

## Material Safety Data Sheet

### 1. Identification of the substance/mixture and of the company/undertaking

<b>Product name:</b>	Ni-MH battery, rechargeable
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Size	Nominal Voltage	Capacity	Energy content
LR06, Mignon (AA)	1.2 V	2300 mAh	2.76 Wh

<b>Manufacturer:</b>	Conrad Electronic SE
<b>Address:</b>	Klaus-Conrad-Str. 1, D-92240 Hirschau
<b>Telephone:</b>	+49 (0) 9604 / 40 - 8988
<b>Date of issue:</b>	19.09.2016

### 2. Hazardous Ingredient

#### IMPORTANT NOTE:

The product is a manufactured article as described in 29 CFR 1910.1200. The Ni-MH battery cell is contained 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 Ni-MH battery cell. The Ni-MH 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 user's information only.

Chemical Name	Cas. No.	DEHA PEL (mg/m <sup>3</sup> ) ACGIH	TIV (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	0.1TWA	Dust & Fume 0.005
Manganese	7439-96-5	Fume: 5 Ceiling Limit	Dust: 5 Fume: 1
Lanthanum	7439-91-0	NA	NA
Cerium	7440-45-1	NA	NA
Neodymium	7440-00-8	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

Chemical system: Nickel/Metal Hydride

Designed for recharge: yes

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

Note:

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

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### 3. Physical Data for NiMH battery

Melting point:	NA
Boiling point:	NA
% Volatile by Volume:	NA
Vapor Pressure (mm Hg):	NA
Evaporation Rate Vapor:	NA
Density (Air=1):	NA
Specific Gravity (H2O):	NA
Solubility in Water:	NA
Appearance and Odor:	No odor

### 4. 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 100 °C (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.

### 5. First Aid Measures

If electrolyte leakage occurs and makes contact with skin, wash with plenty of water immediately.

If electrolyte comes into contact with eyes, wash with copious amounts of water fifteen (15) minutes, and contact a physician.

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### 6. 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 Ni-MH battery case. However, should the batteries be exposed to extreme heat or pressures causing a breach the Ni-MH battery cell case, exposure to the constituents may occur. Inhalation of cobalt dusts may result in pulmonary conditions.

##### Ingestion:

If the Ni-MH 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 Ni-MH 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 Ni-MH battery may result in severe irritation and chemical burns.

##### 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 Ni-MH battery cell come 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 Ni-MH battery come into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

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### 7. Reactivity Data

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 Ni-MH battery cells are encased in a non-reactive container; however, if the container is breached, avoid contact of internal Ni-MH battery components with acids, aldehydes, and carbamate compounds.

### 8. Spill and Leak Procedures

Spill and leaks are unlikely because cells are contained in an hermetically-sealed case. If the Ni-MH 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.

### 9. Safe Handling and Use (Personal Protective Equipment)

**Ventilation Requirements:**

Not required under normal use.

**Respiratory Protection:**

Not required under normal use.

**Eye Protection:**

Not required under normal use.

**Gloves:**

Not required under normal use.

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### 10. Precautions for Safe Handling and Use

#### Storage:

Store in a cool place, but prevent condensation on cell or Ni-MH battery terminals. Elevated temperatures may result in reduced Ni-MH battery life. Optimum storage temperatures are between -35 °C and +35 °C (-31 °F and 95 °F).

#### Mechanical Containment:

If there are special encapsulations or sealing requirements, consult us about possible cell hazard precautions or limitations.

#### Handling:

Accidental short circuit will bring high temperature elevation to the Ni-MH battery as well as shorten the Ni-MH battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the Ni-MH batter 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 Ni-MH battery is required, consult us for proper precautions to prevent seal damage or external short circuit.

#### Charging:

This Ni-MH battery is designed for recharging. A loss of voltage and capacity of batteries due to self-discharge during prolonged storage is unavoidable. Charge Ni-MH 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 Ni-MH battery types, charge above specified rate, connect improperly, short circuit, which may result in overheating, explosion or leakage of cell contents.“

### 11. Measures for Fire Extinction

In case of fire, it is permissible to use any of extinguishing medium on these batteries or their packing material. Cool exterior of batteries if exposed to fire to prevent rupture.

Fire fighters should wear self-contained breathing apparatus.

### 12. Ecological Information

N.A.

### 13. Recycling and Disposal Information

We encourage Ni-MH battery recycling. Our batteries are not defined by the federal government as hazardous waste and are safe for disposal in the normal municipal waste stream.

DO NOT INCINERATE or subject Ni-MH battery cells to temperatures in excess of 100 °C (212 °F). Such treatment can cause cell rupture.

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### 14. Transportation Information

Our sealed batteries are considered to be “dry cell” batteries and are not subject to dangerous goods for the purpose of air transportation by the U.S. Department of Transportation (DOT), the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), the IAT dangerous goods regulations 2014 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>.

IATA requires that batteries being transported by air must be protected from short-circuiting and protected from movement that could lead to short-circuiting.

According to the 54th edition 2014, it complies to the IATA-DGR-Special Provision A123 dangerous goods regulations, and IMD Special Provision 304.

### 15. Regulatory Information

Special requirement be according to the local regulatoryies.

### 16. Other Information

Note:

1. This MSDS is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness.

Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

2. Valid supporting document(s) proving that the Ni-MH battery complies with all the IATA DGR.

Valid supporting document(s) can be either one of the following document(s) issued by Ni-MH battery manufacturer or approved laboratory. Please note each valid supporting document should mark with reference number that matches with shipment reference number on MAWB.

- 1) Material Safety Data Sheet (MSDS) or Product Safety Data (PSDS);
- 2) Laboratory Test Report; or
- 3) Certificate for Safe Transport of Air Cargo

3. “Nature and Quantity of Goods” box of MAWB to show. “Ni-MH battery, Not Restricted as per Special Provision A45”.

4. Declaration remark in the “Handing information” box of MAWB to show.

- 1) “Shipment contains no item listed under IATA DGR Special Provision A154 and it meets al the requirements of SP A45 including the passing of the UN 38.3 tests”; and
- 2) Mark supporting document with the MSDS/PSDS/Lab Test/Certificate reference number(e.g. AB CDE 123) on the MAWB for validation check.