

TRANSPORT INFORMATION for LITHIUM ION POLYMER & LITHIUM IRON PHOSPHATE BATTERIES

1 GENERAL

- The transport of Lithium ion batteries is subject to international regulation which can differ if the batteries are transported by air, sea or road. There are a range of fines for companies (including OEMs) who do not comply with these regulations.
- All Lithium ion batteries must undergo mechanical and electrical tests which simulate the effects of transportation.
- Lithium ion batteries, which have been transportation tested, may need to be transported as class 9 dangerous goods which impose strict packaging, labelling and documentation requirements on those shipping the product.
- Special training and certification is required for those wishing to ship class 9 dangerous goods.
- There are restrictions on the number and size of Lithium ion batteries which can be taken on board aircraft (as carry on or checked in luggage).

In this document, any reference to Lithium Ion also includes Lithium Ion Polymer and Lithium Iron Phosphate.

2 SCOPE

This document has been written without reference to Lithium (rechargeable) cells or lithium (primary) cells or batteries. This has been done for the purposes of clarity.

This document has been written based on our understanding of the latest regulations. It should be noted that regulations are subject to constant review in the light of new technical developments and changing requirements of industry and transportation. States and operators may impose further restrictions to the regulations at any time.

3 INTERNATIONAL REGULATIONS

International transportation regulations require battery manufacturers or companies that ship equipment packed with or containing these batteries to meet UN testing, marking, packaging, labeling and shipping paper specifications.

The transport of dangerous goods is regulated in order to prevent, as far as possible, accidents involving people or property, damage to the environment, to the means of transport employed or to other goods being transported. Each mode of transport, air, sea and road has its own regulations:

- Safe transport of dangerous goods by air (ICAO/IATA)
- Dangerous goods by sea (IMDG)
- Dangerous goods by road within Europe (ADR)

Although separate, they are now largely harmonized with the Model Regulations, published by United Nations Economic and Social Council's Committee of Experts on the Transport of Dangerous Goods.

Lithium batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- o UN 3480, Lithium ion batteries
- o or, if inside a piece of equipment or packed separately with a piece of equipment as:
 - o UN 3481, Lithium ion batteries contained in equipment; or
 - o UN 3481, Lithium ion batteries packed with equipment.

In the absence of exceptions, these batteries must be shipped in quantities that comply with the limitations contained in the Dangerous Goods Regulations (DGR). They must be contained in a UN specification packaging as prescribed by the applicable packing instruction in the DGR. A completed package must display a Class 9 hazard label in addition to markings that identify the applicable proper shipping name and UN number.

A shipper must document the shipment using a Shipper's Declaration for Dangerous Goods. Beginning 1 Jan 2013 the classification criteria for lithium batteries stipulates that cells and batteries must be manufactured under a quality management program.

4 TRANSPORT OF DANGEROUS GOODS BY AIR (ICAO/IATA)

The following information is a summary of the conditions that apply to various sizes of batteries for air transport. There are many more conditions that must be met.

For full details of the conditions, please refer to the Dangerous Goods Regulations

4.1 Lithium Ion Batteries (on their own - this includes batteries c/w chargers and accessories)

- o All batteries must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3.
- o Dangerous goods training needed for persons preparing the shipment
- o Batteries must have the Wh rating on the outside of the battery case
- o Batteries must be packed in such a way as to prevent short circuits

4.1.1 Batteries more than 100Wh

- Packing instruction 965 section 1A applies
- UN Specified Packaging to packing group II
- "UN3480 Lithium Ion Batteries" label on box
- Full class 9 labelling on box (no Lithium Battery handling label needed)
- "To" and "From" address labels needed
- Shippers Declaration for Dangerous Goods needed
- Limits: Passenger aircraft - 5kg Net maximum
Cargo aircraft - 35Kg Net Maximum ("Cargo Aircraft Only" sticker needed)

4.1.2 Batteries equal to or less than 100Wh - but for quantities higher than allowed in Packing Instruction 965 section II

- Packing instruction 965 section 1B applies
- Strong Packaging which has had the appropriate tests
- "UN3480 Lithium Ion Batteries" label on box
- Full class 9 labelling on box
- Lithium Battery handling label
- "To" and "From" address labels needed
- Shippers Declaration for Dangerous Goods needed (1B must be marked on the declaration).
- Limits: Passenger & Cargo aircraft - 10kg Net maximum

4.1.3 Batteries equal to or less than 100Wh

- Packing instruction 965 section II applies
- Strong Packaging
- Lithium Battery handling label
- Lithium ion battery handling document needed
- Limits: Passenger & Cargo aircraft
- Wh rating 2.7Wh or less - 2.5kg net maximum, any quantity allowed
- Wh rating more than 2.7Wh but less than 100Wh - no weight limit, only 2 batteries

4.2 Lithium Ion Batteries packed with equipment (but not contained in equipment)

- o All batteries must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3
- o Dangerous goods training needed for persons preparing the shipment
- o Batteries must have the Wh rating on the outside of the battery case
- o Batteries must be packed in such a way to prevent short circuits

4.2.1 Batteries more than 100Wh

- Packing instruction 966 section I applies
- UN Specified Packaging to packing group II

- “UN3481 Lithium Ion Batteries packed with equipment” label on box
 - Full class 9 labelling on box (no Lithium Battery handling label needed)
 - “To” and “From” address labels needed
 - Shippers Declaration for Dangerous Goods needed
 - Only enough batteries to be packed to operate equipment + 2 spares
- Limits: Passenger aircraft - 5kg Net maximum
Cargo aircraft - 35Kg Net Maximum (“Cargo Aircraft Only” sticker needed)

4.2.3 Batteries equal to or less than 100Wh

- Packing instruction 966 section II applies
 - Strong Packaging
 - Lithium Battery handling label
 - Lithium ion battery handling document needed
 - Only enough batteries to be packed to operate equipment + 2 spares
- Limits: Passenger & Cargo aircraft - 5kg net maximum

4.3 Lithium Ion Batteries packed with equipment

- o All batteries must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3
- o Dangerous goods training needed for persons preparing the shipment
- o Batteries must have the Wh rating on the outside of the battery case
- o Batteries must be packed in such a way to prevent short circuits

4.3.1 Batteries more than 100Wh

- Packing instruction 966 section I applies
 - UN Specified Packaging to packing group II
 - “UN3481 Lithium Ion Batteries packed with equipment” label on box
 - Full class 9 labelling on box (no Lithium Battery handling label needed)
 - “To” and “From” address labels needed
 - Shippers Declaration for Dangerous Goods needed
 - Only enough batteries to be packed to operate equipment + 2 spares
- Limits: Passenger aircraft - 5kg Net maximum
Cargo aircraft - 35Kg Net Maximum (“Cargo Aircraft Only” sticker needed)

4.3.2 Batteries equal to or less than 100Wh

- Packing instruction 966 section II applies
 - Strong Packaging
 - Lithium Battery handling label
 - Lithium ion battery handling document needed
 - Only enough batteries to be packed to operate equipment + 2 spares
- Limits: Passenger & Cargo aircraft - 5kg net maximum

5 TRANSPORT WITHIN PASSENGER BAGGAGE

The following information is a summary from the regulations concerning what can be taken on board an aircraft by passengers and crew.

- o All batteries must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3
- o Batteries must be packed in such a way to prevent short circuits

SPARE LITHIUM BATTERIES - Lithium ion batteries for portable electronic devices (including medical devices) with a Wh rating exceeding 100 Wh but not exceeding 160 Wh. Maximum of two spare batteries in carry-on baggage only.

- Permitted in or as carry-on baggage - YES
- Permitted in or as checked luggage - NO
- Permitted on one's person - YES
- The approval of the operator(s) is required - YES
- The pilot in command must be informed of the location - NO

LITHIUM BATTERY POWERED ELECTRONIC DEVICES - Lithium ion batteries for portable (including medical) electronic devices, a Wh rating exceeding 100 Wh but not exceeding 160 Wh.

- Permitted in or as carry-on baggage - YES
- Permitted in or as checked luggage - YES
- Permitted on one's person - YES
- The approval of the operator(s) is required - YES
- The pilot in command must be informed of the location - NO

PORTABLE ELECTRONIC DEVICES (INCLUDING MEDICAL DEVICES) CONTAINING LITHIUM ION BATTERIES, such as watches, calculating machines, cameras, cellular phones, lap-top computers, camcorders etc., when carried by passengers or crew for personal use. Batteries must not exceed 100Wh for Lithium Ion batteries.

- Permitted in or as carry-on baggage - YES
- Permitted in or as checked luggage - YES
- Permitted on one's person - YES
- The approval of the operator(s) is required - NO
- The pilot in command must be informed of the location - NO

ALL SPARE BATTERIES, INCLUDING LITHIUM ION BATTERIES for such portable electronic devices must be carried in carry-on baggage only. These batteries must be individually protected to prevent short circuits.

- Permitted in or as carry-on baggage - YES
- Permitted in or as checked luggage - NO
- Permitted on one's person - YES
- The approval of the operator(s) is required - NO
- The pilot in command must be informed of the location - NO

6 TRANSPORT OF DANGEROUS GOODS BY ROAD & SEA (ADR & IMDG)

The following information is a summary of the conditions that apply to various sizes of batteries for sea transport. There are many more conditions that must be met.

For full details of the conditions, please refer to the Dangerous Goods Regulations

6.1 Lithium Ion Batteries (on their own - this includes batteries c/w chargers and accessories) & Packed with equipment and Contained in equipment.

- o All batteries must be tested in accordance with the UN Manual of Tests and Criteria Part III Subsection 38.3
- o Dangerous goods training needed for persons preparing the shipment
- o Batteries must have the Wh rating on the outside of the battery case
- o Batteries must be packed in such a way as to prevent short circuits

6.1.1 Batteries more than 100Wh

- Packing instruction 903 applies
- UN Specified Packaging to packing group II
- "UN3480 Lithium Ion Batteries" or "UN3481 Lithium Ion Batteries packed with equipment" or "UN3481 Lithium Ion batteries contained in equipment" label on box.
- Full class 9 labelling on box (no Lithium Battery handling label needed)
- "To" and "From" address labels needed
- Shippers Declaration for Dangerous Goods needed

Limits: 30Kg Gross per package

6.1.2 Batteries equal to or less than 100Wh

- Special provision 188 applies
- Strong Packaging
- Lithium Battery handling label
- Lithium ion battery handling document needed

Limits: 30Kg Gross per package

7 RETURNING LITHIUM ION BATTERIES TO TRACER POWER

Anyone offering Lithium ion batteries for transport must follow the regulations. Note that Lithium Ion batteries being shipped for recycling or disposal are prohibited from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

8 OTHER INFORMATION

Disclaimer

Important: This document contains information which only relates to secondary (rechargeable) Lithium ion batteries (including Lithium ion polymer & Lithium Iron Phosphate). It does NOT cover primary (non rechargeable) Lithium cells or Lithium batteries. Information has been provided based on our understanding International regulations. Domestic regulations for individual counties or states can and does vary. While every attempt has been made to ensure the accuracy of the advice in this document, no claim or guarantee is made by Tracer Power for accuracy, completeness, applicability or compliance to the regulations which are subject to change. Tracer Power shall not be liable for any inclusions, omissions, errors or outdated information. This document does not constitute, and should not be considered legal advice. In all cases we recommend that you fully research the topic and seek appropriate advice from regulatory authorities to ensure your compliance with all applicable regulations.