Precautions for designing devices with NI-MH batteries

In order to take full advantage of the properties of Ni-MH batteries and also to prevent problems due to improper use, please note the following points during the use and design of battery operated products.

Underlined sections indicate information that is especially important

1. Charging

1.1 Charging temperature

- Charge batteries within an ambient temperature range of 0℃ to 45 ℃.
- Ambient temperature during charging affects charging efficiency. As charging efficiency is best within temperature range of 10 ℃ to 30 ℃, whenever possible place the charger (battery pack) in a location within this temperature range.
- At temperatures below 0 ℃ the gas absorption reaction is not adequate, causing gas pressure inside the battery to rise, which can activate the safety vent and lead to leakage of alkaline gas and deterioration in battery performance.
- Charging efficiency drops at temperatures above 45 ℃. This can disrupt full charging and lead to deterioration in performance and battery leakage.

1.2 Parallel charging of batteries

- Sufficient care must be taken during the design of the charger when charging batteries connected in parallel.
  Consult Panasonic when parallel charging is required. .

1.3 Reverse charging

- Never attempt reverse charging.
  Charging with polarity reversed can cause a reversal in battery polarity causing gas pressure inside the battery to rise, which can activate the safety vent, lead to alkaline electrolyte leakage, rapid deterioration in battery performance, battery swelling or battery rupture.

1.4 Overcharging

- Avoid overcharging. Repeated overcharging can lead to deterioration in battery performance. (“Overcharging” means charging a battery when it is already fully charged.)

1.5 Rapid charging

- To charge batteries rapidly, use the specified charger (or charging method recommended by Panasonic) and follow the correct procedures.

1.6 Trickle charging (continuous charging)

- Trickle charging cannot be used with Ni-MH batteries. However, after applying a refresh charge using a rapid charge, use a trickle charge of 0.33 It to 0.05 It.
  Also, to avoid overcharging with trickle charge, which could damage the cell characteristics, a timer measuring the total charge time should be used.]
- Note: “It”
  During charging and discharging, “It” is a value indicating current and expressed as a multiple of nominal capacity . For example, for a 1500mAh battery of 0.033It , this value is equal to 1/30×1500, or roughly 50mA.

  It (A)= rated capacity(Ah)/1(h)