

深圳市雄韬电源科技有限公司

SHENZHEN CENTER POWER CO., LTD

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RESEARCH & DEVELOPMENT DEPARTMENT

SHENZHEN CENTER POWER CO., LTD

UN38.3 Test Report

User:

Produce Name: Iron Phosphate Lithium-ion Battery

Submittal unit: Research & Development Department

Test by: FX Liao , Aug, 20, 2010

Checked by: GJ Hu , Aug, 21, 2010

Reviewed by: JJ Tu , Aug, 21, 2010

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Sample name	Iron Phosphate Lithium-ion Battery V-LFP12V40Ah		
Submittal unit	Shenzhen Center Power CO., LTD		
Test method	United nations recommendations on the transport of dangerous Goods		
Judgment criteria	United nations recommendations on the transport of dangerous Goods		
Sample appearance	Blue square ABS container		
Date of test	2010/8/10-2010/8/20	Sample NO.	2010018
Test items	Altitude simulation, thermal test, vibration test, shock test, external short circuit, impact test, overcharge test, forced discharge test		
Test conclusion	Sample have passed the items of UN38.3 test		

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No	Test items	Criteria requirement or criteria article No.	Test result	Conclusion	Remark
1	Altitude Simulation Test	United Nations Recommendations on the Transport of dangerous Goods(4 th) thereafter call "Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.1	See attached table 1	pass	/
2	Thermal Test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.2	See attached table 2	pass	/
3	Vibration Test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.3	See attached table 3	pass	/
4	Shock Test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.4	See attached table 4	pass	/
5	External Short Circuit	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.5	See attached table 5	pass	/
6	Impact test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.6	See attached table 6	pass	/
7	Overcharge Test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.7	See attached table 7	pass	/
8	Forced Discharge Test	Manual of Tests and Criteria UN38.3(4 th)"for short, Test T.8	See attached table 8	pass	/
Test environment condition	Ambience Temperature: 20±5℃				

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Test Report-attached table 1

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No.	1	Name of Test item		Altitude Simulation				
		Before test		After test		Mass loss/%	Residual voltage/%	Other phenomenon
Sample No.	Sample state	Mass/g	Open-circuit voltage/V	Mass/g	Open-circuit voltage/V			
1	First fully charged	6450.26	13.389	6450.22	13.379	0.01	99.94	O
2	First fully charged	6450.36	13.392	6450.32	13.387	0.01	99.96	O
3	First fully charged	6450.29	13.387	6450.25	13.389	0.00	100.00	O
4	First fully charged	6450.38	13.384	6450.33	13.387	0.01	100.00	O
5	First discharged	6450.22		6450.19		0.01		O
6	First discharged	6450.39		6450.39		0.00		O
7	First discharged	6450.41		6450.38		0.01		O
8	First discharged	6450.42		6450.39		0.01		O
9	fully charged 50cycles	6450.48	13.383	6450.42	13.379	0.01	99.97	O
10	fully charged 50cycles	6450.28	13.379	6450.28	13.371	0.00	99.96	O
11	fully charged 50cycles	6451.10	13.389	6451.10	13.379	0.00	99.92	O
12	fully charged 50cycles	6450.22	13.391	6450.18	13.382	0.01	99.92	O
13	discharged 50cycles	6450.32		6450.29		0.01		O
14	discharged 50cycles	6450.33		6450.30		0.01		O
15	charged 50cycles	6450.28		6450.28		0.00		O
16	discharged 50cycles	6450.39		6450.36		0.01		O

Remark: L-leakage; V-venting; D-disassembly; R-rupture ;F-fire ; O-no venting, no disassembly, no rupture and no fi

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Test Report-attached table 2

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No.	2	Name of Test item		Thermal Test					
		Sample state	Before test		After test		Mass loss/%	Residual voltage/%	Other phenomenon
			Mass/g	Open-circuit voltage/V	Mass/g	Open-circuit voltage/V			
1	First fully charged	6450.22	13.386	6450.22	13.379	0.00	99.95	O	
2	First fully charged	6450.32	13.379	6450.30	13.372	0.01	99.95	O	
3	First fully charged	6450.25	13.378	6450.22	13.372	0.01	99.96	O	
4	First fully charged	6450.33	13.385	6450.33	13.375	0.00	99.94	O	
5	First fully charged	6450.19		6450.16		0.01		O	
6	First fully charged	6450.39		6450.36		0.01		O	
7	First fully charged	6450.38		6450.38		0.00		O	
8	First fully charged	6450.39		6450.39		0.00		O	
9	fully charged 50cycles	6450.42	13.387	6450.42	13.379	0.00	99.96	O	
10	fully charged 50cycles	6450.28	13.390	6450.28	13.383	0.00	99.95	O	
11	fully charged 50cycles	6451.10	13.382	6451.10	13.371	0.00	99.92	O	
12	fully charged 50cycles	6450.18	13.385	6450.16	13.370	0.01	99.91	O	
13	discharged 50cycles	6450.29		6450.29		0.00		O	
14	discharged 50cycles	6450.30		6450.30		0.00		O	
15	charged 50cycles	6450.28		6450.22		0.01		O	
16	discharged 50cycles	6450.36		6450.36		0.00		O	

Remark: L-leakage; V-venting; D-disassembly; R-rupture ;F-fire ; O-no venting, no disassembly, no rupture and no fi

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Test Report-attached table 3

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No.	3	Name of Test item		Vibration Test				
Sample No.	Sample state	Before test		After test		Mass loss/%	Residual voltage/%	Other phenomenon
		Mass/g	Open-circuit voltage/V	Mass/g	Open-circuit voltage/V			
1	First fully charged	6450.22	13.390	6450.20	13.384	0.01	99.96	O
2	First fully charged	6450.30	13.385	6450.30	13.371	0.00	99.92	O
3	First fully charged	6450.22	13.385	6450.22	13.374	0.00	99.93	O
4	First fully charged	6450.33	13.378	6450.33	13.371	0.00	99.93	O
5	First fully charged	6450.16		6450.12		0.01		O
6	First discharged	6450.36		6450.32		0.01		O
7	First discharged	6450.38		6450.33		0.01		O
8	First discharged	6450.39		6450.39		0.00		O
9	fully charged 50cycles	6450.42	13.383	6450.42	13.372	0.00	99.92	O
10	fully charged 50cycles	6450.28	13.377	6450.28	13.368	0.00	99.96	O
11	fully charged 50cycles	6451.10	13.381	6451.10	13.371	0.00	99.92	O
12	fully charged 50cycles	6450.16	13.388	6450.16	13.372	0.00	99.88	O
13	discharged 50cycles	6450.29		6450.25		0.01		O
14	discharged 50cycles	6450.30		6450.30		0.00		O
15	charged 50cycles	6450.22		6450.22		0.00		O
16	discharged 50cycles	6450.36		6450.33		0.01		O

Remark: L-leakage; V-venting; D-disassembly; R-rupture ;F-fire ; O-no venting, no disassembly, no rupture and no fi

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Test Report-attached table 4

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No.	4	Name of Test item		Shock Test					
		Sample state	Before test		After test		Mass loss/%	Residual voltage/%	Other phenom on
			Mass/g	Open-circuit voltage/V	Mass/g	Open-circuit voltage/V			
1	First fully charged	6450.22	13.385	6450.22	13.372	0.00	99.93	O	
2	First fully charged	6450.30	13.381	6450.28	13.382	0.01	100.00	O	
3	First fully charged	6450.22	13.382	6450.22	13.372	0.01	99.92	O	
4	First fully charged	6450.33	13.382	6450.33	13.372	0.00	99.96	O	
5	First discharged	6450.16		6450.16		0.00		O	
6	First discharged	6450.36		6450.33		0.01		O	
7	First discharged	6450.38		6450.32		0.01		O	
8	First discharged	6450.39		6450.36		0.01		O	
9	fully charged 50cycles	6450.42	13.380	6450.42	13.376	0.00	99.97	O	
10	fully charged 50cycles	6450.28	13.382	6450.28	13.366	0.01	99.88	O	
11	fully charged 50cycles	6451.10	13.389	6451.10	13.382	0.01	99.95	O	
12	fully charged 50cycles	6450.16	13.391	6450.16	13.386	0.01	99.96	O	
13	discharged 50cycles	6450.29		6450.29		0.01		O	
14	discharged 50cycles	6450.30		6450.30		0.01		O	
15	charged 50cycles	6450.22		6450.22		0.00		O	
16	discharged 50cycles	6450.36		6450.36		0.01		O	

Remark: L-leakage; V-venting; D-disassembly; R-rupture ;F-fire ; O-no venting, no disassembly, no rupture and no fi

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Test Report-attached table 5

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No.	5	Name of Test item	External short circuit
Sample No.	Sample state	External highest temperature/°C	Other phenomenon
1	First fully charged	98.5	O
2	First fully charged	97.6	O
3	First fully charged	98.0	O
4	First fully charged	97.2	O
5	First discharged	66.5	O
6	First discharged	69.2	O
7	First discharged	69.3	O
8	First discharged	68.6	O
9	fully charged 50cycles	101.5	O
10	fully charged 50cycles	97.4	O
11	fully charged 50cycles	103.0	O
12	fully charged 50cycles	98.6	O
13	discharged 50cycles	67.8	O
14	discharged 50cycles	68.9	O
15	discharged 50cycles	72.1	O
16	discharged 50cycles	68.4	O
Remark: D-disassembly; R-rupture ;F-fire ; no disassembly, no rupture and no fire			

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Test Report-attached table 7

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No.	7	Name of Test item	Overcharge Test
Sample No.	Sample state	Test phenomenon	
1	First fully charged	O	
2	First fully charged	O	
3	First fully charged	O	
4	First fully charged	O	
5	First discharged	O	
6	First discharged	O	
7	First discharged	O	
8	First discharged	O	
9	fully charged 50 cycles	O	
10	fully charged 50 cycles	O	
11	fully charged 50 cycles	O	
12	fully charged 50 cycles	O	
13	discharged 50 cycles	O	
14	discharged 50 cycles	O	
15	discharged 50 cycles	O	
16	discharged 50 cycles	O	
Remark: D-disassembly; F-fire ; O-no disassembly, and no fire			

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Test Report-attached table 8

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No.	8	Name of Test item	Forced Discharge Test
Sample No.	Sample state	Test phenomenon	
1	First fully charged	O	
2	First fully charged	O	
3	First fully charged	O	
4	First fully charged	O	
5	First discharged	O	
6	First discharged	O	
7	First discharged	O	
8	First discharged	O	
9	fully charged 50 cycles	O	
10	fully charged 50 cycles	O	
11	fully charged 50 cycles	O	
12	fully charged 50 cycles	O	
13	discharged 50 cycles	O	
14	discharged 50 cycles	O	
15	discharged 50 cycles	O	
16	discharged 50 cycles	O	
Remark: D-disassembly; F-fire ; O-no disassembly, and no fire			

For and on behalf of
SHENZHEN CENTER POWERTECH CO.,LTD.
深圳市雄韬电源科技股份有限公司



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Authorized Signature(s)