

Dear Valued Business Partner,

Progressive Technologies Inc (PTI) is committed to providing quality products on time every time and also to meeting and/or exceeding industry standards and regulations. As you are probably aware, there were several changes and additions to regulations in the past few years that may or may not affect the cells and batteries (packs) that you purchase from us. Following is a brief summary of each directive and it's effect on your products:

1. RoHS (Restriction of the use of Hazardous Substances) directive (2002/95/EC)
2. WEEE (Waste of Electrical and Electronic Equipment) directive (2002/96/EC)
3. Lithium Transport

The RoHS and WEEE directive were both recommended by the European Parliament and Council of the European Union (EU) as a means to control hazardous substances being discarded into landfills and subjecting the environment to potentially harmful substances. RoHS places restrictions on the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls(PBB), and polybrominated diphenylethers (PBDE) in electrical and electronic equipment. However, this directive specifically excludes cells and batteries from the scope because these items are already covered under the Battery Directive (2006/66/EC). WEEE provides for the free recycling and appropriate marking of electrical and electronic equipment. This directive requires that cells and batteries be removed from the equipment prior to disposal, at which time, these items fall within the scope of the battery directive. Therefore, when handled properly, cells and batteries are excluded from the scope of both the RoHS and WEEE directives.

The transport of lithium-based products has different regulations depending on whether it is a domestic or international shipment. Domestic shipments are governed by the Department of Transportation (DoT), while international shipments are dependent upon the mode of transportation, by air (IATA), by ship (IMO), and by truck (ADR). Please see attachment in regards to more details concerning testing and packaging requirements as well as class 9 designation. In addition to these regulations, lithium primary cells and packs have further requirements. Effective December 29th 2004, all lithium primary cells and batteries are prohibited on passenger aircraft and must be labeled accordingly.

We take great pride in the quality products and service that we offer you and want to do our best in keeping you informed so that you can plan and design your products based on the latest technologies and regulations. If you have additional questions, please contact us at your convenience.

Sincerely

Steven A Turner
Operations Manager



The following information is a summary of PTI's interpretation of the latest regulations concerning the transport of lithium based cells. This document may not contain the most current, complete or accurate info. Therefore, it is strongly advised that all users of lithium based products do further research as it is the responsibility of each shipper to be in compliance.

Lithium Regulations

Application:

Lithium primary, lithium ion, lithium polymer, lithium thionyl chloride, lithium sulfur dioxide, lithium sulfonyl chloride, and any others that contain lithium.

Testing:

All cells and pack designs will have to be tested unless they meet the criteria for exceptions.

Exceptions:

International:

All lithium based battery cells and packs are required to be tested .

Domestic:

The following do not require testing if shipped within the US:

1. Lithium primary cells (liquid cathode) with up to .5 grams of lithium.
2. Lithium primary cells (solid cathode) with up to 1.0 grams of lithium.
3. Lithium primary packs with up to 2 grams of lithium.
4. Lithium-ion (and any other rechargeable lithium chemistries) cells with up 1.5 grams of equivalent lithium content.
5. Lithium-ion (and any other rechargeable lithium chemistries) packs with up to 8 grams of equivalent lithium content(2aH pack doesn't require testing if less than 13 cells, 2.2 if less than 12 cells, 2.4 if less than 11 cells, 2.6 if less than 10 cells).

What tests? UN T1-T8

T1- Altitude simulation

T2- Thermal test

T3- Vibration

T4- Shock

T5- External short circuit

T6- Impact

T7- Overcharge

T8- Forced discharge

Who?

Testing is the responsibility of the cell manufacturer for any cells and packs manufactured or assembled by them. The manufacturer typically absorbs the associated costs.

The assembler shall ensure that all required testing is completed for pack designs assembled by them, prior to shipping. Financial responsibility is per agreement between assembler and customer.

Testing requirements apply to designs; therefore two or more packs that are identical in configuration require only 1 testing phase (T1-T8).

A design is not identical and will have to be tested if:

1. there is a change of more than .1 gram or 20% by mass to the cathode, anode or electrolyte
2. the change would materially affect the test results

Note: Cells and battery packs of identical design only have to be tested one time, even if they are manufactured in and shipped from multiple locations.

PTI's Progress:

We are currently pursuing these options:

1. Subcontract: \$5700-\$8500 depending on contractor, chemistry, and quantity plus cost of sample packs.
2. Customers complete testing independent of PTI.

Packaging

Packaging requirements are dependent upon classification (class 9 or non-classified).

What is class 9?

Domestic Requirements:

Class 9 is a general class designation by the DOT and has specific packaging instructions.

Lithium cells (primary)

Lithium cells are class 9 if they contain more than 5.0 grams of lithium

Battery packs are class 9 if they contain more than 25 grams of lithium.

Lithium Ion (secondary)

Lithium ion cells are class 9 if the capacity multiplied by .3 is greater than 5.0.

Battery packs are class 9 if the capacity multiplied by .3 multiplied by number of cells is greater than 25.

ex CGR18650A is 2 AH therefore $2ah \times .3 = .6$ so one cell up to 41 cells in a pack is not class 9. 42 cells in a pack becomes class 9 ($.3 \times 2 \times 42 = 25.2$).

How?

Non-classified cells and packs (not class 9)

If package contains more than 24 cells or more than 12 packs, then the following applies:

1. Package must indicate that it contains lithium.
2. Package must withstand 1.2 meter drop test without causing damage to the contents.
3. Package must not exceed 66.1 lbs.
4. Package should contain a note explaining that the cells are excepted from class 9.
5. All packages that contain lithium primary must state that “Primary lithium batteries forbidden for transport aboard passenger aircraft.”

Class 9

Product handlers must be tested and certified.

Packaging must meet Group II requirements-boxes have to be tested by UN specifications (i.e. 4G/Y.20.6/S/01/USA/M5032-56).

Packaging must be marked indicating:

Lithium batteries,
UN3090,
PG II
Number of packages
Emergency phone number
Shipper certification

Who?

The requirements apply to anyone that ships these products including customers.

Shipping info:

In addition to DOT and international regulations:

UPS requires that we purchase software (\$250-\$750 per year) and pay an additional hazmat fee of \$20 per package.

Overnite requires hazmat fee of \$9 per shipment.

USPS requires \$8 per shipment and has constraints on the amount of lithium that can be contained in a package.

PTI's Progress:

1. We are shipping in compliance with the new domestic (DoT regulated) shipping requirements, but if customers ship internationally, there may be additional requirements. Please contact PTI personnel for costs or contact information.
2. We have researched the various options concerning testing and have reached these conclusions: in some instances, it may be more advantageous for our customers to have the testing done directly, but in others, may be more economically feasible for PTI. We will determine this on a per customer per project basis after reviewing with each customer.