

# NiMH Batteries

## Standard & Intrinsically Safe – FAQs

### **Why do some NiMH batteries not charge to full capacity or have shorter run times than expected?**

While there are several reasons for this, the most common reason is that new NiMH batteries require four to eight formation charge cycles before showing rated capacity. Other reasons may be related to the charger used, the design of the battery, the age of the battery, and how the battery is discharged on test equipment.

### **Is it normal for a Power Products intrinsically safe battery not to charge to full capacity?**

Intrinsically safe NiMH batteries from Power Products are certified by SGS for use in hazardous areas. To provide the necessary safety, these batteries incorporate a material called nichrome in the safety circuit. Nichrome is an excellent material for achieving the desired safety parameters, but it tends to increase internal resistance and charging may cause the battery to increase in temperature leading to charge termination before the battery is fully charged.

Due to the temperature sensing circuitry in Endura chargers, charging may cease when the battery is only 80–90 percent charged. Charging a battery in a warm environment will increase the chances of early termination due to high temperature resulting in less than full capacity.

### **Does the type of charger used cause a NiMH battery to be undercharged?**

If a Power Products NiMH battery is not smart, it will typically undercharge in a Motorola IMPRES™ charger. Since non-smart batteries do not communicate with the charger, the charger defaults to a “safe” early termination, which in most cases is 80–90 percent of the battery’s capacity. Where available, slow or trickle chargers will provide a fuller charge for NiMH batteries.

### **How does battery age impact run time and performance?**

As the number of charge/discharge cycles increases, the battery’s capacity is reduced. A battery with good quality NiMH cells should provide about 80 percent of rated capacity, up to 500 cycles. After 500 cycles, the battery run time may decline significantly indicating the battery has reached its useful end of life.

In the case of Power Products’ NiMH intrinsically safe batteries, the aging of the cells combined with use of nichrome in the protection circuit can result in a greater internal impedance over time, which could cause the radio to power off during transmission when its state of charge is too low. Lowering the transmission power level on the radio may resolve this issue. Otherwise, the battery has reached the end of its useful life.

### **How should a NiMH battery be discharged on test equipment when measuring capacity?**

We recommend a C/4 discharge rate. Discharging at a faster rate could distort the results of a capacity test triggering a diminished capacity measurement.

**If you are experiencing persisting issues or problems outside those listed here, please contact Power Products Customer Care at 800-529-1618.**

**Toll Free** 800-529-1618  
**Local** 770-740-9400  
**Fax** 770-569-1844  
**Website** [www.powerproducts.com](http://www.powerproducts.com)

Serving the wireless industry since 1994.