



SAFETY FIRST: A BETTER WAY TO TRANSPORT LITHIUM-ION BATTERIES

The Risks Associated with Lithium-Ion Batteries:

Lithium-ion batteries are inexpensive and lightweight, making them a popular power source for most personal electronic devices on the market today. However, in recent years, the risk of catastrophic fire and explosion caused by lithium-ion batteries has gained international media attention. The International Civil Aviation Organization (ICAO) has warned against these dangers, and as a result of their recommendations, countless airlines have banned the transport of lithium-ion batteries aboard passenger planes.

Lithium-ion batteries are both explosive and toxic. They pose a significant risk to pilots, passengers, and aircraft and ground crews. Lithium-ion batteries can self-ignite for three reasons:

- 1) An uncontrollable increase in temperature, called Thermal Runaway, can occur during the battery's charging process when the battery's safeguards fail to stop a fully charged battery from continuing to charge.
- 2) If the temperature of the environment exceeds 170°F (77°C), it can cause a battery to ignite. This type of fire starts subtly, but as the gasses build up within the battery, it will eventually cause an explosion.
- 3) If the battery's chemicals are directly exposed to oxygen or water, rapid oxidation can occur. This happens when a battery is punctured, commonly during transport, and its contents are exposed.

It is easy to see how high temperatures or a punctured battery could occur during transport, quickly leading to a disastrous situation. In recent years, there have been several notable catastrophes caused by lithium-ion battery fires. In 2010, a UPS plane crashed in Dubai, killing both crew members aboard. Crash investigators later determined that the plane was brought down by a fire caused by a pallet of lithium-ion batteries. In 2011, a fire brought down Asiana Airlines Flight 991 into the Korea Strait, killing both crew members aboard. The fire started on or near pallets containing dangerous goods, which included lithium-ion batteries. There is also some skepticism that the 2014 disappearance of Malaysian Airlines Flight MH370 may have been caused by a pallet of lithium-ion batteries in the cargo hold, though this theory has not been proven.

Still, cargo planes are shipping millions of lithium-ion batteries across the world each year. About 95% of lithium-ion batteries are manufactured in China and then distributed globally. Many of the current safety measures used by transportation companies are ineffective or even harmful, potentially contributing fuel to a fire.

The Solution - Modern Fire Containment Covers:

Since 2007, Newtex has been working to develop fire containment solutions for this application. Our highly effective and cost-efficient solutions will benefit air and sea cargo transport companies, lithium-ion battery manufacturers, and ground support crews.

The FireCape™ Fire Containment Cover (FCC) encompasses a load to contain ignition to a single pallet for at least 6 hours, allowing a pilot sufficient time to land an aircraft if smoke is detected. The device is made from Z-Block™ fire and smoke resistant materials which withstand temperatures up to 1800°F (980°C) and exceed performance standards set by the Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA), and leading cargo carriers.

In order to meet the needs of cargo carriers and ground crews, our FCC is lightweight, durable, and easy to deploy. It also features crucial venting technology to ensure that complete combustion can occur, which has proven safer and more effective than trying to suffocate a lithium-ion battery fire.

In addition to fire containment covers, we have also done extensive testing on overpacks and box liners made from Z-Block™ materials. These products are designed to contain each box within a pallet individually to even further decrease the chances of a fire spreading.

The Z-Block™ coating and substrate fabrics were originally designed to channel smoke and prevent the spread of fire in hangars, theaters, and large public gathering spaces. When it became clear that Z-Block also had the potential to provide lifesaving protection aboard aircrafts, the engineers at Newtex collaborated with aviation experts, airline safety officials, and major shipping companies to optimize Z-Block™ for use in fire containment covers.

To learn more about Newtex's fire containment solutions, please visit: www.newtex.com/fire-containment