighting Procedures: Exposure to temperatures of above 212°F can cause venting of the liquid electrolyte. Internal shorting could also cause venting of the electrolyte. There is potential for exposure to iron, nickel, cobalt, rare earth metals (cerium, lanthanum, neodymium, and praseodymium), manganese, and aluminum fumes during fire; use self-contained breathing apparatus.

### Section V - Health Hazard Data

Threshold Limit Values: See Section II

Effects of a 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, exposure to the constituents may occur. Inhalation of cobalt dusts may result in pulmonary conditions.

**Ingestion:** If the battery case is breached in the digestive tract, the electrolyte may cause localized burns.

**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. 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.

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**Carcinogenicity:**

Nickel has been identified by the National Toxicology Program (NTP) as reasonably anticipated to be a carcinogen. Cobalt has been identified by IARC as a 2B carcinogen.

**Other Effects of Repeated (Chronic) Exposure:**

Chronic overexposure to nickel may result in cancer; dermal contact may result in dermatitis in sensitive individuals.

**Medical Conditions Aggravated by Overexposure:**

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.

**Emergency and First Aid Procedures:**

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

**Skin:** If the internal cell materials of an opened battery cell comes into contact with the skin, immediately flush with water for at least 15 minutes.

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

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

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**Section VI - Reactivity Data**

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The batteries are stable under normal operating conditions.

Hazardous polymerization will not occur.

Hazardous decomposition products: oxides of nickel, cobalt, manganese, lanthanum, and cerium.

Conditions to avoid: heat, open flames, sparks, and moisture.

Potential incompatibilities (i.e., materials to avoid contact with): The battery cells are encased in a non-reactive container, however, if the container is breached, avoid contact of internal battery components with acids, aldehydes, and carbonate compounds.

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**Section VII - Spill and Leak Procedures**

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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 in accordance with applicable state and federal regulations.

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**Section VIII - Safe Handling and Use (Personal Protective Equipment)**

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**Ventilation Requirements:** Not required under normal use.

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Respiratory Protection: Not required under normal use.  
Eye Protection: Not required under normal use.  
Gloves: Not required under normal use.

### Section IX- Precautions for Safe Handling and Use

**Storage:** Store in a cool 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 encapsulation or sealing requirements, consult your SANYO Energy Corp. 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 of 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. If soldering or welding to the case of the battery is required, consult your Sanyo Energy Corp. 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.

**Labeling:** If normal label warnings are not visible, it is important to provide a device label stating:

**CAUTION:** Do not dispose in fire, mix with other battery types, charge above specified rate, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

### Section X - Recycling and Disposal

SANYO encourages battery recycling. Our Nickel Metal Hydride batteries are not defined by the federal government as hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling through Kinsbursky Brothers Inc, at (800)548-8797 or see their website at [www.kinsbursky.com](http://www.kinsbursky.com).

DO NOT INCINERATE or subject battery cells to temperatures in excess of 212°F. Such treatment can cause cell rupture.

### Section XI - Transportation

SANYO sealed Nickel Metal Hydride 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 Organization (ICAO), the International Air Transport Association (IATA) or the International Maritime Dangerous Goods regulations (IMDG). More information concerning shipping, testing, marking and packaging can be obtained from Labelmaster at <http://www.labelmaster.com>. The only DOT requirement for shipping Nickel Metal Hydride 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.

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