

TYSONIC NI-CD BATTERY TY-SC2200mAh

This data involving nominal voltage and the approximate weight of stack-up batteries shall be equal to the value of the unit cell multiplied by the number of unit cell in the battery. For example, a stack up battery consists of five unit cell:

Nominal Voltage of unit cell=1.2V

Thus, nominal voltage of stack up battery=1.2*5=6.0V

1. RATING

| Description | Unit | Specification | Conditions |
|---------------------------------|------|---|---|
| Nominal Voltage | V | <u>1.2</u> | Unit Cell |
| Nominal Capacity | mAh | <u>2200</u> | Standard Charge/Discharge |
| Nominal Dimension (with sleeve) | mm | $\Phi=22.5 \pm 0.5$ $H=42.5 \pm 0.5$ | Unit Cell |
| Weight Approx. | g | <u>56</u> | Unit Cell |
| Standard Charge | mA | <u>220</u> (0.1C) | T=0~45°C |
| | hour | <u>15</u> | |
| Fast Charge | mA | <u>2200</u> (1C) | T=10~40°C Tmax=45°C - $\Delta V=5 \sim 10$ mV/cell Timer CutOff=120% |
| | hour | <u>1.2</u> | |
| Standard Discharge | mA | <u>440</u> (0.2C) | T= -20~60°C Cut-off Voltage=1.0V/Cell |
| Maximum Discharge Current | A | <u>22</u> (10C) | Cut-off Voltage=0.7V/cell |
| Storage Temperature | °C | <u>-20 ~35</u> | Discharge State |

2. PERFORMANCE

Unless otherwise stated, tests should be done within one month of delivery.

Under the following conditions:

Ambient Temperature, T: $20 \pm 5^\circ\text{C}$

Relative Humidity, : $65 \pm 20\%$

Note. 1: Standard Charge/Discharge Condition:

Charge: 220 mA (0.1C) ×15hrs

Discharge: 440 mA (0.2C) to 1.0V/cell

| Test | Unit | Specification | Conditions | Remarks |
|----------------------|------------------|---|--|----------------------------|
| Capacity | mAh | ≥ 2200 | Standard Charge/Discharge | Up to 5 cycles are allowed |
| Open circuit voltage | V/Cell | ≥ 1.25 | Within 1 hour after standard charge | |
| Internal Impedance | m Ω /Cell | ≤ 8 | Upon fully charge (1KHZ) | Unit cell |
| Discharge at 1CmA | Minute | ≥ 54 | Standard Charge, 1 hour rest before discharge | |
| Overcharge | N/A | Leakage& deformation may occur, but no explosion is allowed | <u>220</u> mA (0.1C) charge 28 days | T=20±5°C |
| Reverse charge | N/A | Leakage& deformation may occur, but no explosion is allowed | 0.2CmA discharge to 0V, then reverse charge with 1CmA for 1 hour | |
| Charge Retention | mAh | ≥ 1430 (65%) | Standard charge, Storage: 28 days, Standard Discharge | |
| IEC Cycle Life | Cycle | See note. 2 | IEC60285 (1999) 4.4.1 | |
| Short circuit | N/A | Leakage& deformation may occur, but no explosion is allowed | After standard charge, short circuit for 1 hour. (load $\leq 100\text{m}\Omega$ for 24hrs) | |

| Test | Unit | Specification | Conditions | Remarks |
|-----------------|------|-------------------------------------|---|---------|
| Mechanical test | hour | (duration of discharge) ≥ 5 | Charge the battery 0.1CmA 15hrs, carry out bump test under the following condition: Peak acceleration(A): $98n/s^2$ (10G) Corresponding duration of pulse(D) 16ms Corresponding velocity change 1.00m/s Number of bumps 1000 ± 10 Then stand for 1~4hrs, Discharge at 0.2CmA | |

3. EXTERNAL APPEARANCE

The cell/battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

4. CAUTION

1. Reverse charge is not acceptable.
2. Charge before use. The cells/batteries are delivered in an uncharged state.
3. Do not charge/discharge with more than specified current.
4. Do not short circuit the cell/battery.
5. Do not incinerate or mutilate the cell/battery.
6. Do not solder directly to the cell/battery.
7. The life expectancy may be reduced if the cell/battery is subjected to adverse conditions like: extreme temperature, deep cycling, excessive overcharge/over-discharge.
8. Store the cell/battery uncharged in cool dry place. Always discharge batteries before bulk storage or shipment.

Note.2 :

Ambient temperature: $20 \pm 5^\circ\text{C}$

Before the endurance in cycles test, the cell shall be discharged at 0.2CmA to a final voltage of 1.0V.

The following endurance test shall be carried out at constant current throughout, using the conditions specified in **table1**.
Precautions shall be taken to prevent the cell-case temperature from rising above 35°C during the test, by providing a forced air draught if necessary.

Table 1-endurance in cycles

| Cycle number | Charge | Stand in charged condition | Discharge |
|---|---------------------|----------------------------|---------------------|
| 1 | 0.1CmA for 16h | None | 0.25CmA for 2h20min |
| 2 to 48 | 0.25CmA for 3h10min | None | 0.25CmA for 2h20min |
| 49 | 0.25CmA for 3h10min | None | 0.25CmA to 1.0V |
| 50 | 0.1CmA for 16h | 1h to 4h | 0.2CmA to 1.0V |
| *it is permissible to allow sufficient open-circuit rest time after the completion of discharge at cycle 50, so as to start cycle 51 at an exact two-week interval. A similar procedure may be adopted at cycles 100, 150, 200, 250, 300 and 350. | | | |

Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3h. At this stage, a further cycle as specified for cycle 50 shall be carried out.

The endurance test is considered complete when two such successive cycles give discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 400.