

Aircare Firesock® (FS-010) Recommended Procedures for a Suspect Electronic Device (SED)

Appliances such as laptops, cell phones and other personal electronic devices, powered by lithium batteries, pose a threat while in flight. These batteries have been known to unexpectedly enter a state of thermal runaway, which is a condition caused by defects within the cells of Lithium-Ion battery packs. The chemical reaction that causes thermal runaway results in a rapid temperature increase that can reach over 2000° Fahrenheit; often causing the adjacent cells to also enter a state of thermal runaway. The result is extreme heat, a series of small violent explosions, off-gassing of Hydrogen along with other gases, flying debris, and ignition of the surrounding structure and nearby materials.

The FAA has done research and testing of Lithium battery fires, and has issued a SAFO (SAFO 09013) that recommends procedures for dealing with lithium battery fires aboard an aircraft. Aircare FACTS® Training subscribes to this methodology. Aircare FACTS Training teaches these procedures during our crewmember emergency procedures courses for business aviation flight departments. The Aircare Firesock was designed to work in conjunction with these procedures and training. It is NOT a substitute for the FAA guidance.

The following procedures are suggestions and recommendations. Each flight department is responsible for establishing their own policies and procedures on how to deal with Lithium-Ion Batteries on board, and reactions to suspect devices or Lithium-Ion battery fires.

When Thermal Runaway Occurs

Aircare FACTS Training recommends that when a suspect device goes into thermal runaway, the crew and passengers do their very best to stop the thermal runaway immediately. We recommend following the procedures for a Lithium battery Fire. The quicker thermal runaway ceases, the less chance of bodily injury, secondary fires and cabin smoke.

It's important to understand that the Aircare Firesock does NOT stop thermal runaway, nor does it "smother" the fire. The Firesock is a containment device that contains heat, debris, and reduces the likelihood of secondary proximity fires. Smoke will emit from the Firesock if the device goes into thermal runaway.

Thermal runaway can occur in a Lithium battery-powered device at any time whether or not it is in use, powered on, or plugged in. An easily recognizable scenario is a laptop out in the open in a cabin that starts to smoke. This issue is much easier to deal with than a laptop that is buried in a luggage compartment, then enters advanced thermal runaway. The Aircare Firesock is specifically designed to contain the dangerous chemical and molten emission from a device that is in thermal runaway.



Suspect Electronic Device

When a device is suspect, getting hot, and is believed to be in danger of entering thermal runaway battery fire risks can be mitigated by immediately placing the device in the AirCare Firesock. This needs to be done prior to outward signs of smoke and fire. The most common outward sign that a suspect electronic device is preparing to enter thermal runaway, is excessive heat coming from the battery pack. The battery may also bulge or ooze. This is a clear sign of a device rapidly entering full thermal runaway, complete with visible smoke, fire and explosion potential. If there is visible smoke and/or fire, do not touch the device and use the procedures for a Lithium Battery Fire. If the device has not entered thermal runaway, you can consider the use of the AirCare Firesock as a strong risk mitigation for further risk or injury caused by a thermal runaway.

Recommended procedures for Suspect Electronic Device and use of the AirCare Firesock:

Please note that these procedures do not replace or should not alter a crews' decision or individual flight department protocols for emergency situations or landings.

1. Identify the suspect electronic device. Communicate with the flight deck. If there is any visible smoke or fire, follow the recommended procedures for a Lithium Battery Fire. If the device is not exhibiting signs of a Lithium battery fire, proceed to step 2.
2. Relocate PAX away from area.
3. Retrieve the AirCare Firesock, open the tube and empty the contents.
4. Don the protective gloves.
5. Carefully and quickly put the device into the Firesock by unfolding the shiny silver heat shield flap and placing the device inside the Firesock, between the silver thermal protective layers.
6. Fold the large flap INSIDE the bag until it stops.
7. Press down to seal the internal Velcro flap.
8. Fold over and seal the external Velcro flap, locking the device inside.
9. While wearing the protective gloves, use the handle to place the AirCare Firesock in a non-flammable area such as a sink, oven, microwave or metal bin. If possible, consider likely smoke emission caused by thermal runaway within the Firesock to minimize risks to passengers and crew onboard.
10. Continue to monitor the device. Do not open the bag.
11. Upon landing, have the bag checked by fire department personnel.