

Un 3480 lithium ion batteries

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Many modern products and devices, including electric cars are powered by lithium-ion batteries. When it comes to transporting lithium-ion batteries, extra caution should be observed due to their risk of fire. For this reason, lithium batteries are classified as dangerous goods and specific guidelines must be observed for their transit. Read on to find out more on safe lithium-ion battery transport, what transportation regulations need to be followed and what you should look out for before and during transit.

Due to their highly reactive nature, lithium-ion batteries are particularly vulnerable to external environmental factors when moved from one place to another. Mechanical forces, temperature changes and accidental impact could cause them to become distorted, for example. Due to this risk, these batteries are categorised as dangerous goods and should be transported with caution.

A thermal runaway is an unstoppable chain reaction that occurs within a lithium-ion battery, resulting in a fire that is extremely difficult to extinguish. It takes place when the internal temperature within the lithium-ion battery rises causing stored energy to be released within a matter of milliseconds. Poisonous heavy metal deposits and fumes are produced and released into the surrounding environment. Material parts of the battery can also be discharged.

It is also very important to implement proper fire prevention procedures to ensure safety when transporting lithium-ion batteries by road or air. Transport and shipping regulations can also change depending on the function and construction of the lithium-ion battery. It is advised to conduct a full risk assessment to determine the appropriate protective measures needed.

Lithium-ion battery transportation and shipping requirements state that battery units transported by road must clearly be marked in accordance with ADR (the Agreement Concerning the International Carriage of Dangerous Goods by Road). Differently sized labels are required depending on the size of the package being transported. Currently, a measurement of 100mm x 100mm is required for bigger packing labels; 100mm x 70mm is adequate for smaller shipment units.

Specialised safety containers used for storing lithium-ion batteries are also suitable when it comes to transporting them. The regulations for packing group II must be followed for the transportation of lithium-ion batteries, except in cases where the battery is defective or damaged - in which case, packing group I regulations should be adhered to.

Defective lithium-ion batteries are particularly prone to risk of fire during transportation -especially if a battery weighs more than 500 grams. The following characteristics indicate that a battery could be damaged:

When transporting damaged lithium-ion batteries by road there is a high risk of a thermal runaway occurring

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(this is usually activated by vibrations on bumpy roads or sudden braking). It is important that the specific shipping and packing regulations surrounding the transportation of lithium-ion batteries are applied here. It is also important to note that the applicable provisions of the DGR have been adhered to. This includes not charging lithium batteries above 30% charge.

Extensive transport laws are applicable to commercial shipments in order to ensure the safety of all parties involved in the transport chain. Additional dangerous goods laws must be followed if defective or damaged lithium batteries are transported. You can find a comprehensive list of laws and regulations from ADR, IATA (the International Air Transport Association) as well as UN regulations.

According to international transport legislation, lithium-ion batteries with an energy density of more than 100 Wh are considered Class 9 dangerous goods. On the various transportation routes, the following rules come into effect:

Please note: The regulations mentioned above represent only a selection of the most important legal requirements. Please refer to the listed organisations and directives for more detailed information. If in any doubt, consult experts or contact the relevant regulatory authorities.

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