



Nickel Cadmium Batteries Handling Precautions

Carefully read this instruction manual before using Nickel Cadmium 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 Cadmium batteries. Please carefully evaluate the information in this section when using Nickel Cadmium batteries (single cell or packed cells) or when using or manufacturing equipment incorporating Nickel Cadmium batteries.

This manual is no substitute for your independent evaluation of equipment incorporating Nickel Cadmium batteries. Customers incorporating Nickel Cadmium batteries into their equipment must assure that their completed product has been properly designed, manufactured and tested. End users of equipment incorporating Nickel Cadmium 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 Cadmium 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 Cadmium batteries together with electrically conductive materials, including lead wires. Do not transport or store Nickel Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium 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 Cadmium batteries contain the strong colourless alkaline solution (electrolyte). The alkaline solution is extremely corrosive and will cause skin damage. If any fluid from Nickel Cadmium 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 Cadmium 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 Cadmium 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 Cadmium batteries in series, as this may cause electrical shocks, leakage of battery fluid and heat generation.
- Keep Nickel Cadmium 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 Cadmium 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 Cadmium batteries by exceeding the predetermined charging period specified by the battery charger's instructions or indicator. If Nickel Cadmium 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 Cadmium 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 Cadmium batteries contain the strong, colourless alkaline solution (electrolyte). If the skin or clothing comes in contact with fluid from a Nickel Cadmium 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 Cadmium 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 Cadmium batteries. Sharp impacts or blows to Nickel Cadmium batteries may cause leakage of battery fluid, heat generation, bursting and fire.
- Store Nickel Cadmium 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 Cadmium 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 Cadmium batteries within a temperature range of 0°C to +40°C. When used at temperatures outside this range (0°C to +40°C) the batteries may cause leakage of battery fluid or heat generation. It could also impair performance or shorten service life of the Nickel Cadmium batteries.
- Do not charge a Nickel Cadmium battery when it has been cooled to 0°C or below. Doing so may cause leakage of battery fluid, impair performance or shorten the operating life of Nickel Cadmium batteries.
- Do not use or store Nickel Cadmium 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 Cadmium batteries.
- Do not use old and new batteries mixed together or batteries at different charge levels. Do not use the Nickel Cadmium 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 Cadmium batteries in parallel as this may cause leakage of battery fluid, heat generation, bursting and fire.
- For the recommended charging method for Nickel Cadmium batteries, read the battery charger's instruction manual carefully.
- If Nickel Cadmium 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 Cadmium 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 Cadmium 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 Cadmium batteries, or this may result in leakage of battery fluid.
- After they have been removed from equipment, store Nickel Cadmium 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 -20°C to 30°C for longer service life).
- Before using Nickel Cadmium 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 Cadmium batteries are detected, stop using them immediately.
- If the Nickel Cadmium 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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