

August 25, 2015

ZLand®

FairfieldNodal Lithium Ion Battery Pack Testing – 221.6947.0001

**UN Manual of Tests and Criteria, Part III, Subsection 38.3
Underwriters Laboratories Inc., October 21, 2008, their reference SV17457, Project 08CA43185.**

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2008/10/21

Fairfield Industries Inc.
Attn: Mr. Glen Herzog
14100 SW FWY #600
Sugar Land,
TX 77478-3484 US

Our Reference: SV17457, Project 08CA43185

Subject: UN DOT Tests T1-T5 (pack), T6 (ICR18650 cells from pack), and T7 (pack) on the Secondary Li-ion Battery Packs 221.6947.0001 (4s/5p cells), in accordance with the UN Manual of Tests and Criteria, Part III, Subsection 38.3, Third Edition.

Dear Mr. Glen Herzog:

As requested, we have subjected the Secondary Li-ion Battery Packs 221.6947.0001 (4s/5p cells) to the following tests, in accordance with the UN Manual of Tests and Criteria, Part III, Subsection 38.3, Third Edition.

<u>UN DOT Tests</u>	<u>Li-ion Battery Packs 221.6947.0001 (4s/5p cells)</u>			
	<u>Fully Charged</u> <u>(1st Cycle)</u>	<u>Fully Discharged</u> <u>(1st Cycle)</u>	<u>Fully Charged</u> <u>(50th Cycles)</u>	<u>Fully Discharged</u> <u>(50th Cycles)</u>
T1-Altitude Simulation	Comply	Comply	Comply	Comply
T2-Thermal	Comply	Comply	Comply	Comply
T3-Vibration	Comply	Comply	Comply	Comply
T4-Shock	Comply	Comply	Comply	Comply
T5-External Short Circuit	Comply	Comply	Comply	Comply
T6-Impact (pack cells)	Comply(50% capacity)	-	-	Comply
T7-Overcharge	Comply	-	Comply	-

The detailed results of our investigation are attached in Datasheets Package as an appendix to this letter.

No Follow-Up Service is being established and no reference may be made to UL on or in connection with the product.

Fairfield Industries Inc. supplied all of the test samples for testing by UL. UL did not select the no. of samples or determine whether the samples provided were representative of other manufactured products. UL tested the samples in accordance with the requirements in the UN Manual of Tests and Criteria, Part III, Subsection 38.3, Third Edition. The test results apply only to the supplied no. of samples actually tested by UL.

This completes our work under the Project 08CA43185. With this letter, we are closing the Project 08CA43185.

If you have questions or comments on this information, please feel free to contact us.

Very truly yours,

Reviewed by,

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A not-for-profit organization
dedicated to public safety and
committed to quality service

August 19, 2015

ZLand[®] UN 38.3 Battery Pack Testing

Testing required under UN Manual of Tests and Criteria, Part III, Subsection 38.3 was successfully completed on the FairfieldNodal lithium ion battery pack part number **221.6947.0001** by **Underwriters Laboratories Inc.** on **October 21, 2008**, their reference **SV17457, Project 08CA43185**.

I confirm FairfieldNodal lithium ion battery pack part numbers; **221.6947.0002, 221.6947.0004, 221.7529.0001 and 221.7529.0002** are the same design, manufacturing process and do not differ from the tested type outlined in 38.3.2.2 shown below.

This battery pack is used in the following ZLand Nodes;

ZLand[®] Nodes; 221.6906.0001 to 0004 and 221.6906.0007 to 0011

ZLand[®], Ext Conn Nodes; 221.7520.0001 to .0004

ZLand[®], Aux Nodes; 221.7484.0001 & .0002

I do hereby certify these facts to be true and correct to the best of my knowledge.

FAIRFIELDNODAL
Phil Richards



Date 8/26/2015

Land Product Development Manager

Validated

William Guyton



Date 8/27/15

Manager of Engineering

38.3.2.2 Lithium metal and lithium ion cells and batteries shall be subjected to the tests, as required by special provisions 188 and 230 of Chapter 3.3 of the Model Regulations prior to the transport of a particular cell or battery type. Cells or batteries which differ from a tested type by:

- (a) For primary cells and batteries, a change of more than 0.1 g or 20% by mass, whichever is greater, to the cathode, to the anode, or to the electrolyte;
- (b) For rechargeable cells and batteries, a change in nominal energy in Watt-hours of more than 20% or an increase in nominal voltage of more than 20%; or
- (c) A change that would lead to failure of any of the tests, shall be considered a new type and shall be subjected to the required tests.

NOTE: The type of change that might be considered to differ from a tested type, such that it might lead to failure of any of the test results, may include, but is not limited to:

- (a) A change in the material of the anode, the cathode, the separator or the electrolyte;
- (b) A change of protective devices, including hardware and software;
- (c) A change of safety design in cells or batteries, such as a venting valve;
- (d) A change in the number of component cells; and
- (e) A change in connecting mode of component cells.

In the event that a cell or battery type does not meet one or more of the test requirements, steps shall be taken to correct the deficiency or deficiencies that caused the failure before such cell or battery type is retested.