

## Aircare FireSock® Recommended Procedures

Appliances such as laptops, cell phones and other personal electronic devices that are powered by lithium batteries pose a threat because these batteries have been known to unexpectedly enter a state of thermal runaway. Thermal runaway is caused by a defect in the one of the cells within the battery pack. This chemical reaction causes the cell to escalate in temperature often causing the adjacent cells to also enter this state. The result is extreme heat, a series of small violent explosions causing out-gassing and flying debris, and smoke and fire of the surrounding packaging and nearby materials.

The FAA has done extensive 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 and teaches these procedures during our crew member 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 these procedures.

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 battery fires aboard their aircraft and are responsible for the outcome.

### **Transport**

Thermal runaway can occur in an Lithium battery-powered appliance at anytime whether or not the device is in use, powered on, or plugged in. There are documented incidents and fatal aviation accidents that have occurred from lithium battery fires that originated in the cargo hold that were not in use or connected to a power source. For this reason we recommend that when an appliance is not in use that it is stored in the Aircare FireSock. Especially if the appliance will be unused for the duration of the flight and stowed in the cargo area unseen. This way, should thermal runaway occur, the fire and small explosions are contained only to that area. This greatly reduces the risk of an unprotected device.

A best case scenario is a laptop out in the open in a cabin that starts to smoke. This issue is much easier to deal with than, say, a laptop that is buried in a luggage compartment, uncontained, and goes into advanced thermal runaway and ultimately fire. The Aircare FireSock addresses this concern.

### **Damaged Portable Electronic Devices (PEDs)**

There are a variety of ways that PEDs can be damaged in the cabin including dropping, mishandling, electro-mechanical seats etc. Just because a PED is damaged doesn't always mean it will go into thermal runaway, but it does become a hazardous material and should be treated as such.



The FireSock can be used to place damaged PEDs into for the duration of the flight should they become damaged.

If the device is suspected of going into thermal runaway, the procedures should be followed first before putting it into the FireSock.

### **When Thermal Runaway Occurs**

Aircare FACTS® Training recommends that when an appliance has a battery that goes into thermal runaway, the crew and passengers do their very best to stop the thermal runaway immediately. The quicker thermal runaway has ceased the less chance of bodily injury, secondary fires and most importantly 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 fires caused by proximity.

### **Recommended procedures for Lithium Battery Fires and use of the Aircare FireSock:**

Please note that these procedures do not include the crews' decision or the flight departments protocols for emergency landings.

1. Recognize the beginning of thermal runaway. Communicate the emergency to the flight deck.
2. Relocate PAX away from area.

**DO NOT ATTEMPT TO MOVE THE OVERHEATED DEVICE!**

3. Don Smoke hood or PBE if available to protect eyes and face
4. If flame is visible, use Halon or Water fire extinguisher to knock down fire.
5. If possible, unplug the device or shut off the breaker.
6. Don gloves located in FireSock Container. Empty the container of contents.
7. After flame/fire is extinguished, use water, Firebane or any other non flammable liquid to douse the appliance to cool the batteries. The FireSock container tube can be filled with water and used for dousing.
8. Continue dousing the appliance until you are relatively certain thermal runaway has ceased. Wait at least 10-15 minutes to ensure thermal runaway has ceased.
9. Carefully and quickly put appliance into the FireSock. Seal the velcro and use handle to move appliance to a secure non-flammable surface (sink, oven, microwave, metal bin).
10. Continue to monitor device.