Nickel Metal Hydride Batteries Handling Precautions

Carefully read this instruction manual before using Nickel Metal Hydride batteries for the first time.

Important: For your safety and that of your customers observe all cautionary information provided in this manual. Save this manual for future reference. The following information is intended to highlight potential safety hazards that can be associated with the misuse, misapplication or damage to Nickel Metal Hydride cells/batteries. Please carefully evaluate the information in this section when using Nickel Metal Hydride batteries (single cell or packed cells) or when using or manufacturing equipment incorporating Nickel Metal Hydride batteries.

This manual is no substitute for your independent evaluation of equipment incorporating Nickel Metal Hydride batteries. Customers incorporating Nickel Metal Hydride batteries into their equipment must assure that their completed product has been properly designed, manufactured and tested. End users of equipment incorporating Nickel Metal Hydride batteries should also be provided with sufficient warnings and instructions on their safe operation. As appropriate, some or all of the following warnings and information should be incorporated by you into the instruction manual accompanying your equipment.

⚠ DANGER!

• Failure to carefully observe the following procedures and precautions can result in leakage of battery fluid (electrolyte), heat generation, bursting, fire and serious personal injury !

- Never dispose of Nickel Metal Hydride batteries in a fire or heat them.
Doing so may melt the insulation, damage the gas release vents or protective devices, ignite hydrogen gas, cause leakage of battery fluid (electrolyte), heat generation, bursting and fire.

- Do not connect the + (positive) and – (negative) terminals of Nickel Metal Hydride batteries together with electrically conductive materials, including lead wires. Do not transport or store Nickel Metal Hydride batteries with their uncovered terminals or connected with a metal necklace or other conductive material. Doing so may short circuit a battery, which would result in excessive current flow and possibly cause leakage of battery fluid, heat generation, bursting and fire. When carrying or storing batteries, use a special case.

- Only charge Nickel Metal Hydride batteries using those specific chargers that satisfy Moltech's specifications. Only charge batteries under the conditions specified by Moltech. Failure to follow proper charging procedures may cause excessive current flow, loss of control during charging, leakage of battery fluid, heat generation, bursting and fire.

- Never disassemble Nickel Metal Hydride batteries. Doing so may cause an internal or external short circuit or result in exposed material or battery reacting chemically with the air. It may also cause heat generation, bursting and fire. Also, this is dangerous as it may cause splashing of alkaline fluid.

- Never modify or reconstruct Nickel Metal Hydride batteries. Protective devices to prevent danger are built into batteries (single cell or packed cells). If these are damaged, excessive current flow may cause loss of control during charging or discharging of the battery, leakage of battery fluid, heat generation, bursting and fire.

- Never solder lead wires directly onto Nickel Metal Hydride cells, the heat of the soldering operation may melt the insulation, damage the gas release vents or protective devices, cause leakage of battery fluid, heat generation, bursting and fire.

- The + (positive) and – (negative) terminals of Nickel Metal Hydride batteries are predetermined. Do not force the terminal connection to a charger or equipment. If the terminals cannot be easily connected to the charger or equipment, check if the + (positive) and – (negative) terminals are correctly positioned. If the terminals are reversed during charging, the battery may be discharged rather than charged. Furthermore, reversed connections may cause abnormal chemical reaction in the battery, the flow of abnormal currents, leakage of battery fluid, heat generation, bursting and fire.

- The gas release vent which releases internal gas is located in the + (positive) terminal of the Nickel Metal Hydride battery. For this reason, never deform this section or cover or obstruct its gas release structure. If this section is deformed or covered or obstructed, the gas release vent will not function properly, possibly causing leakage of battery fluid, heat generation, bursting and fire.

- Do not directly connect Nickel Metal Hydride batteries to a direct power source or the cigarette lighter socket in a car. High voltage may cause excessive current flow, leakage of battery fluid, heat generation, bursting and fire.

- Do not use Nickel Metal Hydride batteries in any equipment other than those specified by Moltech. Depending on the equipment being used, doing so may cause abnormal current flow, leakage of battery fluid, heat generation, bursting and fire.

• Nickel Metal Hydride batteries contain the strong colourless alkaline solution (electrolyte). The alkaline solution is extremely corrosive and will cause skin damage. If any fluid from Nickel Metal Hydride battery comes into contact with a user's eyes, they should immediately flush their eyes and wash them thoroughly with enough clean water from the tap or another source and consult a doctor urgently. The strong alkaline solution can damage eyes and lead to permanent loss of eyesight.

• When Nickel Metal Hydride batteries are to be incorporated in equipment or housed within a case, avoid air-tight structures as this may lead to the equipment or case being damaged or may be harmful to users.

⚠ WARNING

• Do not apply water, seawater or other oxidising reagents to Nickel Metal Hydride batteries, as this can cause rust and heat generation. If a battery becomes rusted, the gas release vent may no longer operate and can result in bursting.

• Do not connect more than 20 Nickel Metal Hydride batteries in series, as this may cause electrical shocks, leakage of battery fluid and heat generation.

• Keep Nickel Metal Hydride batteries or the equipment out of the reach of babies and small children, in order to avoid their swallowing batteries. In the event the batteries are swallowed, consult a doctor immediately.

• Do not charge or use Nickel Metal Hydride batteries with the + and – terminals reversed. Charging batteries with the terminals reversed may discharge rather than charge the batteries or it may cause abnormal chemical reaction in the batteries. Using batteries with the terminals reversed may result in abnormal current, leakage of battery fluid, heat generation, bursting and fire.

• Do not overcharge Nickel Metal Hydride batteries by exceeding the predetermined charging period specified by the battery charger's instructions or indicator. If Nickel Metal Hydride batteries are not fully charged after the battery charger's predetermined charging period has elapsed, stop the charging process. Prolonged charging may cause leakage of battery fluid, heat generation, bursting. Be sure to handle recharged batteries carefully as they may be hot.

• Do not remove the outer tube from a battery or damage it. Doing so will expose the battery to the risk of a short circuit and may cause leakage of battery fluid, heat generation, bursting and fire.

• If Nickel Metal Hydride batteries leak fluid, change colour, change shape or change in any other way, do not use them otherwise they may cause heat generation, bursting and fire.

• Nickel Metal Hydride batteries contain the strong, colourless alkaline solution (electrolyte). If the skin or clothing comes in contact with fluid from a Nickel Metal Hydride battery, thoroughly wash the area immediately with clean water from the tap or another source. Battery fluid can irritate the skin.

• When the operating time of a Nickel Metal Hydride battery becomes much shorter than its initial operating time even after recharged, it should be replaced by a new battery as its battery life has ended.

⚠ CAUTION

• Do not strike or drop Nickel Metal Hydride batteries. Sharp impacts or blows to Nickel Metal Hydride batteries may cause leakage of battery fluid, heat generation, bursting and fire.

• Store Nickel Metal Hydride batteries out of the reach of babies and small children. When charging or using a battery, do not let babies or small children remove the battery from the charger or the equipment being used.

• Children should not use Nickel Metal Hydride batteries unless they have been carefully instructed on the contents of this instruction manual and their parents or guardians have confirmed that the children understand and appreciate the proper usage and safety hazards presented by the batteries.

• Be sure to charge Nickel Metal Hydride batteries within a temperature range of 0°C to +40ºC. When used at temperatures outside this range (0ºC to +40ºC) the batteries may cause leakage of battery fluid or heat generation. It could also impair performance or shorten service life of the Nickel Metal Hydride batteries.

• Do not charge a Nickel Metal Hydride battery when it has been cooled to 0ºC or below. Doing so may cause leakage of battery fluid, impair performance or shorten the operating life of Nickel Metal Hydride batteries.

• Do not use or store Nickel Metal Hydride batteries at high temperature, such as in strong direct sunlight, in cars during hot weather or directly in front of a heater. This may cause leakage of battery fluid. It could also impair performance and shorten the operating life of Nickel Metal Hydride batteries.

• Do not use old and new batteries mixed together or batteries at different charge levels. Do not use the Nickel Metal Hydride battery mixed together with a dry cell or other battery of different capacity, type or brand name. This may cause leakage of battery fluid and heat generation.

• When more than two batteries are to be used together, charge them simultaneously prior to use. If they are not charged at the same time, it could cause leakage of battery fluid and heat generation.

• Do not connect Nickel Metal Hydride batteries in parallel as this may cause leakage of battery fluid, heat generation, bursting and fire.

• For the recommended charging method for Nickel Metal Hydride batteries, read the battery charger's instruction manual carefully.

• If Nickel Metal Hydride batteries do not perform or function well with certain equipment, refer to the instruction manual or warnings of the subject equipment.

• Do not charge Nickel Metal Hydride batteries beyond the recommended time described in the instruction manual for charger or equipment. Overcharging causes leakage of battery fluid, heat

generation, bursting and fire. It could also impair performance and shorten the service life of Nickel Metal Hydride batteries.

• After long term storage, there is a possibility that the battery could not be fully charged. In order to fully charge it, charge and discharge the battery a few times.

• Be sure to turn off the equipment after use of Nickel Metal Hydride batteries, or this may result in leakage of battery fluid.

• After they have been removed from equipment, store Nickel Metal Hydride batteries in a dry place and within the recommended storage temperature range. This will help preserve the batteries' performance and durability and to minimise the possibility of leakage of battery fluid or corrosion. (For the indicated storage temperature range, refer to the rating table of this catalogue. Moltech recommends a temperature range from -20ºC to 30ºC for longer service life).

• Before using Nickel Metal Hydride batteries, be sure to read the operation manual and all precautions carefully, then store the manual and precautions carefully to use as reference when the need arises. If you have specific questions about the operation manual or the precautions, contact Moltech at the locations listed on our website (www.moltechpower.co.uk).

• If corrosion, heat generation or other abnormalities with new Nickel Metal Hydride batteries are detected, stop using them immediately.

• If the Nickel Metal Hydride battery terminals become dirty, clean them with a soft, dry cloth prior to use. Dirt on the terminals can result in poor contact with the equipment, loss of power or inability to charge.

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