Date:December 14,2010

# Sanyo Test Report

| | |
|---|---|
| Name of Sample | Lithium Ion Battery 3UR18650-2-T0407 |
| Consignor | SANYO Energy(Suzhou) CO.,LTD |
| Manufacturer | SANYO Energy(Suzhou) CO.,LTD |
| Test Method | United Nations "Recomenndations on the TRANSPORT OF DANGEROUS GOODS" |
| Criterion | United Nations "Recomenndations on the TRANSPORT OF DANGEROUS GOODS" |
| Appearance | Black rectangular parallelepiped |
| Test Date | 2008/09/04 – 2008/09/26 |
| Sample Number | 24 |
| Test Items | Altitude simulation, Thermal test, Vibration test, Shock test, External short circuit, Overcharged |
| Conclusion | The sample has passed the items of UN38.3. |
| Remark | Certification by Similar Model: 3UR18650-2-T0044<br>Ratio of (3UR18650-2-T0407)/(3UR18650-2-T0044)<br>[+]=100%, [-]=100%, [Electrolyte]=100% |
| Consignor Address | No.86 Sunwu Road, Xukou, Wuzhong District, Suzhou City, Jiangsu Province 215164, China |

Sanyo Energy(Suzou) Co.,Ltd.

| Approval | Check | Writing |
|---|---|---|

CONFIDENTIAL

Date:December 14,2010

# A：Checklist for Judging New Type Cell or not

Confirmation of presence of change in "The element which is given influence"
（Change ⇒ ○、 No change ⇒ ―）
When there is no change in all items, it is NOT considered to be a New Type Cell.

| | |
|---|---|
| Model which UN regulation test has completed | UR18650FK |
| Target model which is not a new type | UR18650FJ |

| Check Item | The element which is given influence | Presence of change |
|---|---|---|
| Cell dimensions | Are the dimensions of this cell the same as those of the test completion cell? | ― |
| Safety parts and mechanical components | Are the safety parts and mechanical components of this cell the same as those of the test completion cell? | ― |
| Cathode material system | Is cathode material system of this cell the same as that of the test completion cell? | ― |
| Anode material system | Is anode material system of this cell the same as that of the test completion cell? | ― |
| Electrolyte material system | Is electrolyte material system of this cell the same as that of the test completion cell? | ― |
| Mass of cathode material | Is mass difference of the design center of each cell concerning cathode less than 0.1 g or 20% ? | ― |
| Mass of anode material | Is mass difference of the design center of each cell concerning anode less than 0.1 g or 20% ? | ― |
| Mass of electrolyte | Is mass difference of the design center of each cell concerning electrolyte less than 0.1 g or 20% ? | ― |
| Judgment result | New Type or not | ~~New~~・Not new |

Sanyo Energy(Suzou) Co.,Ltd.

K. Morina　　A. Tsutsui　　XIAO

approval　　Check　　Writing

Date:December 14,2010

## B：Checklist for Judging New Type Battery or not

Confirmation of presence of change in "The element which is given influence"
（Change ⇒ ○、 No change ⇒ ー）
When there is no change in all items, it is NOT considered to be a New Type Battery.

| | |
|---|---|
| Model which UN regulation test has completed | 3UR18650-2-T0044 |
| Target model which is not a new type | 3UR18650-2-T0407 |

| Test Item (Function) | The element which is given influence | Presence of change |
|---|---|---|
| T1：Altitude Simulation (Decompression load) | ・Crimped part, Gasket (Cell)<br>・Gas Release Vent, Cell Case (Cell)<br>・Pack (Plastic) Case<br>・Holding Member(Insulator, Insulation Tape, Both Sides Tape)<br>・Coating materials | ー |
| T2：Thermal Shock (Repetition of high temp. and low temp.) | ・Crimped part, Gasket (Cell)<br>・Gas Release Vent, Cell Case (Cell)<br>・Finished state of Wound Electrodes (Cell)<br>・Pack (Plastic) Case<br>・Holding Member(Insulator, Insulation Tape, Both Sides Tape)<br>・Coating materials | ー |
| T3：Vibration (Vibration load) | ・Finished state of Wound Electrodes (Cell)<br>・Electric wiring member<br>・Electronic Parts on a circuit board<br>・Cell Holding Member (Adhesive, Both Sides Tape, Lib of Plastic Case ) | ー |
| T4：Shock(Shock load) | ・Wiring Member<br>・Electronic Parts on a circuit board<br>・Cell Holding Member(Adhesive, Both Sides Tape, Lib of Plastic Case )<br>・Finished state of Wound Electrodes (Cell) | ー |
| T5：External Short Circuit(Short current) | ・Over-voltage Protection<br>・Current Control Device<br>・Safety Device of cell (Cell)<br>・Lead Tab | ー |
| T6(Cell)：Impact(Crash load) | ・Separator (Cell)<br>・Insulation State in a cell (Cell) | ー |
| T7(Pack)：Overcharge(Charge load) | ・Overcharge Protection<br>・Thermal Device<br>・Safety Device of cell (Cell) | ー |
| Judgment result | New Type or not | New・(Not new) |

Sanyo Energy(Suzou) Co.,Ltd.

K. Morina　　A. Tsutsui　　XIAO

approval　　Check　　Writing

E1005756 Dec. 14. 2010

# Certificate of UN test for Lithium ion battery

Customer Model : LO8S6Y02
Sanyo Model : 3UR18650-2-T0407
Sanyo Product Code : F12430766

Sanyo Energy(Suzhou)Co., Ltd.
Morina Kenichi Senior Manager

| Manual of Tests and Criteria (38.3 Lithium batteries) | | Test results | Note | Number of test batteries | | | |
|---|---|---|---|---|---|---|---|
| No. | Test item | | | | | | |
| T 1 | Altitude simulation | Pass | | First cycle fully charged 4 batteries | First cycle fully Discharged 4 batteries | After 50 cycles fully charged 4 batteries | After 50 cycles fully discharged 4 batteries |
| T 2 | Thermal test | Pass | | | | | |
| T 3 | Vibration | Pass | | | | | |
| T 4 | Shock | Pass | | | | | |
| T 5 | External short circuit | Pass | | | | | |
| T 6 | Impact | Pass | | First cycle 50% charged 5 cells for cylindrical cell, 10 cells for prismatic cell, 5 cells for coin cell. | | After 50 cycles, fully discharged 5 cells for cylindrical cell, 10 cells for prismatic cell, 5 cells for coin cell. | |
| T 7 | Overcharge | Pass | For battery only | First cycle fully charged 4 batteries | | After 50 cycles, fully charged 4 batteries | |
| T 8 | Forced discharge | — | For cell only | For cell only | | | |

## Lithium ion battery Specification

| Item | Nominal value | Note |
|---|---|---|
| Watt-hour rating | 48 Wh | |
| Nominal voltage | 11.1 V | |
| Lithium equivalent content | 3.96 g | |

We declare the above : The test result mentioned above was checked according to UN test.
(Manual of Tests and Criteria ST/SG/AC.10/11/Rev.4, PartIII, sub-section 38.3)

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** Altitude simulation (T1)

**2.Test Purpose:** This test simulates air transport under low-pressure conditions.

**3.Test Procedure:**

Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature(20±5℃).

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

No mass loss(less than 0.1%),no leakage,no venting,no disassembly,no rupture and no fire,and the voltage retention is not less than 90%.

The requirement relating to voltage is not applicable to test batteries at fully discharged states.

**5.Test Date:** 2008/9/4

**6.Test Data**

| Battery No. | | Mass(g) | | Mass loss (%) (=<0.1%) | Voltage(V) | | Voltage Retention(%)(=>90%) | Other event | Result | Judgement |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before test | After test | | Before test | After test | | | | |
| At first cycle,in fully charged states | 1 | 313.24 | 313.23 | 0.003 | 12.58 | 12.58 | 100.0 | 0 | PASS | PASS |
| | 2 | 314.62 | 314.61 | 0.003 | 12.59 | 12.59 | 100.0 | 0 | PASS | |
| | 3 | 315.44 | 315.43 | 0.003 | 12.58 | 12.58 | 100.0 | 0 | PASS | |
| | 4 | 313.85 | 313.84 | 0.003 | 12.59 | 12.59 | 100.0 | 0 | PASS | |
| At first cycle,in fully discharged states | 5 | 315.33 | 315.32 | 0.003 | | | | 0 | PASS | |
| | 6 | 315.64 | 315.63 | 0.003 | | | | 0 | PASS | |
| | 7 | 314.05 | 314.05 | 0.000 | | | | 0 | PASS | |
| | 8 | 313.25 | 313.24 | 0.003 | | | | 0 | PASS | |
| After 50 cycles ending in fully charged states | 9 | 315.50 | 315.50 | 0.000 | 12.59 | 12.58 | 99.9 | 0 | PASS | |
| | 10 | 315.83 | 315.82 | 0.003 | 12.59 | 12.58 | 99.9 | 0 | PASS | |
| | 11 | 313.40 | 313.40 | 0.000 | 12.58 | 12.57 | 99.9 | 0 | PASS | |
| | 12 | 313.66 | 313.65 | 0.003 | 12.59 | 12.58 | 99.9 | 0 | PASS | |
| After 50 cycles ending in fully discharged states | 13 | 313.48 | 313.47 | 0.003 | | | | 0 | PASS | |
| | 14 | 313.71 | 313.69 | 0.006 | | | | 0 | PASS | |
| | 15 | 313.85 | 313.83 | 0.006 | | | | 0 | PASS | |
| | 16 | 313.87 | 313.86 | 0.003 | | | | 0 | PASS | |

Notes: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire,
0-No leakage, no venting, no disassembly, no rupture & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** Thermal Test (T2)

**2.Test Purpose:** This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.

**3.Test Procedure:**

Test cells and batteries are to be stored for at least six hours at a test temperature equal to 75±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃.The maximum time internal between test temperature extremes is 30 minutes.This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20 ±5℃). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

No mass loss(less than 0.1%),no leakage,no venting,no disassembly,no rupture and no fire,and the voltage retention is not less than 90%.

The requirement relating to voltage is not applicable to test batteries at fully discharged states.

**5.Test Date:** 2008/9/5-2008/9/12

**6.Test Data**

| Battery No. | | Mass(g) | | Mass loss (%) (=<0.1%) | Voltage(V) | | Voltage Retention(%)(=>90%) | Other event | Result | Judgement |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before test | After test | | Before test | After test | | | | |
| At first cycle,in fully charged states | 1 | 313.23 | 313.20 | 0.010 | 12.58 | 12.43 | 98.8 | 0 | PASS | PASS |
| | 2 | 314.61 | 314.57 | 0.013 | 12.59 | 12.44 | 98.8 | 0 | PASS | |
| | 3 | 315.43 | 315.40 | 0.010 | 12.58 | 12.43 | 98.8 | 0 | PASS | |
| | 4 | 313.84 | 313.80 | 0.013 | 12.59 | 12.45 | 98.9 | 0 | PASS | |
| At first cycle,in fully discharged states | 5 | 315.32 | 315.29 | 0.010 | | | | 0 | PASS | |
| | 6 | 315.63 | 315.60 | 0.010 | | | | 0 | PASS | |
| | 7 | 314.05 | 314.02 | 0.010 | | | | 0 | PASS | |
| | 8 | 313.24 | 313.21 | 0.010 | | | | 0 | PASS | |
| After 50 cycles ending in fully charged states | 9 | 315.50 | 315.47 | 0.010 | 12.58 | 12.44 | 98.9 | 0 | PASS | |
| | 10 | 315.82 | 315.79 | 0.009 | 12.58 | 12.43 | 98.8 | 0 | PASS | |
| | 11 | 313.40 | 313.37 | 0.010 | 12.57 | 12.43 | 98.9 | 0 | PASS | |
| | 12 | 313.65 | 313.62 | 0.010 | 12.58 | 12.44 | 98.9 | 0 | PASS | |
| After 50 cycles ending in fully discharged states | 13 | 313.47 | 313.45 | 0.006 | | | | 0 | PASS | |
| | 14 | 313.69 | 313.67 | 0.006 | | | | 0 | PASS | |
| | 15 | 313.83 | 313.80 | 0.010 | | | | 0 | PASS | |
| | 16 | 313.86 | 313.85 | 0.003 | | | | 0 | PASS | |

Notes: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire,
0-No leakage, no venting, no disassembly, no rupture & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** Vibration (T3)

**2.Test Purpose:** This test simulates vibration during transport.

**3.Test Procedure:**

Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes.This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm(1.6 mm total excursion) and thefrequency increased until a peak acceleration of 8gn occurs (approximately 50Hz).A peak acceleration of 8 gn is then maintained until the frequency is increased to 200Hz.

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

No mass loss(less than 0.1%),no leakage,no venting,no disassembly,no rupture and no fire,and the voltage retention is not less than 90%.

The requirement relating to voltage is not applicable to test batteries at fully discharged states.

**5.Test Date:** 2008/9/18-2008/9/19

**6.Test Data**

| Battery No. | | Mass(g) | | Mass loss (%) (=<0.1%) | Voltage(V) | | Voltage Retention(%)(=>90%) | Other event | Result | Judgement |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before test | After test | | Before test | After test | | | | |
| At first cycle,in fully charged states | 1 | 313.20 | 313.21 | 0.003 | 12.43 | 12.40 | 99.8 | 0 | PASS | PASS |
| | 2 | 314.57 | 314.56 | 0.003 | 12.44 | 12.40 | 99.7 | 0 | PASS | |
| | 3 | 315.40 | 315.40 | 0.000 | 12.43 | 12.41 | 99.8 | 0 | PASS | |
| | 4 | 313.80 | 313.80 | 0.000 | 12.45 | 12.42 | 99.8 | 0 | PASS | |
| At first cycle,in fully discharged states | 5 | 315.29 | 315.29 | 0.000 | | | | 0 | PASS | |
| | 6 | 315.60 | 315.61 | 0.003 | | | | 0 | PASS | |
| | 7 | 314.02 | 314.01 | 0.003 | | | | 0 | PASS | |
| | 8 | 313.21 | 313.21 | 0.000 | | | | 0 | PASS | |
| After 50 cycles ending in fully charged states | 9 | 315.47 | 315.45 | 0.006 | 12.44 | 12.41 | 99.8 | 0 | PASS | |
| | 10 | 315.79 | 315.78 | 0.003 | 12.43 | 12.41 | 99.8 | 0 | PASS | |
| | 11 | 313.37 | 313.36 | 0.003 | 12.43 | 12.40 | 99.8 | 0 | PASS | |
| | 12 | 313.62 | 313.60 | 0.006 | 12.44 | 12.42 | 99.8 | 0 | PASS | |
| After 50 cycles ending in fully discharged states | 13 | 313.45 | 313.43 | 0.006 | | | | 0 | PASS | |
| | 14 | 313.67 | 313.66 | 0.003 | | | | 0 | PASS | |
| | 15 | 313.80 | 313.80 | 0.000 | | | | 0 | PASS | |
| | 16 | 313.85 | 313.86 | 0.003 | | | | 0 | PASS | |

Notes: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire,
0-No leakage, no venting, no disassembly, no rupture & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** Shock (T4)

**2.Test Purpose:** This test simulates possible impacts during transport.

**3.Test Procedure:**

Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell or battery shall be subjected to a half-sine shock of pack acceleration of 150 $g_n$ and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.

However, large cells and large batteries shall be subjected to a half-sine shock of peak acceleration of 50 $g_n$ and pulse duration of 11 milliseconds. Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

No mass loss(less than 0.1%),no leakage,no venting,no disassembly,no rupture and no fire,and the voltage retention is not less than 90%.

The requirement relating to voltage is not applicable to test batteries at fully discharged states.

**5.Test Date:** 2008/9/23

**6.Test Data**

| Battery No. | | Mass(g) | | Mass loss (%) (=<0.1%) | Voltage(V) | | Voltage Retention(%)(=>90%) | Other event | Result | Judgement |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before test | After test | | Before test | After test | | | | |
| At first cycle,in fully charged states | 1 | 313.21 | 313.19 | 0.006 | 12.40 | 12.38 | 99.8 | 0 | PASS | PASS |
| | 2 | 314.56 | 314.54 | 0.006 | 12.40 | 12.39 | 99.9 | 0 | PASS | |
| | 3 | 315.40 | 315.38 | 0.006 | 12.41 | 12.39 | 99.8 | 0 | PASS | |
| | 4 | 313.80 | 313.79 | 0.003 | 12.42 | 12.40 | 99.8 | 0 | PASS | |
| At first cycle,in fully discharged states | 5 | 315.29 | 315.27 | 0.006 | | | | 0 | PASS | |
| | 6 | 315.61 | 315.60 | 0.003 | | | | 0 | PASS | |
| | 7 | 314.01 | 314.00 | 0.003 | | | | 0 | PASS | |
| | 8 | 313.21 | 313.20 | 0.003 | | | | 0 | PASS | |
| After 50 cycles ending in fully charged states | 9 | 315.45 | 315.44 | 0.003 | 12.41 | 12.39 | 99.8 | 0 | PASS | |
| | 10 | 315.78 | 315.76 | 0.006 | 12.41 | 12.38 | 99.8 | 0 | PASS | |
| | 11 | 313.36 | 313.35 | 0.003 | 12.40 | 12.38 | 99.8 | 0 | PASS | |
| | 12 | 313.60 | 313.60 | 0.000 | 12.42 | 12.39 | 99.8 | 0 | PASS | |
| After 50 cycles ending in fully discharged states | 13 | 313.43 | 313.41 | 0.006 | | | | 0 | PASS | |
| | 14 | 313.66 | 313.65 | 0.003 | | | | 0 | PASS | |
| | 15 | 313.80 | 313.78 | 0.006 | | | | 0 | PASS | |
| | 16 | 313.86 | 313.84 | 0.006 | | | | 0 | PASS | |

Notes: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire,
0-No leakage, no venting, no disassembly, no rupture & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** External short circuit (T5)

**2.Test Purpose:** This test simulates an external short circuit.

**3.Test Procedure:**

The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55±2℃ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1ohm at 55±2℃.This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55±2℃. The cell or battery must be observed for a further six hours for the test to be concluded.

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

External temperature of test batteries does not exceed 170℃ and there is no disassembly,no rupture and no fire within six hours of this test.

**5.Test Date:** 2008/9/26

**6.Test Data**

| Battery No. | | Maximum temperature (°C) | Other event | Result | Judgement |
|---|---|---|---|---|---|
| At first cycle,in fully charged states | 1 | 54.9 | 0 | PASS | PASS |
| | 2 | 54.8 | 0 | PASS | |
| | 3 | 54.5 | 0 | PASS | |
| | 4 | 54.6 | 0 | PASS | |
| At first cycle,in fully discharged states | 5 | 55.0 | 0 | PASS | |
| | 6 | 54.8 | 0 | PASS | |
| | 7 | 54.5 | 0 | PASS | |
| | 8 | 54.7 | 0 | PASS | |
| After 50 cycles ending in fully charged states | 9 | 54.8 | 0 | PASS | |
| | 10 | 54.6 | 0 | PASS | |
| | 11 | 54.7 | 0 | PASS | |
| | 12 | 54.3 | 0 | PASS | |
| After 50 cycles ending in fully discharged states | 13 | 54.7 | 0 | PASS | |
| | 14 | 54.7 | 0 | PASS | |
| | 15 | 54.6 | 0 | PASS | |
| | 16 | 54.5 | 0 | PASS | |

Notes: D-Disassembly, R-Rupture, F-Fire, 0-No disassembly, no rupture & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:** Impact (T6)

**2.Test Purpose:** This test simulates an impact.

**3.Test Procedure:**

The test sample cell or component cell is to be placed on a flat surface. A 15.8mm diameter bar is to be placed across the center of the sample. A 9.1kg mass is to be dropped from a height of 61±2.5cm onto the sample.

A cylindrical or prismatic cell is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm diameter curved surface lying across the centre of the test sample. A prismatic cell is also to be rotated 90 degrees around its longitudinal axis so that both the wide and narrow sides will be subjected to the impact. Each sample is to be subjected to only a single impact. Separate samples are to be used for each impact.

A coin or button cell is to be impacted with the flat surface of the sample parallel to the flat surface and the 15.8mm diameter curved surface lying across its center.

**SANYO Internal Procedure:**

As above.

**4.Test Requirements:**

External temperature of test batteries does not exceed 170°C and there is no disassembly and no fire within six hours of this test.

**5.Test Date:** 2009/1/29

**6.Test Data**:

| Cell No. | | Maximum Temperature(°C) | Other event | Result | Judgement |
|---|---|---|---|---|---|
| At first cycle, 50% charged states | 1 | 130 | 0 | PASS | PASS |
| | 2 | 121 | 0 | PASS | |
| | 3 | 126 | 0 | PASS | |
| | 4 | 122 | 0 | PASS | |
| | 5 | 124 | 0 | PASS | |
| | 6 | | 0 | PASS | |
| | 7 | | 0 | PASS | |
| | 8 | | 0 | PASS | |
| | 9 | | 0 | PASS | |
| | 10 | | 0 | PASS | |
| After 50 cycles ending, in fully discharged states | 11 | 72 | 0 | PASS | |
| | 12 | 68 | 0 | PASS | |
| | 13 | 69 | 0 | PASS | |
| | 14 | 66 | 0 | PASS | |
| | 15 | 68 | 0 | PASS | |
| | 16 | | 0 | PASS | |
| | 17 | | 0 | PASS | |
| | 18 | | 0 | PASS | |
| | 19 | | 0 | PASS | |
| | 20 | | 0 | PASS | |

Notes: D-Disassembly, F-Fire, 0-No disassembly & no fire

# UN Test Data (Model:3UR18650-2-T0407)



**1.Test Item:**Overcharged (T7)

**2.Test Purpose:** This test evaluates the ability of a rechargeable battery to withstand an overcharge condition.

**3.Test Procedure:**

The charge current shall be twice the manufacturer's recommended maximum continuous charge current.
The minimum voltage of the test shall be as follows:

(a) when the manufacturer's recommended charge voltage is not more than 18V,the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V.

(b) when the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

**SANYO Internal Procedure:**

| | |
|---|---|
| Min.Charge Voltage: | 22V |
| Charge Current: | 6.6A |

**4.Test Requirements:**

There is no disassembly and no fire within seven days of the test.

**5.Test Date:** 2008/9/10-2008/9/19

**6.Test Data**

| Battery No. | | Event | Result | Judgement |
|---|---|---|---|---|
| At first cycle in fully charged states | 1 | 0 | PASS | PASS |
| | 2 | 0 | PASS | |
| | 3 | 0 | PASS | |
| | 4 | 0 | PASS | |
| After 50 cycles ending in fully charged states | 5 | 0 | PASS | |
| | 6 | 0 | PASS | |
| | 7 | 0 | PASS | |
| | 8 | 0 | PASS | |

Notes: D-Disassembly, F-Fire, 0-No disassembly & no fire