IUMI Policy Agenda

12. Transport of lithium-ion batteries (LIBs)

Brief description

In light of the efforts to combat climate change and to reduce the dependence on fossil In light of the efforts to combat climate change and to reduce the dependence on fossil fuels, new sources of energy and energy storage systems are being developed and constantly evolve. This has led to the increased use of lithium-ion batteries (LIBs) in all kinds of electronic devices, appliances, battery energy storage systems (BESS) and small vehicles. Unlike the LIBs incorporated in BESS and in electric cars, smaller devices which include LIBs do not have a battery management system which ensures that the battery operates within its safety parameters.

This section will focus on LIBs carried as cargo and LIBs within electronic devices. The peculiarities to consider when transporting BESS are not addressed since currently only limited knowledge is available on risks and loss prevention measures associated with their carriage.

With the number of LIBs in use growing, they are being shipped as cargoes across all modes of transport. This includes new, used and damaged batteries as well as electronic devices. If such cargoes are not handled, packaged, classified and declared correctly, they can be hazardous to people, property and the environment.

A risk associated with LIBs is thermal runaway (TR): Under certain conditions such as electrical abuse, heat, or mechanical abuse, an increase in the internal temperature of a lithium-ion cell can be triggered. This can initiate reactions which release heat, i.e. causing a heat-temperature loop. If the heat does not dissipate, the battery cell temperature will increase further, thereby accelerating the process of heat release. The battery enters an uncontrollable self-heating state. TR can affect adjacent cells and nearby materials, thus causing fire. In addition to the fire risk, TR reaction products also contain toxic substances. The toxicity characteristics applicable to potential gas clouds and their residues remain after a fire has been extinguished. If TR occurs, it is important to consider that even if the flames have been suppressed, this may not suffice to interrupt/stop the TR chemical reaction. Due to such risks, LIBs are classified as Class 9 dangerous goods. This means that they are subject to regulations on packaging, labelling, quantity limits, training, and reporting.

To ensure the safe handling of LIBs in the global supply chain it is crucial to comply with international safety regulations. Stakeholders involved in shipping or storing of LIBs must be aware of relevant information and communicate it to all those involved in the handling of the cargo. Guidance is included in the International Maritime Dangerous Goods (IMDG) Code, the Code of Practice for Packing of Cargo Transport Units (CTU Code), the Cargo Stowage and Securing (CSS) Code and the CINS Lithium-ion Batteries in Containers

Guidelines. Training for staff involved with the handling of these cargoes is crucial to ensure they are aware of the risks and know how to handle them in case of an incident.

Relevant authority / organisations and documents

- Cargo Incident Notification System (CINS): Lithium-ion Batteries in Containers Guidelines, March 2023
- IATA Battery Guidance Document, Revised for the 2025 Regulations

IUMI will:

- IUMI will support the development of appropriate guidelines and safety measures to address the risks associated with the carriage of LIBs.