

UN/DOT 38.3

UN 38.3 Test Summary Report for Lithium Batteries



ELERIX EX-L230

[a] Cell Battery Product || Tested Type Part #: CB54173200EB || Same Type Part #: EX-L230

Lithium Iron Phosphate Cell

Lithium Cell or Battery Test Summary in Accordance with Section 2.9.4 UN Model Regulations and Sub-section 38.3 of the UN Manual of Tests and Criteria, Part III, subsection 38.3.5

TEST RESULT: PASSED

[b] Applicant	ELERIX LTD
	Enterprise House 2 Pass Street, Oldham, Manchester, United Kingdom, OL9 6HZ
	www.elerix.com

EU Representative	GIWAL LTD, o.z.
	Sterboholska 1404/104, 102 00 Praha 10 Czech Republic, EU
	www.giwal.com

[c] Certified Laboratory	Vkan Certification & Testing Co., Ltd. - No.3, Tiantai 1st Road, Kaitai Avenue, Science City, Guangzhou, Guangdong, China. - Building D, BASIGO INTELLIGENT, No.179, Guangpu East Road, Huangpu District, Guangzhou, P. R. China.
	 160008222171
	
	
	中国认可 国际互认 检测 TESTING CNAS L0095

[d] Test Report No/ID.	RZUN2021-0609	[e] Date of issue	2021-03-05
Test Results	PASSED	Validity	Permanent
[i] Tested According To:	ST/SG/AC.10/11/Rev.6/Section 38.3 UN Manual of Tests and Criteria, Part III, sub-section 38.3. third revised edition, am. 1		
[h] Battery assembly	<input checked="" type="checkbox"/> Not Applicable. <input type="checkbox"/> UN38.3.3 (f) <input type="checkbox"/> UN38.3.3 (g)		



[j] Signatory
Issued: 2021/8/13

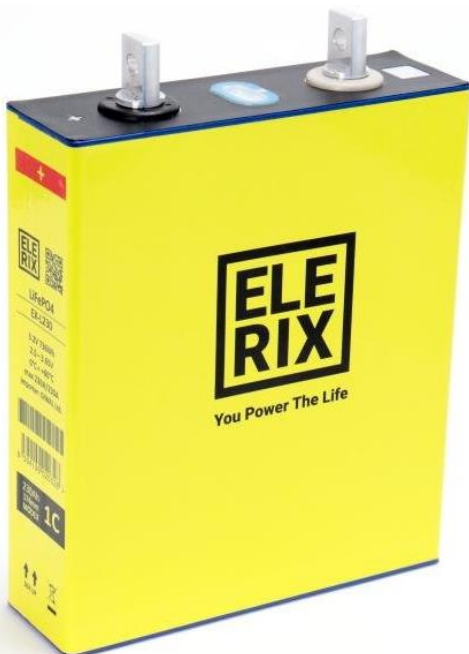
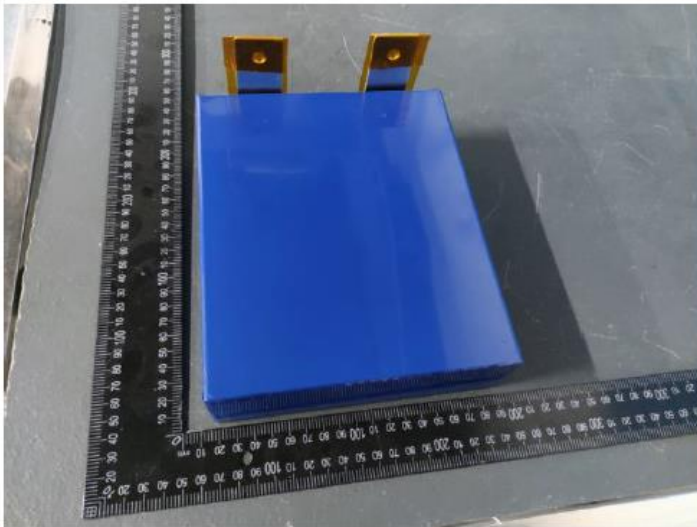
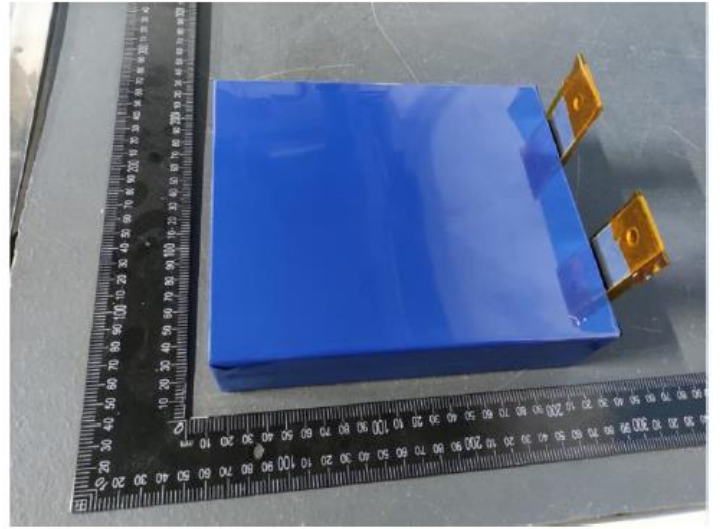
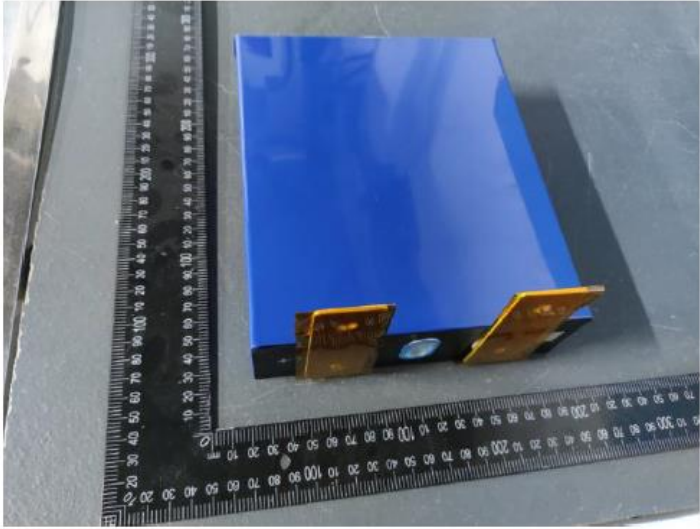
Kurt Sanders
Chief Technology Officer

APPLICANT	ELERIX LTD
	Enterprise House 2 Pass Street, Oldham, Manchester, United Kingdom, OL9 6HZ
	www.elerix.com
BRAND	ELERIX (OEM)
[f] (iv) DESCRIPTION / MODEL	EX-L230
[f] (v)	<input checked="" type="checkbox"/> Cell <input type="checkbox"/> Battery <input type="checkbox"/> Product
[f] (i) Chemistry	Li-metal (Li-Fe)
Nominal Voltage	3.2 V
Nominal Capacity	230 Ah
[f] (iii) Nominal Energy – Watthour rating	736 Wh
[f] (ii) Nominal Weight – Mass (g)	4220 g

TEST DATA RESULTS	
[g] List of Tests Conducted - Test Report ID	RZUN2021-0609
38.3.4.1 - T1 – Altitude Simulation (Primary and Secondary Cells and Batteries) Low pressure testing that simulates unpressurized airplane cargo area at 15,000-meter altitude. After storing batteries at 11.6kPa for >6 hours, these criteria shall be met: no mass loss, leaking, venting, disassembly, rupture or fire, and voltage within 10% of pre-test voltage.	PASSED
38.3.4.2 - T2 – Thermal Test (Primary and Secondary Cells and Batteries) Test covers changes in temperature extremes from -40C to +75C. Batteries are stored for 6 hours at -40C (12 hours for large cells/batteries), then 6 hours at +75C (12 hours for large cells/batteries), for a total of 10 cycles.	PASSED
38.3.4.3 - T3 – Vibration (Primary and Secondary Cells and Batteries) Test simulates vibration during transportation. Test is a Sine Sweep: 7Hz – 200Hz – 7Hz in 15 Minutes; 12 Sweeps (3 hours); 3 mutually perpendicular axes.	PASSED
38.3.4.4 - T4 – Shock (Primary and Secondary Cells and Batteries) Test also simulates vibration during transportation. Test is a Half-Sine pulse: 150G/6ms for small cells/batteries; 50G/11ms for large cells/batteries; 3 pulses per direction; 6 directions (+/-z, +/-x, +/-y).	PASSED
38.3.4.5 - T5 – External Short Circuit (Primary and Secondary Cells and Batteries) This test simulates an external short to the terminals of the cell or battery. At temperature of +55C, apply short circuit (<0.1ohm) across terminals. Maintain at least an hour after sample temperature returns to +55 +/-2°C. Pass criteria are: Case temperature does not exceed +170°C and no disassembly, rupture, or fire within 6 hours of test. Fuse, current limiting circuit, and venting mechanism activation are allowable.	PASSED
38.3.4.5 - T6 – Impact (Primary and Secondary Cells) This test is only applicable to primary and secondary cells. For cylindrical cells >20mm diameter, it simulates impact to case of cell.	PASSED
38.3.4.5 - T7 – Overcharge (Secondary Batteries) This test is for secondary or rechargeable batteries only. It simulates an overcharge condition on a rechargeable battery: 2x the manufacturer’s recommended charge current for 24 hours. Then battery shall be monitored for 7 days for fire or disassembly.	PASSED
38.3.4.5 - T8 – Forced Discharge (Primary and Secondary Cells) This testing simulates a forced discharge condition for primary and secondary cells only.	PASSED
SUMMARY OF PERFORMED TESTS	ALL PASSED

PHOTOS OF PRODUCTS AND SAMPLES

Cell/电芯 (CB54173200EB 3,2V 230Ah 736Wh)



TECHNICAL SUMMARY OF THE TEST DATA

Ref. No. RZUN2021-0609

Table1: T1~T5 / 表 1. 试验 1~试验 5

Sample No. 样品号	Mass prior to test / 试验前质量(kg)	OCV prior to test / 试验前电压(V)	Test T.1: Altitude simulation/ 试验 T.1: 高度模拟		Test T.2: Thermal test/ 试验 T.2: 温度试验		Test T.3: Vibration/ 试验 T.3: 振动		Test T.4: Shock/ 试验 T.4: 冲击		Test T.5: External Short Circuit/ 试验 T.5 外部短路
			Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Temp. (°C) 温度 (°C)
c1#	4,20	3,350	0,000	99,97	0,000	99,55	0,000	99,97	0,000	100,00	57,7
c2#	4,22	3,350	0,000	99,97	0,000	99,55	0,000	99,97	0,000	99,97	57,5
c3#	4,22	3,347	0,000	99,97	0,000	99,61	0,000	99,94	0,000	99,97	57,8
c4#	4,21	3,349	0,000	99,94	0,000	99,58	0,000	99,97	0,000	100,00	57,4
c5#	4,21	3,349	0,000	99,97	0,000	99,55	0,000	99,97	0,000	100,00	57,9
c6#	4,20	3,350	0,000	99,97	0,000	99,55	0,000	99,94	0,000	100,00	57,3
c7#	4,22	3,347	0,000	99,97	0,000	99,58	0,000	99,94	0,000	99,97	57,4
c8#	4,21	3,348	0,000	99,97	0,000	99,58	0,000	99,94	0,000	99,97	57,8
c9#	4,21	3,348	0,000	99,97	0,000	99,61	0,000	99,94	0,000	100,00	57,7
c10#	4,20	3,351	0,000	99,97	0,000	99,52	0,000	99,94	0,000	99,97	57,3

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Table2: Crush / 表 2: 挤压

Test T.6: Crush/试验 T.6: 挤压	Sample No. 样品号	c11#	c12#	c13#	c14#	c15#	c16#	c17#	c18#	c19#	c20#	
	OCV prior to test / 试验前电压 (V)	3,296	3,296	3,295	3,296	3,295	3,296	3,296	3,294	3,295	3,295	3,296
	Temp. (°C) 温度 (°C)	24,7	24,9	24,3	24,6	24,3	24,5	24,5	24,8	24,2	24,8	

Table 3: Forced discharge / 表 3. 强制放电

Test T.8: Forced discharge / 试验 T.8: 强制放电	Sample No. 样品号	c21#	c22#	c23#	c24#	c25#	c26#	c27#	c28#	c29#	c30#
	OCV prior to test / 试验前电压(V)	2,786	2,783	2,773	2,796	2,781	2,796	2,794	2,803	2,788	2,791
	Sample No. 样品号	c31#	c32#	c33#	c34#	c35#	c36#	c37#	c38#	c39#	c40#
	OCV prior to test / 试验前电压(V)	2,775	2,790	2,774	2,783	2,785	2,794	2,791	2,798	2,785	2,793