BE·POWER
Battery and Energy Modules

MATERIAL SAFETY DATA SHEET

BE-POWER GmbH / Nickel-Metal Hydride Rechargeable Battery Pack

Date of Issue: 16th of October 2010.

Safety Data Review Date: 24.08.2022

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1. General Information

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Item Name: Ni-MH Battery
Part Number: 14.227.0244
Trade Name: Nickel-Metal Hydride Battery 9S1P
Production Code: mm/yy
Typical Capacity: 0.70Ah
Typical Voltage: 10.8V
Typical Energy Density: 7.56Wh
Type of Container: shrink tube
Net Unit Weight: approx. 130g
Company Name: BE-POWER GmbH
Company Street: Ruhberg 8
Company City: D-35463 Fernwald
Company Country: Germany
Company Phone: ++49-(0)6404-20515-0
Company fax: ++49(0)6404-20515-29
In Case of Emergency: ++49-(0)6404-205150
Hazard Classification: None

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2. Hazards Identification Information

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As a solid, these chemicals and metals are contained in a sealed container. For consumer use, exposure to hazardous in gradients is not expected with normal use.
Adequate hazard warnings are included on both the battery and on the package.
Do not short circuit, puncture, incinerate, crush, immerse, force discharge or expose to temperatures above the declared operating temperature range of the product. Risk of fire and explosion.
Under normal conditions of use, the electrode material and liquid electrolyte contained are not exposed to the outside, provided the battery integrity is maintained and seals remain intact.
Risk of exposure is given only in the case of abuse (mechanical, thermal) treatment. Electrolyte leakage, electrode materials reaction with moisture/water or battery vent/explosion/fire may follow, depending upon the circumstance.

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3. Ingredients Identification Information

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Ingredient: **Nickel Powder**
w/w [%]: about 2%
CAS Number: 7440-02-0
LD_{50} (mg/kg): 9000 (rat)
LC_{50}: (mg/l): 100/96h (fish)

Hazard Symbol: 

Ingredient: **Nickel-II-Hydroxide**
w/w [%]: about 30%
CAS Number: 12054-48-7
LD_{50} (mg/kg): 1600 (oral)
LC_{50}: (mg/l): N/AV

Hazard Symbol: 

Ingredient: **Cobalt Monoxide**
w/w [%]: about 3%
CAS Number: 1307-96-6
LD_{50} (mg/kg): 202 (oral-rat)
LC_{50}: (mg/l): N/AV

Hazard Symbol: 

Ingredient: **Potassium Hydroxide**
w/w [%]: about 2%
CAS Number: 1310-58-3
LD_{50} (mg/kg): 273 (oral-rat)
LC_{50}: (mg/l): 80/96h (fish)

Hazard Symbol: 

Ingredient: **Sodium Hydroxide**
w/w [%]: about 2%
CAS Number: 1310-73-2
LD_{50} (mg/kg): 500 (oral-rat)
LC_{50}: (mg/l): 189/48h (fish)

Hazard Symbol: 

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Ingredient: **Hydrogen Absorbing Alloy AB_5**
w/w [%]: about 38%
CAS Number: Lanthanum: 7439-91-0
Cerium: 7440-45-1
Neodymium: 7440-00-8
Praseodymium: 7440-10-0
LD_{50} (mg/kg): N/AV
LC_{50}: (mg/l): N/AV
Hazard Symbol:

Ingredient: **Iron**
w/w [%]: about 10%
CAS Number: 7439-89-6
LD_{50} (mg/kg): N/AV
LC_{50}: (mg/l): N/AV
Hazard Symbol:

Ingredient: **Others: Graphite, PP-fiber Separator, Lithium Hydroxide, Fluon**
w/w [%]: about 15%
CAS Number: 7439-89-6
LD_{50} (mg/kg): N/AV
LC_{50}: (mg/l): N/AV
Hazard Symbol:

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4. First-Aid Procedures

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Inhalation: In case of excessive inhalation due to leaking batteries take fresh air. Inhalation of Cobalt dusts may result in pulmonary conditions.

Skin Contact: If exposed to a leaking battery, remove contaminated clothing. Wash exposed areas with plenty of running water and soap. If irritation occurs, consult a physician.

Eye Contact: If a battery is leaking and material contact the eyes, flush immediately with running water for at least 15 minutes. Obtain medical advice at once.

Ingestion: If exposed to a leaking battery, rinse mouth and surrounding areas with running water for at least 15 minutes. Give plenty of water to drink. Do not induce vomiting. Obtain medical advice.

Most important symptoms and hazardous effects: Chemical burns

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5. Fire and Explosion Hazard Data / Fire Fighting Procedures

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Suitable extinguishing media: Carbon Dioxide (CO_2), foam, dry chemical powder.
Never use a direct water jet.
Exposure hazards from combustion products: In case of fire, Carbon Dioxide, Carbon Monoxide and toxic Organic components will be generated.
Wear full protective clothing.
Use self-contained equipment.

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6. Spill Disposal Procedures

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Overview: Evacuate area if fire is present or likely. Spills of this electrolyte from cells pose a risk to the safety of responders.
Remove all sources of ignition. Electrolyte on surfaces causes slipperiness.
Personal precautions: For all spills, protect skin and eyes from contact with electrolyte.
Environmental precautions: Prevent from migration into natural waterways. Absorb spilled material with non-reactive absorbent such as Vermiculite
Clean-Up Procedures: Evacuate spill area immediately and remove sources of ignition. DO NOT touch spilled material. Clean-up personnel must be trained in the safe handling of this product. If possible, ventilate area by ventilation system. Place cells into individual plastic bags and then place into appropriate containers and close tightly for disposal. Immediately transport closed containers outside.
Plastic drums are suitable for storage of damaged cells until proper disposal can be arranged.

Dispose in accordance with applicable state and federal regulations.

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7. Precautions for Safe Handling and Use

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Handling Procedures: Short circuit generates high temperature evaluation. Avoid short circuit since the heat can burn skin and even rupture the battery cell case.
Obey the common known rules and precautions for handling with chemicals. Avoid mechanical and electrical abuse. Do not short battery or install incorrectly. Batteries may explode, pyrolyze or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries according to equipment instructions. Do not mix battery systems, such as Alkaline or Zinc-Carbon. Replace all batteries at the same time. Do not remove battery labels. Keep batteries away from children.

Storage: Store in a cool, dry, well-ventilated area, out of direct sunlight and away from heat and ignition sources. Keep storage area clear of burnable materials (e.g. old rags, cardboard). Lighted cigarettes, matches, or any other ignition sources should not be allowed around indoor or outdoor storage areas. Inspect all incoming containers to make sure they are properly labelled and not damaged. Keep quantity stored as small as possible. Store away from water, strong oxidizing agents, strong reducing agents, strong acids and strong alkalis. Store in suitable, labelled containers (usually the shipping container). Keep containers tightly closed. Avoid stacking of containers. Protect from damage. Keep empty containers in separate storage area. Empty containers may contain hazardous residues. Keep closed. Store small quantities in approved fireproof flammables cabinet or storage room. Store flammable materials according to occupational health and safety regulations and fire and building codes, which will describe the kind of storage area and the type of storage containers for a specified amount of the material.

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Store in an isolated fireproof building, if possible. Ground floor storage facilities are usually recommended. Store within temperature range recommended by battery manufacturer/supplier. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas. Inspect periodically for damage or leaks. Have appropriate fire extinguishers and spill clean-up equipment in or near storage area.

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

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8. Exposure Controls Measures and Procedures

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Control parameters:
8-hour TWAs: None
Short-term exposure limits: None
Maximum exposure limits: None
Biological mark: None

Personal protective equipment:

Respiratory Protection:	None under normal use conditions
Ventilation:	General ventilation under normal use conditions
Skin and body protection:	None under normal use conditions. Wear Neoprene, Rubber or Nitrile gloves when handling leaking batteries
Eye Protection:	None under normal use conditions. Wear safety glasses when handling leaking batteries
Other Protective Equipment:	Keep batteries away from children

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9. Physical/Chemical Characteristics

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Physical State: Solid
Colour: white
Odour: None
Impact sensitive: No
Relative Density: N/APP
Flammability: None
Lower Explosive Limit: None
Upper Explosive Limit: None
Boiling Point: N/APP
Melting Point: N/APP
Vapour Pressure (mm Hg): N/APP
Vapour Density (air=1): N/APP
Decomposition Temperature: >200°C
Evaporation Rate: N/APP
Solubility in water: Insoluble, May short circuit
Percent Volatile by Volume: None
Viscosity: N/APP

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pH value: N/APP
Corrosion Rate (IPY): None
Autoignition Temperature: N/AV

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10. Stability and Reactivity Data

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Stability: Stable
Thermal decomposition: Batteries may burst and release hazardous decomposition compounds when exposed to a hot spot. like Hazardous fumes of Zinc, Manganese, Hydrogen gas, caustic of Potassium Hydroxide, and other toxic sub- products may be generated.
Substances to avoid: Strong oxidation agents.
Hazardous reactions: Contents incompatible with strong oxidizing agents.
Hazardous decomposition products: Hazardous fumes of Zinc, Manganese, Hydrogen gas, caustic of Potassium Hydroxide, and other toxic sub- products.

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11. Toxicological Information

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Regarding ingredients of battery: See section 2. and 3. of this MSDS.
Regarding proper battery: Acute toxicity: None
Local effects: None
Sensitization: None
Chronic toxicity or long-term Toxicity: None

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12. Ecological Information

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Possible environmental effects/ environmental mobility: N/AV
Environmental toxicity: N/AV
Biodegradability: None

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13. Disposal Data

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Spent batteries are not considered hazardous waste.

DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Some jurisdictions require recycling of batteries.

German Regulations: Dispose in Accordance with the German battery law:
"Gesetzt zur Neuregelung der abfallrechtlichen Produktverantwortung für Batterien und Akkumulatoren"
Issued: Bundesgesetzblatt Jahrgang 2009, Teil I Nr. 36, 30. June 2009

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14. Transportation Data

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Sealed Ni-MH batteries are considered to be "Dry Cell" batteries and are not subject to Dangerous Goods

regulations for the purpose of transportation by U.S. Department of Transportation (DOT), the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA) or European Road Transport regulations (ADR). The only DOT requirement for shipping Ni-MH is Special Provision 130 which states: “Batteries, dry cells 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. For air transportation Special Provision A123 and A199 has to be considered accordingly.

International Maritime Dangerous Goods regulations (IMDG): Similar is valid for loads having a gross weight of <100kg. In case of a gross weight of 100kg or higher the load has to be declared as dangerous goods Class 9 based on UN3496.

The specific statutory regulations must be considered in its actual valid edition.

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15. Regulatory Information

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Consider specific regulations of countries to which these batteries are distributed to
Consider local hazardous waste disposal laws.
This product is made with no detectable amount of Mercury, Cadmium or Lead
This product is made in accordance with ROHS regulation
This product is not subject to REACH regulation

EU and German Regulations:
CAS Number: N/APP
EINECS: N/APP
EU Classification: Not Classificable
EU-OSHA: N/APP
LD_{50}: N/APP
LC_{50}: N/APP
R-Phrase: None
S-Phrase: None
Labels: According to European Battery Directive put into force by German Battery Law “*“Gesetz zur Neuregelung der abfallrechtlichen Produktverantwortung für Batterien und Akkumulatoren”*
Issued: Bundesgesetzblatt Jahrgang 2009, Teil I Nr. 36, 30. June 2009;
Amendment: 01. June 2012

⇨ Art Work: energy density, capacity, battery technology, crossed dust bin, Hg, Cd, Pb symbol if existing.

The specific statutory regulations must be considered in its actual valid edition.

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16. Others

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The above information is believed to be correct but does not purport to be complete or covering all eventualities. It shall be used only as a guide.
For further assistance contact BE-POWER GmbH