

Fire Risk Mitigation and Response in Residential Settings using Freedom Won Batteries

Freedom Won batteries are assembled with Lithium Iron Phosphate (LiFePO₄) cells, which are very safe and are not prone to thermal runaway or combustion that releases extreme heat. It is however prudent to be prepared for a fire event no matter how small the probability of occurrence.

Preventing or fighting a fire involving a LiFePO₄ battery in a residential setting requires a specific protocol to ensure the safety of the occupants and protection of property. The following is a fire risk mitigation guide for preparedness and response to a potential fire incident involving a Freedom Won residential battery, as recommended by Freedom Won.

Note that this guide may not apply exactly to other brands or types of lithium batteries.

1. Prevention and Preparedness

- a) **Proper Installation:** Ensure that the battery is installed and operated according to Freedom Won guidelines and local building/installation codes.
- b) **Smoke Detectors:** Install smoke detectors in the area where the battery is installed – early detection is key. A fire in a LiFePO₄ battery could be preceded by a period of gassing. Detecting this gas in the battery room early may allow a responder to prevent a fire from developing. Ensure regularly that the detection and alarm notification system is working correctly, and fresh batteries are installed.
- c) **Fire Blanket:** Keep a fire blanket of adequate size in the vicinity of the battery. Fire blankets can be useful for:
 - i) preventing a fire from developing when there is still only gassing and smoke emanating from the battery,
 - ii) for smothering a moderate battery fire once established, and
 - iii) for preventing a fire from spreading.
- d) **Fire Extinguishers:** Keep Class D fire extinguishers on hand, suitable for lithium fires. Class D fire extinguishers use dry powder to extinguish metal fires, including lithium.
- e) **Water Dousing:** If a fire cannot be controlled with a fire blanket or a fire extinguisher, water dousing may be the final option, keep a garden hose with sufficient reach and water pressure to douse a battery fire.
- f) **Emergency Contacts:** Have a list of emergency contacts and numbers readily available, including local fire department, and Freedom Won customer support.

2. Identifying the Fire

- a) If it is safe to do so, try to identify the source of the smoke/gas or fire. Ensure that it is indeed the battery that is producing the smoke or gas or on fire, and not any other nearby combustibles or equipment.
- b) If you notice signs of smoke/gas coming from the battery or a fire in the battery, call the emergency services while you continue with the first response steps below.

3. Evacuation

- The safety of the occupants is the top priority. If the fire is spreading rapidly or if you are unsure about your ability to extinguish it safely, evacuate all occupants from the residence to a safe location and call your emergency services.

4. Isolation and Shutdown

- If it is safe to approach the battery, switch off the breaker on the battery itself if it is not already off.
- Switch off the grid power to the system at the outside breaker feeding the property or another supply point that is safe to access.
- Switch off the inverter(s) and all other DC or AC main breakers.
- If it is safe to approach the battery, disconnect it from the inverter or DC bus by removing or cutting the DC battery cables.



5. Fire Extinguishment or Early Prevention

- If the battery is only releasing fumes and there are no open flames, use a fire blanket to smother the battery to prevent a fire from starting. The blanket will prevent new oxygen from entering the battery, which may prevent flames from occurring. Ensure that the blanket covers the battery completely.
- If moderate flames are already visible and the flames are not preventing close access to the battery, quickly cover the battery with the fire blanket.
- Observe the battery closely from a safe distance without inhaling excess fumes. If the fire remains subdued, await the arrival of emergency services to safely remove the battery from the premises.
- If the fire persists or you do not have a fire blanket, but you have a Class D fire extinguisher and are trained to use it, attempt to extinguish the fire. Stand at a safe distance and direct the extinguisher towards the base of the fire.
- If the fire continues to burn or spread, douse the battery with a water hose from a safe distance.
- If this is not possible, evacuate the area and await the arrival of the fire department.



6. Battery Removal

- If the fire is under control with the fire blanket and there are no open flames, and it is safe to do so, attempt to remove the battery from the building to an open, well-ventilated area with no combustibles nearby. Keep the battery covered with the fire blanket.
- Ensure that you wear appropriate personal protective equipment (PPE) while handling the battery, including gloves and eye protection. Do not inhale excessive amounts of gasses or fumes that may be released by the battery.
- Continue to monitor the battery for any signs of re-ignition.

7. Post-Fire Response

- a) After the fire is extinguished, allow the battery to cool down. Do not attempt to handle the battery until it has cooled.
- b) Contact Freedom Won or a professional to assess the damage and ensure the battery is safe.

8. Follow-up

- a) Review the incident with local authorities, the fire department, and Freedom Won to understand the cause of the fire and take preventive measures.

Remember that safety is the top priority in any fire situation. If there is any doubt as to the ability to take any first response steps against the fire safely, evacuate and call for professional assistance.