

## Lithium, Lithium-Ion and Lithium Polymer Cell and Battery Transportation Testing

### Ultralife Testing Service for UN T1 - T8

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#### Transportation Testing Requirements

The transportation of primary (non-rechargeable) lithium and rechargeable lithium ion and lithium polymer cells and batteries is regulated in the United States in accordance with Part 49 of the Code of Federal Regulations, (49 CFR Sections 100-185) of the US Hazardous Materials Regulations (HMR).

The international transportation of lithium cells and batteries is regulated by the International Civil Aviation Organization (ICAO) Technical Instructions and corresponding International Air Transport Association (IATA) Dangerous Goods Regulations, and the International Maritime Dangerous Goods (IMDG) Code.

Under United Nations transportation regulations, all primary lithium and rechargeable lithium ion and lithium polymer cells and batteries must comply with the UN T1 – T8 testing requirements prior to being shipped.

The following tests are specified in the Fourth revised edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (ST/SG/AC.10.11/Rev. 4), Part III, subsection 38.3:

<b>T1:</b> Altitude Simulation	<b>T2:</b> Thermal	<b>T3:</b> Vibration	<b>T4:</b> Shock
<b>T5:</b> External Short Circuit	<b>T6:</b> Impact	<b>T7:</b> Overcharge	<b>T8:</b> Forced Discharge

These tests only have to be performed once for each cell or battery of a given design. Additional testing is required when a previously tested cell or battery undergoes design or construction changes as follows:

- (a) 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; or
- (b) A change that would materially affect the test results.

#### Testing Service Cost and Timing

Ultralife has the capability to perform all of the UN T1 - T8 tests in-house at its Newark, New York facility for the following chemistries: Li-MnO<sub>2</sub>, Lithium Ion and Lithium Polymer.

Testing completion time can vary depending on battery type and fixture requirements.

*Please contact Ultralife for information on testing costs and timing.*

Upon completion of testing, Ultralife will issue a test report containing a description of the tests performed and the test results.

For additional information on this testing service, or to arrange to have your cells or batteries tested, please contact your Ultralife sales representative, or Customer Service:

US: Tel: 800-332-5000 • Fax: 315-331-7800 • E-mail: [sales@ulbi.com](mailto:sales@ulbi.com)