TEST REPORT

Applicant: Vanson Electronics Ltd.
188 Ind. Zone,
Ping Shan Chuen,
Tangxia, Dongguan,
China.

Number: HK10040541-1
Date: 11 June, 2010

Sample Description

Product	:	Rechargeable Battery
Brand Name	:	Vanson
Model No.	:	Ni-MH (AAA Type)
No. of Samples	:	Sixty Six (66)

Date Received	:	13 April, 2010
Date Test Conducted	:	13 April, 2010 to 11 June, 2010

Test Requested : IEC 62133 : 2002

1. Clause 4.3.1 - Incorrect Installation of a cell
2. Clause 4.3.2 - External short circuit
3. Clause 4.3.3 - Free fall
4. Clause 4.3.4 - Mechanical shock (crash hazard)
5. Clause 4.3.5 - Thermal abuse
6. Clause 4.3.6 - Crushing of cells
7. Clause 4.3.7 - Low pressure
8. Clause 4.3.8 - Overcharge for nickel systems
9. Clause 4.3.10 - Forced discharge

IEC 61951-2 : 2003

10. Clause 5 & 6 - Cell designation, marking and dimensions

Test Method	:	IEC 62133 : 2002 & IEC 61951-2 : 2003
Test Results	:	See the attached sheets
Conclusion	:	See the attached sheets
Remark	:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

********** End of Page **********

Prepared and checked by

Digitally signed by Kong Ka Hang
Location: Intertek Testing Service HK

Kong Ka Hang, Felix
Supervisor

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TEST REPORT

Number : HK10040541-1

1. IEC 62133:2002 Clause 4.3.1 - Incorrect installation of a cell (nickel systems only)

Test Method:

Fully charged cells are evaluated under conditions in which one of the cells is incorrectly installed. Four fully charged single cells of the same brand, type, size and age are connected in series with one of the four cells reversed. The resultant assembly is connected across a resistor of 1 Ω until the vent opens or until the temperature of the reversed cell returns to ambient temperature. Alternatively, a stabilized d.c. power supply can be used to simulate the conditions imposed on the reversed cell.

Acceptance criteria:

No fire and no explosion.

Test Result:

Test Sample	Observations
Sample number 1-4	No explosion and no fire occurred
Sample number 5-8	No explosion and no fire occurred
Sample number 9-12	No explosion and no fire occurred
Sample number 13-16	No explosion and no fire occurred
Sample number 17-20	No explosion and no fire occurred

All samples were complied with this clause.

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2. IEC 62133:2002 Clause 4.3.2 - External short circuit

Test Method:

Two sets of fully charged cells or batteries are stored in an ambient temperature of 20 °C ± 5 °C and 55 °C ± 5 °C respectively. Each cell or battery is then short-circuited by connecting the positive and negative terminals with a total external resistance of less than 100 mΩ. The cells or batteries remain on test for 24 h or until the case temperature declines by 20 % of the maximum temperature rise, whichever is the sooner.

Acceptance criteria:

No fire and no explosion.

Test Result:

Condition: 20 ± 5°C

Test Sample	Test Temperature	Observations
Sample number 21	20°C	No explosion and no fire occurred
Sample number 22	20°C	No explosion and no fire occurred
Sample number 23	20°C	No explosion and no fire occurred
Sample number 24	20°C	No explosion and no fire occurred
Sample number 25	20°C	No explosion and no fire occurred

Condition: 55 ± 5°C

Test Sample	Test Temperature	Observations
Sample number 26	55°C	No explosion and no fire occurred
Sample number 27	55°C	No explosion and no fire occurred
Sample number 28	55°C	No explosion and no fire occurred
Sample number 29	55°C	No explosion and no fire occurred
Sample number 30	55°C	No explosion and no fire occurred

All samples were complied with this clause.

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3. IEC 62133:2002 Clause 4.3.3 - Free fall

Test Method:

Each fully charged cell or battery is dropped three times from a height of 1.0 m onto a concrete floor. The cells or batteries are dropped so as to obtain impacts in random orientations.

Acceptance criteria:

No fire and no explosion.

Test Result:

Test Sample	Observations
Sample number 31	No explosion and no fire occurred
Sample number 32	No explosion and no fire occurred
Sample number 33	No explosion and no fire occurred

All samples were complied with this clause.

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4. IEC 62133:2002 Clause 4.3.4 - Mechanical shock (crash hazard)

Test Method:

The fully charged cell or battery is secured to the testing machine by means of a rigid mount which will support all mounting surfaces of the cell or battery. The cell or battery is subjected to a total of three shocks of equal magnitude. The shocks are applied in each of three mutually perpendicular directions. At least one of them shall be perpendicular to a flat face.

For each shock the cell or battery is accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is 75 gn. The peak acceleration shall be between 125 gn and 175 gn. Cells or batteries are tested in an ambient temperature of 20 °C ± 5 °C.

Acceptance criteria:

No fire, no explosion and no leakage.

Test Result:

Test Sample	Observations
Sample number 34	No explosion and no fire occurred
Sample number 35	No explosion and no fire occurred
Sample number 36	No explosion and no fire occurred
Sample number 37	No explosion and no fire occurred
Sample number 38	No explosion and no fire occurred

All samples were complied with this clause.

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5. IEC 62133:2002 Clause 4.3.5 - Thermal abuse

Test Method:

Each fully charged cell, stabilized at room temperature, is placed in a gravity or circulating air-convection oven. The oven temperature is raised at a rate of 5°C/min ± 2°C/min to a temperature of 130°C ± 2°C. The cell remains at this temperature for 10 min before the test is discontinued.

Acceptance criteria:

No fire and no explosion.

Test Result:

Test Sample	Observations
Sample number 39	No explosion and no fire occurred
Sample number 40	No explosion and no fire occurred
Sample number 41	No explosion and no fire occurred
Sample number 42	No explosion and no fire occurred
Sample number 43	No explosion and no fire occurred

All samples were complied with this clause.

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6. IEC 62133:2002 Clause 4.3.6 - Crushing of cells

Test Method:

Each fully charged cell is crushed between two flat surfaces. The force for the crushing is applied by a hydraulic ram exerting a force of 13 kN ± 1 kN. The crushing is performed in a manner that will cause the most adverse result. Once the maximum force has been applied, or an abrupt voltage drop of one-third of the original voltage has been obtained, the force is released.

A cylindrical or prismatic cell is crushed with its longitudinal axis parallel to the flat surfaces of the crushing apparatus. To test both wide and narrow sides of prismatic cells, a second set of cells is tested, rotated 90° around their longitudinal axes compared to the first set.

Acceptance criteria:

No fire and no explosion.

Test Result:

Test Sample	Observations
Sample number 44	No explosion and no fire occurred
Sample number 45	No explosion and no fire occurred
Sample number 46	No explosion and no fire occurred
Sample number 47	No explosion and no fire occurred
Sample number 48	No explosion and no fire occurred

All samples were complied with this clause.

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7. IEC 62133:2002 Clause 4.3.7 - Low pressure

Test Method:

Each fully charged cell is placed in a vacuum chamber, in an ambient temperature of 20 °C ± 5 °C. Once the chamber has been sealed, its internal pressure is gradually reduced to a pressure equal to or less than 11.6 kPa (this simulates an altitude of 15 240 m) held at that value for 6 h.

Acceptance criteria:

No fire, no explosion and no leakage.

Test Result:

Test Sample	Observations
Sample number 49	No explosion and no fire occurred
Sample number 50	No explosion and no fire occurred
Sample number 51	No explosion and no fire occurred

All samples were complied with this clause.

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8. IEC 62133:2002 Clause 4.3.8 - Overcharge for nickel systems

Test Method:

A discharged cell or battery is subjected to a high-rate charge of 2.5 times the recommended charging current for a time that produces a 250 % charge input (250 % of rated capacity).

Acceptance criteria:

No fire and no explosion.

Test Result:

Tested Sample	Observations
Tested sample 52	No explosion and no fire occurred
Tested sample 53	No explosion and no fire occurred
Tested sample 54	No explosion and no fire occurred
Tested sample 55	No explosion and no fire occurred
Tested sample 56	No explosion and no fire occurred

All samples were complied with this clause.

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9. IEC 62133:2002 Clause 4.3.10 - Forced discharge

Test Method:

A discharged cell is subjected to a reverse charge at 1 I_t for 90min.

Acceptance criteria:

No fire and no explosion.

Test Result:

Tested Sample	Observations
Tested sample 57	No explosion and no fire occurred
Tested sample 58	No explosion and no fire occurred
Tested sample 59	No explosion and no fire occurred
Tested sample 60	No explosion and no fire occurred
Tested sample 61	No explosion and no fire occurred

All samples were complied with this clause.

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10. IEC 61951-2:2003 Clause 5 & 6 - Cell designation, marking and dimensions

Test Method:

Each jacketed cell supplied without connections shall carry durable markings giving the following minimum information:

- sealed rechargeable nickel-metal hydride or Ni-MH
- designation as specified in clause 5.1
- rated capacity
- nominal voltage
- recommended charge rate and time or permanent charge current for "T" cells
- polarity
- date of manufacture (which may be in code)
- name or identification of manufacturer or supplier

Test Result:

- Ni-MH
- Designation as specified in clause 5.1 was not provided
- 850mAh
- 1.2V
- 85mA for 16hrs
- Positive and negative polarity were marked
- Date of manufacture was not provided
- Name or identification of manufacturer or supplier was not provided

Note: In general, sealed nickel-metal hydride rechargeable single cells with connection tabs need no labels if they form an integral part of a battery, in which case, the battery itself is marked with the above information.

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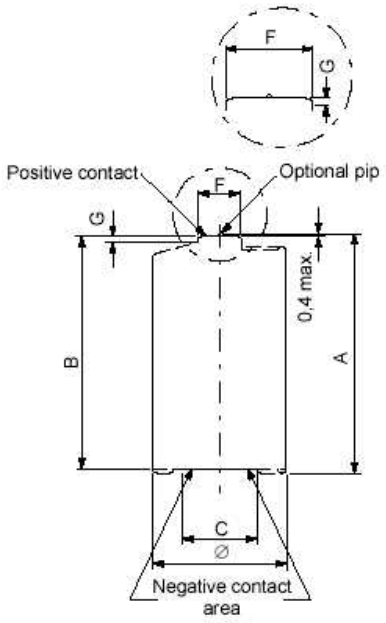
Number : HK10040541-1

10. IEC 61951-2:2003 Clause 5 & 6 - Cell designation, marking and dimensions (Cont'd)

Test Requirement:

All dimensions shall be in accordance with IEC 60086-2 clause 7.1.2:
Category 1 - Dimensions specification of R6:



A: Maximum overall height of the battery
B: Minimum distance between the flats of the positive and negative contacts
C: Minimum outer diameter of the negative flat contact surface
F: Maximum Diameter of the positive contact within the specified projection height
G: Minimum projection of the flat positive contact
ϕ: Maximum and minimum diameters of the battery

Designation	Dimensions (mm)						
	A	B	C	F	G	ϕ	
R03	Max.	Min.	Min.	Max.	Min.	Max.	Min.
	44.5	43.3	4.3	3.8	0.8	10.5	9.5

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10. IEC 61951-2:2003 Clause 5 & 6 - Cell designation, marking and dimensions (Cont'd)

Test Result:

Tested sample	Dimensions (mm)						
	A	B	C	F	G	ϕ	
Limit (R03)	Max.	Min.	Min.	Max.	Min.	Max.	Min.
	44.5	43.3	4.3	3.8	0.8	10.5	9.5
Tested sample 62	44.2	44.2	10.4	3.7	1.1	10.4	
Tested sample 63	44.1	44.1	10.4	3.7	1.0	10.4	
Tested sample 64	44.1	44.1	10.3	3.7	1.0	10.3	
Tested sample 65	44.1	44.1	10.3	3.7	1.0	10.3	
Tested sample 66	44.1	44.1	10.4	3.7	1.1	10.4	

All samples were complied with this clause.

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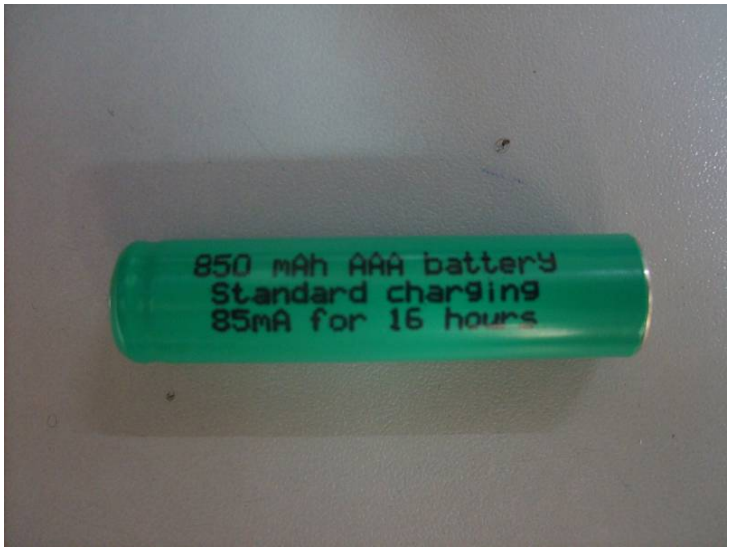
Product Marking:



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Product Photo:

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