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报告编号(Report ID): 0905113-110a

锂电池UN38.3测试报告

Lithium Battery UN38.3 Test Report

样品名称 (Samples)	Lithium Iron Phosphate Battery IFR42120/10000mAh
委托单位 (Client)	Shenzhen Mottcell Battery Technology Co., Ltd.
生产单位 (Manufacturer)	Shenzhen Mottcell Battery Technology Co., Ltd.

深圳市谱尼测试科技有限公司
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I、 SAMPLE DESCRIPTION

Sample Name	Lithium Iron Phosphate Battery		Battery Type	IFR42120/10000mAh	
Client	Shenzhen Mottcell Battery Technology Co., Ltd.				
Manufacturer	Shenzhen Mottcell Battery Technology Co., Ltd.				
Nominal Voltage	3.2V	Rated Capacity	10000mAh	Limited Charge Voltage	3.65V
Charge Current	200mA	Maximum Continuous Charge Current	20A	End Charge Current	2mA
Cut-off Voltage	2.0V	Maximum Discharge	30A	Use	---
Cells Number	1Pcs	Cell Model	IFR42120	Rated Capacity	10000mAh
Chemical component	LI, FE, P				
Client date	2009-05-11		Finished date	2009-06-02	

II、 STANDARD

Recommendations on transport of dangerous goods, manual of test and criteria, section 38.3 lithium batteries (ST/SG/AC.10/11/ section 38.3)

III、 TEST ITEM

- | | |
|------------------------|---------------------------|
| 1. Altitude simulation | 5. External short circuit |
| 2. Thermal test | 6. Impact |
| 3. Vibration | 7. Forced discharge |
| 4. Shock | |

IV、 CONCLUSION

ITEM	SAMPLE NUMBER	STANDARD	CONCLUSION
Altitude simulation	N1~N10 N11~N20	UN38.3	PASS
Thermal test			PASS
Vibration			PASS
Shock			PASS
External short circuit			PASS
Impact	N21~N25 C1~C5		PASS
Forced discharge	N26~N35 C6~C15		PASS

The submitted samples were complied with the stated requirements of ST/SG/AC.10/11/ section 38.3.

Technique Controller: *Song Wei*

Approval Date: June 2, 2009

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Add: Yingzhi Building, No.49-3, Suzhou Road, Haidian District, Beijing	Building 35, No. 680, Guiping Road, Xuhui District, Shanghai	Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
Tel: (010) 82618116	(021) 64851999	(0755) 26050909
Fax: (010) 82619629	(021) 64856403	(0755) 26068336
E-mail: pony@ponytest.com	esh@ponytest.com	sz@ponytest.com



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Notes:

- Batteries of N1~N10 are full charged after one cycle;
- Batteries of N11~N20 are full discharged after one cycle;
- Batteries of N21~N25 are half-charged after one cycle;
- Batteries of N26~N35 are full discharged after one cycle;
- Batteries of C1~C15 are full discharged after fifty cycles.

V、 PHOTO OF THE SAMPLE



Authenticate the photo on original report only

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Add: Yingzhi Building, No.49-3, Suzhou Road, Haidian District, Beijing
 Tel: (010)82618116
 Fax: (010)82619629
 E-mail: pony@ponytest.com

Building 35, No.680, Guiping Road, Xuhui District, Shanghai
 (021)64851999
 (021)64856403
 esh@ponytest.com

Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
 (0755) 26050909
 (0755) 26068336
 sz@ponytest.com



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VI、 TEST METHOD

Each cell must be subjected to test 1 to 6 and 8. Test 1 to 5 must be conducted in sequence on the same cell or battery. Test 6 and 8 should be conducted using not otherwise tested cells or batteries.

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss(\%)} = (M1-M2) / M1 \times 100$$

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the value in table blow, it shall be considered as "no mass loss".

Mass M of cell or battery	Mass loss limit
M < 1g	0.5%
1g < M < 5g	0.2%
M ≥ 5g	0.1%

In test 1 to 4, cells meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

1. Altitude simulation

Test batteries or cells shall be stored at a pressure of 11.3 kPa or less for at least six hours at ambient temperature(20±5℃).

2. Thermal test

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 interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all cells and batteries are to be stored for 24 hours at ambient temperature(20±5℃). For large cell and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

3. Vibration

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 15minutes. 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 1 g is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 g occurs (approximately 50 Hz). A peak acceleration of 8 g is then maintained until the frequency is increased to 200 Hz.

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Add: Yingzhi Building, No.49-3, Suzhou Road, Haidian District, Beijing	Building 35, No. 680, Guiping Road, Xuhui District, Shanghai	Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
Tel: (010) 82618116	(021) 64851999	(0755) 26050909
Fax: (010) 82619629	(021) 64856403	(0755) 26068336
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4. Shock

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 peak acceleration of 150 g 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.

5. External short circuit

The cell and battery to be tested shall be temperature stabilized so that its external case temperature reaches $55 \pm 2^\circ\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $55 \pm 2^\circ\text{C}$. This short circuit condition is continued for at least one hours after the cell or battery external case temperature has returned to $55 \pm 2^\circ\text{C}$. The cell or battery must be observed for a further six hours for the test to be conclude.

Cells and batteries meet this requirement if their temperature does not exceed 170°C and there is no disassembly, no rupture and no fire within six hours of this test.

6. Impact

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

Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire within six hours of this test.

7. Forced discharge

Each cell shall be forced discharged at ambient temperature by connecting its in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in Ampere).

Primary or rechargeable cells meet this requirement if there is no disassembly and fire within seven days of the test.

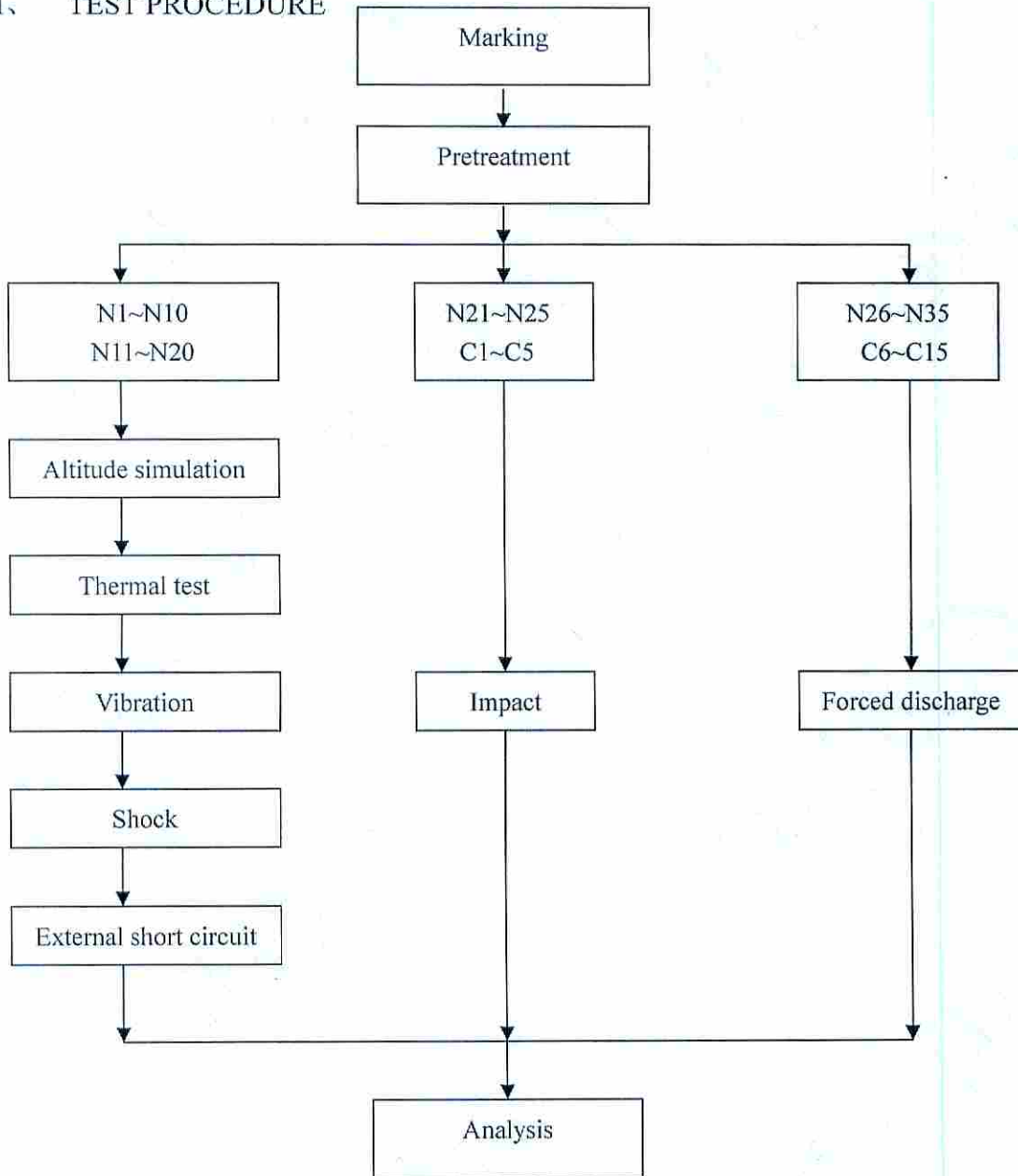
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Add: Yingzhi Building, No.49-3, Suzhou Road, Haidian District, Beijing	Building 35, No. 680, Guiping Road, Xuhui District, Shanghai	Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
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VII、 TEST PROCEDURE



VIII、 TEST APPARATUS

- SZSB-121 Rechargeable battery test system
- SZSB-037 Vacuum desiccation
- SZSB-120 Temperature circulation chamber
- SZSB-128 Vibration test instrument
- SZSB-081 Impact test instrument
- SZSB-077 DC regulated power supply
- SZSB-125 Electronic balance
- SZSB-090 Digital multimeter

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 (021) 64851999
 (021) 64856403
 csh@ponytest.com

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 (0755) 26050909
 (0755) 26068336
 sz@ponytest.com



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IX、 DATA

1. Altitude simulation

No.	Pre-test		After test		Mass loss	Voltage loss	Status
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
N1	387.737	3.396	387.736	3.395	0.000	0.03	PASS
N2	388.786	3.394	388.786	3.394	0.000	0.00	PASS
N3	388.724	3.389	388.723	3.389	0.000	0.00	PASS
N4	388.831	3.378	388.829	3.378	0.001	0.00	PASS
N5	392.505	3.385	392.504	3.384	0.000	0.03	PASS
N6	392.397	3.368	392.396	3.368	0.000	0.00	PASS
N7	388.211	3.398	388.211	3.397	0.000	0.03	PASS
N8	387.854	3.384	387.854	3.382	0.000	0.06	PASS
N9	384.835	3.407	384.833	3.406	0.001	0.03	PASS
N10	387.468	3.390	387.468	3.388	0.000	0.06	PASS
N11	390.243	---	390.243	---	0.000	---	PASS
N12	389.356	---	389.356	---	0.000	---	PASS
N13	391.800	---	391.800	---	0.000	---	PASS
N14	385.595	---	385.594	---	0.000	---	PASS
N15	389.787	---	389.787	---	0.000	---	PASS
N16	386.895	---	386.895	---	0.000	---	PASS
N17	389.516	---	389.516	---	0.000	---	PASS
N18	389.772	---	389.771	---	0.000	---	PASS
N19	386.958	---	386.956	---	0.001	---	PASS
N20	389.989	---	389.989	---	0.000	---	PASS

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 (021)64856403
 csh@ponytest.com

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 (0755)26068336
 sz@ponytest.com



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2. Thermal test

No.	Pre-test		After test		Mass loss	Voltage loss	Status
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
N1	387.736	3.395	387.644	3.335	0.024	1.77	PASS
N2	388.786	3.394	388.730	3.334	0.014	1.77	PASS
N3	388.723	3.389	388.693	3.334	0.008	1.62	PASS
N4	388.829	3.378	388.798	3.332	0.008	1.36	PASS
N5	392.504	3.384	392.474	3.333	0.008	1.51	PASS
N6	392.396	3.368	392.362	3.329	0.009	1.16	PASS
N7	388.211	3.397	388.179	3.333	0.008	1.88	PASS
N8	387.854	3.382	387.769	3.332	0.022	1.48	PASS
N9	384.833	3.406	384.751	3.334	0.021	2.11	PASS
N10	387.468	3.388	387.423	3.335	0.012	1.56	PASS
N11	390.243	---	390.202	---	0.011	---	PASS
N12	389.356	---	389.315	---	0.011	---	PASS
N13	391.800	---	391.768	---	0.008	---	PASS
N14	385.594	---	385.561	---	0.009	---	PASS
N15	389.787	---	389.737	---	0.013	---	PASS
N16	386.895	---	386.856	---	0.010	---	PASS
N17	389.516	---	389.477	---	0.010	---	PASS
N18	389.771	---	389.737	---	0.009	---	PASS
N19	386.956	---	386.922	---	0.009	---	PASS
N20	389.989	---	389.952	---	0.009	---	PASS

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Fax: (010) 82619629	(021) 64856403	(0755) 26068336
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3. Vibration

No.	Pre-test		After test		Mass loss	Voltage loss	Status
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
N1	387.644	3.335	387.644	3.334	0.000	0.03	PASS
N2	388.730	3.334	388.730	3.332	0.000	0.06	PASS
N3	388.693	3.334	388.692	3.333	0.000	0.03	PASS
N4	388.798	3.332	388.798	3.330	0.000	0.06	PASS
N5	392.474	3.333	392.472	3.331	0.001	0.06	PASS
N6	392.362	3.329	392.360	3.328	0.001	0.03	PASS
N7	388.179	3.333	388.179	3.331	0.000	0.06	PASS
N8	387.769	3.332	387.768	3.331	0.000	0.03	PASS
N9	384.751	3.334	384.750	3.332	0.000	0.06	PASS
N10	387.423	3.335	387.423	3.333	0.000	0.06	PASS
N11	390.202	---	390.201	---	0.000	---	PASS
N12	389.315	---	389.315	---	0.000	---	PASS
N13	391.768	---	391.766	---	0.001	---	PASS
N14	385.561	---	385.561	---	0.000	---	PASS
N15	389.737	---	389.736	---	0.000	---	PASS
N16	386.856	---	386.855	---	0.000	---	PASS
N17	389.477	---	389.476	---	0.000	---	PASS
N18	389.737	---	389.737	---	0.000	---	PASS
N19	386.922	---	386.922	---	0.000	---	PASS
N20	389.952	---	389.950	---	0.001	---	PASS

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Add: Yingzhi Building, No. 49-3, Suzhou Road, Haidian District, Beijing
 Tel: (010) 82618116
 Fax: (010) 82619629
 E-mail: pony@ponytest.com

Building 35, No. 680, Guiping Road, Xuhui District, Shanghai
 (021) 64851999
 (021) 64856403
 csh@ponytest.com

Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen
 (0755) 26050909
 (0755) 26068336
 sz@ponytest.com



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4. Shock

NO.	Pre-test		After test		Mass loss	Voltage loss	Status
	Mass (g)	Voltage (V)	Mass (g)	Voltage (V)			
N1	387.644	3.334	387.642	3.332	0.001	0.06	PASS
N2	388.730	3.332	388.730	3.331	0.000	0.03	PASS
N3	388.692	3.333	388.692	3.332	0.000	0.03	PASS
N4	388.798	3.330	388.798	3.330	0.000	0.00	PASS
N5	392.472	3.331	392.471	3.330	0.000	0.03	PASS
N6	392.360	3.328	392.360	3.327	0.000	0.03	PASS
N7	388.179	3.331	388.179	3.330	0.000	0.03	PASS
N8	387.768	3.331	387.768	3.329	0.000	0.06	PASS
N9	384.750	3.332	384.748	3.331	0.001	0.03	PASS
N10	387.423	3.333	387.423	3.331	0.000	0.06	PASS
N11	390.201	---	390.200	---	0.000	---	PASS
N12	389.315	---	389.315	---	0.000	---	PASS
N13	391.766	---	391.766	---	0.000	---	PASS
N14	385.561	---	385.561	---	0.000	---	PASS
N15	389.736	---	389.736	---	0.000	---	PASS
N16	386.855	---	386.854	---	0.000	---	PASS
N17	389.476	---	389.475	---	0.000	---	PASS
N18	389.737	---	389.737	---	0.000	---	PASS
N19	386.922	---	386.922	---	0.000	---	PASS
N20	389.950	---	389.950	---	0.000	---	PASS

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 Fax: (010) 82619629
 E-mail: pony@ponytest.com

Building 35, No. 680, Guiping Road, Xuhui District, Shanghai
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 (021) 64856403
 csh@ponytest.com

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 (0755) 26050909
 (0755) 26068336
 sz@ponytest.com



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5. External short circuit

No.	Peak temperature(°C)	Status
N1	118	PASS
N2	113	PASS
N3	116	PASS
N4	114	PASS
N5	112	PASS
N6	109	PASS
N7	117	PASS
N8	108	PASS
N9	115	PASS
N10	109	PASS
N11	68	PASS
N12	65	PASS
N13	69	PASS
N14	62	PASS
N15	68	PASS
N16	63	PASS
N17	67	PASS
N18	65	PASS
N19	63	PASS
N20	68	PASS

6. Impact

No.	Peak temperature(°C)	Status
N21	96	PASS
N22	94	PASS
N23	92	PASS
N24	98	PASS
N25	94	PASS
C1	63	PASS
C2	62	PASS
C3	59	PASS
C4	64	PASS
C5	58	PASS

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 (021) 64856403
 csh@ponytest.com

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 (0755) 26050909
 (0755) 26068336
 sz@ponytest.com



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7. Forced discharge

No.	Status
N26	PASS
N27	PASS
N28	PASS
N29	PASS
N30	PASS
N31	PASS
N32	PASS
N33	PASS
N34	PASS
N35	PASS
C6	PASS
C7	PASS
C8	PASS
C9	PASS
C10	PASS
C11	PASS
C12	PASS
C13	PASS
C14	PASS
C15	PASS

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Fax: (010) 82619629	(021) 64856403	(0755) 26068336
E-mail: pony@ponytest.com	cs@ponytest.com	sz@ponytest.com



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Statement

- 1、 This certification is issued according to 《Recommendations on the transport of dangerous goods -test and criteria》 published in the current year, the information of the goods and its shipment provided by the applicant (shipper or his agent).
- 2、 The conclusion of this certification is responsible only for the sample provided by the applicant . The applicant should undertake the law responsibility that result from providing untruth sample and untruth information.
- 3、 This certification will be effective only after it is signed by the Appraiser, Organizer and Checker, Technique Controller, and stamped by Pony Testing International Group.
- 4、 The certification is invalid when anything of the following happens - illegal transfer, reproduction, embezzlement, imposture, modification or tampering in any media form.
- 5、 The certification takes no account of the state and operator variations.

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Post Code: 518054

Address: 3rd Floor of Building 6, Zhongxing Industry City, Chuangye Rd, Nanshan District, Shenzhen, P.R.CHINA

Tel: 0086-0755-26050909 0086-010-82618116 0086-021-64851999

Fax: 0086-0755-26068336 0086-010-62557273 0086-021-64856403

E-MAIL: ponysz@ponytest.com

Website: <http://www.ponytestsz.com>

www.ponytest.com ☎ Hotline 400-819-5688

Add: Yingzhi Building, No.49-3, Suzhou Road, Haidian District, Beijing

Tel: (010) 82618116

Fax: (010) 82619629

E-mail: pony@ponytest.com

Building 35, No.680, Guiping Road, Xuhui District, Shanghai

(021) 64851999

(021) 64856403

csh@ponytest.com

Building 6 of Zhongxing Industry City, Chuangye Road, Nanshan District, Shenzhen

(0755) 26050909

(0755) 26068336

sz@ponytest.com