

# Guidance on Storage and Handling of Batteries

## Introduction

Raytec products are designed to give you the most flexible, convenient and reliable Emergency lighting solutions on the market. However, we do still rely heavily on batteries as a key component in these products.

We work continuously to evaluate new battery technologies and to develop better products. For the moment, we believe we are using the best technologies that balance price and performance across the normal operating conditions of our products.

The bulk of our products are based on industry standard, high temperature NiCd (Nickel Cadmium) emergency cells. These batteries operate across a wide temperature range and meet the design life in excess of the 4 years we require for standard Emergency lighting applications.

We ship the batteries fully charged but disconnected to give the best life during shipping (so there is no external load from our driver electronics). However, the batteries do have some limitations with the battery technology available to us today.

The following points should be kept in mind when working with our battery packs and the products that use them.

## Storage

The batteries provided with all relevant Raytec products are fully charged and tested before shipping.

The external packaging and the battery pack are labeled with the last charged date before shipping.

To ensure the products work as expected, we recommend that the batteries are kept in a low humidity environment (RH < 65 %).

Temperature	Storage Period	Notes
5°C to 25°C	3 months <sup>1</sup>	Recommended
-40°C to 5°C	1 month <sup>2</sup>	Once only
25°C to 70°C	1 month <sup>3</sup>	Once only
< -40°C OR > 70°C	Not permitted	

## Warranty

Batteries are classified as a consumable item and are not covered by the standard Raytec 5-year warranty. Battery life will be between 4 and 7 years depending on environmental conditions, at which point they will have to be replaced to maintain the performance of the fixture.

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<sup>1</sup> If the batteries must be stored for a longer period than has been recommended, the batteries should be recharged periodically using an external battery charger.

<sup>2</sup> Where the batteries are stored at lower than recommended temperatures, this period cannot be extended by recharging.

<sup>3</sup> Where the batteries are stored at higher than recommended temperatures and humidity, this period cannot be extended by recharging.

# Installation and Commissioning

## Commissioning

After installation, the light fixture will go through a series of commissioning cycles, with new or replacement batteries, to ensure that the full rated capacity of the battery is achieved.

Once the batteries are installed and mains power is connected, the units will enter the commissioning cycle within 24 hours and carry out 3 full cycles of battery charging/discharging. The battery is charged for approximately 24 hours before each discharge cycle. To prevent multiple lights entering testing at the same time, a short random delay is added to the commissioning cycle. To ensure that all batteries are fully cycled during commissioning, we recommend that a full 5 days is allowed for this process to complete. Once complete the indication LED turns green.

During that period the permanent/unswitched mains supply **must not** be interrupted.

If the main supply is interrupted, the program will revert to the previous cycle. If luminaires are switched off every night, the commissioning phase will never be completed successfully.

## Avoiding Excess Discharge Cycles

The batteries are protected by the controller / power supply and will shut off before fully depleted. However, if left for long periods or frequently cycled, the life of the battery is likely to be compromised.

If power is not available for prolonged periods and the batteries are repeatedly depleted without the normal trickle charge provided by the controller / power supply, then there is a high risk that the batteries could be permanently damaged or have their useful life reduced.

## Avoiding Deep Discharge

If the light fixtures are disconnected from power for long periods (>2 weeks) they will continue to draw a low amount of power from the batteries. If such events happen, it is recommended to disconnect the batteries and only reconnect them once mains power is resumed.

Even when disconnected the storage life of the batteries (see 'Storage') should be considered.

Failure to do so could result in batteries being deeply discharged below the threshold in which the built-in charger can recover them.



### Safety

- Do not short-circuit the battery pack.
- Do not open, damage or try to disassemble the battery packs.
- Keep battery packs dry.
- Keep the battery packs away from excessive heat.

## Disposal

Batteries are not typically handled as normal waste. Refer to local regulations for the safe disposal of NiCd (Nickel Cadmium) batteries.

## Recommended Charging / Battery Recovery Process

### Equipment

We recommend charging our battery packs with Mascot 2115 (NiMH/NiCd) charger.

This can be purchased online from the Mascot website ([www.mascot.no](http://www.mascot.no)), or from other distributors such as RS Supplies or CPC Farnell.

The charger requires a separate mains cable available from the same suppliers.

As supplied, the charger is fitted with a barrel plug which can be removed and replaced with a suitable screw or spring terminal block for use with Raytec battery packs.

Note the positive wire on the charge cable is identified by a white printed line.

### Charger Use

1. With the charger OFF;
  - a. The red wire on the battery should be connected to the positive wire on the charger cable.
  - b. The black wire on the battery should be connected to the negative wire on the charger cable.
2. Check the wires are inserted into the correct socket and with the correct polarity.
3. Switch ON the charger.

Notice that the LED will flash RED and GREEN twice, and then off. After which a RED LED should be constantly ON, indicating the battery is being charged. If not, disconnect the battery immediately and check the connections.
4. When the batteries are fully charged, the LED will turn GREEN.

The average charging duration is 4-6 hours depending on the initial battery charge level.
5. After the batteries are charged, SWITCH-OFF the charger.
6. The battery voltage should be  $\geq 13,5V$  DC. This can be checked with a suitable Voltmeter or multimeter set to a suitable DC Volt range.
7. Indicate the charge date on the batteries.
8. When removing the batteries from the charger place a label or insulation over the positive wire to prevent accidental short circuit or discharge.

Do not leave the batteries on charge and unattended for longer than 24 hours.