

Product Safety Data Sheet

Power Diagnostix Built-in Battery Pack for Instruments of ICMseries

Nickel Metal Hydride Batteries

Rev. e.1.00, November 2017

Please note: Power Diagnostix' built-in battery pack referenced herein is an exempt article and is not subject to the OSHA Hazard Communication Standard requirement. Hence, a Material Safety Data Sheet (MSDS) is not required for this product. This sheet is provided as a service to our customers, only.

Manufacturer Information

Manufacturer: Power Diagnostix Instruments GmbH
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Hazards Identification

GHS classification: Not applicable

Signal Word: Not applicable

Hazard Classification: Carcinogenic Category 3 R40, sensitizing R42/43, Xn R20/22, C R35, N R50-53¹

Under normal conditions of use, the batteries inside the instrument's enclosure are hermetically sealed. If the battery casing as well as the security vent are maintained, the ingredients are not expected to pose a significant risk to man or the environment.

On some bad using conditions (high over-charge, inverse charge, external short circuit) and in case of a bad functioning, some electrolyte leakage can occur by the safety vent. In these cases, the risk is the caustic nature of electrolyte.

The classification above is based on the contents being considered as a preparation in accordance with directive 1999/45/EC.

Ingestion: Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

¹ For the full text of the R phrases mentioned in this section, see section "Regulatory Information".

Inhalation: Contents of an open battery can cause respiratory irritation. Hypersensitivity to nickel can cause allergic pulmonary asthma.

Skin contact: Contents of an open battery can cause skin irritation and/or chemical burns. Nickel and nickel compounds can cause skin sensitization and an allergic contact dermatitis.

Eye contact: Contents of an open battery can cause severe irritation and chemical burns.

Ingredients

IMPORTANT NOTE: The batteries inside the instrument's enclosure should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

Component	Material	Formula	CAS #	EC #	Weight %
Positive Electrode	Nickel II Hydroxide	Ni(OH) ₂	12054-48-7	235-008-5	15–30%
Negative Electrode	Metal Hydride Alloy	AB5 Type ²	AB5 Type	AB5 Type	15–40%
Electrolyte	Potassium Hydroxide	KOH	1310-58-3	215-181-3	3–15%
	Cobalt Hydroxide	Co(OH) ₂	21041-93-0	244-166-4	2.5–7%

First Aid Measures

Ingestion: Do not induce vomiting or give food or drink. Call a Poison Control Centre for advice. Seek medical attention immediately.

Inhalation: Provide fresh air and seek medical attention.

Skin contact: Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.

Eye contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Fire Fighting Measures

If fire or explosion occurs when batteries are on charge, shut off power to charger.

In case of fire where nickel metal hydride batteries are present, apply a smothering agent such as METL-X, sand, dry ground dolomite, or soda ash, or flood the area with water. A smothering agent will extinguish burning nickel metal hydride batteries. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving nickel metal hydride batteries can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended.

Fire fighters should wear self-contained breathing apparatus. Burning nickel metal hydride batteries can produce toxic fumes including oxides of nickel, cobalt, aluminum, manganese, lanthanum, cerium, neodymium, and praseodymium.

² Components of AB5 alloy include: Lanthanum (La) – CAS# 7439-91-0, Cerium (Ce) – CAS#7440-45-1, Neodymium (Nd) – CAS#7440-00-8, Praseodymium (Pr) – CAS#7440-10-0)

Accidental Release Measures

To cleanup leaking batteries:

Ventilation requirements: Room ventilation may be required in areas where there are open or leaking batteries.

Eye protection: Wear safety glasses with side shields if handling an open or leaking battery.

Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.

Battery materials should be collected in a leak-proof container.

Handling and Storage

Storage: Store in a dry, cool, well ventilated place.. Elevated temperatures can result in shortened battery life.

Keep away from heat and sources of ignition.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult Power Diagnostix for precautionary suggestions. Batteries normally evolve hydrogen which, when combined with oxygen from the air, can produce a combustible or explosive mixture unless vented. If such a mixture is present, short circuits, high temperature, or static sparks can cause an ignition.

Do not obstruct safety release vents on batteries. Encapsulation (potting) of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the batteries inside the instrument's enclosure to lose energy and can cause the safety release vent to open.

Do not open the batteries inside the instrument's enclosure. The negative electrode material may be pyrophoric. Should an individual cell from a battery become disassembled, spontaneous combustion of the negative electrode is possible. This is much more likely to happen if the electrode is removed from its metal container. There can be a delay between exposure to air and spontaneous combustion.

Charging: This battery is made to be charged many times. Because it gradually loses its charge over a few months, it is good practice to charge battery before use. Use recommended charger. Improper charging can cause heat damage or even high pressure rupture. Observe proper charging polarity.

Exposure Control/Personal Protection

Ventilation requirements: Not necessary under normal conditions.

Respiratory Protection: Not necessary under normal conditions.

Eye protection: Not necessary under normal conditions.

Gloves: Not necessary under normal conditions.

Physical and Chemical Properties

Appearance (physical state, color, etc.):	Solid object
Upper explosive limits:	Not applicable
Lower explosive limits	Not applicable
Odor	No odor
Vapor pressure (mm Hg @ 25°C)	Not applicable
Odor threshold	No odor
Vapor density (Air = 1)	Not applicable
pH	Not applicable
Density (g/cm ³)	2.5 – 3.7
Melting point/Freezing point	Not applicable
Solubility in water (% by weight)	Not applicable
Boiling point @ 760 mm Hg (°C)	Not applicable
Flash point	Not applicable
Evaporation rate (Butyl Acetate = 1)	Not applicable
Flammability	Not applicable
Partition coefficient	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	Not applicable
Viscosity	Not applicable

Stability and Reactivity

Nickel metal hydride batteries do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

Toxicological Information

Under normal conditions of use, nickel metal hydride batteries are non-toxic.

Ecological Information

Issues such as ecotoxicity, persistence, and bioaccumulation are not applicable for the built-in battery of the ICMseries.

Disposal

Dispose of the batteries in accordance with all applicable federal, state, and local regulations. Appropriate disposal technologies include incineration and land filling.

Transportation

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in “strong outer packaging” that prevents spillage of contents. All original packaging for nickel metal hydride batteries has been designed to be compliant with these regulatory concerns.

The rechargeable Ni-MH 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). 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. The International Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under Special provision 304 which says "Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc carbon, nickel metal hydride and nickel-cadmium batteries."

We hereby certify that the consignment is not classified as dangerous goods under the current edition of the IATA Dangerous Goods Regulations A199 under 56th Edition and all applicable carrier and governmental regulations. The International Maritime Organization (IMO) regulates them as a Class 9 dangerous good under UN 3496 and Special Provision 117 and 963 which allows a total quantity of less than 100 kg gross mass to be transported as non-regulated.

Regulatory Information

Batteries marketed by Power Diagnostix are not classified as dangerous goods by the US Department of Transportation or the major international regulatory bodies and are therefore not regulated.

SARA/TITLE III – The built-in batteries and their contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

Text of R phrases mentioned in section "Hazards Identification":

- R22: Harmful if swallowed.
- R20/22: Harmful by inhalation and if swallowed.
- R35: Causes severe burns
- R40: Limited evidence of a carcinogenic effect.
- R42/43: May cause sensitization by inhalation and skin contact.
- R43: May cause sensitization by skin contact.
- R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Notice: The information and recommendations above are made in good faith and are believed to be accurate at the date of preparation. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Power Diagnostix makes no warranty expressed or implied.