







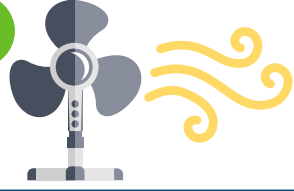

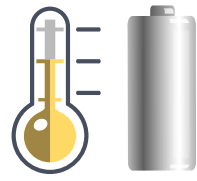
## HOW TO EXTINGUISH LITHIUM-ION BATTERY FIRES

Lithium-ion battery fires have unique threats, which include reignition and explosion, if they are not extinguished properly. Hazardous energy may still exist even after the battery or device is shut down.









### Electrolyte Spills

-  **Identify chemistry** involved to know the response.
-  Reference any **pre-plan info** if available.
-  Interview any **knowledgeable staff**.
-  **PPE** and **SCBA** offer limited protection.
-  **Dike area around spread** – clean up needs to be completed by **qualified personnel**.

### Overheated Batteries

-  Overheating can be evident by **bulging** or other deformities.
-  **Air monitoring** and **ventilation** should be ongoing.
-  If you can see the battery, monitor them with a **thermal imager** for **changes to temperature**.
-  When batteries are shut off, **they should cool**, but it may take time. If temperatures do not go down or go up, there **may be a fire**.

### Battery / Energy Storage System Fires

-  Ensure full **PPE** and **SCBA** are being used in firefighting operations.
-  Review **safety data sheets** or **pre-plans** to know battery chemistry and hazards.
-  Secure the **water supply**.
-  **Evacuate** the area affected by fire.
-  Consider **turning off HVAC** but keep dedicated exhaust for energy storage systems.
-  Attempt to **extinguish the fire**. Apply water directly to cells, if possible, to remove heat. If direct water application isn't possible, apply water to protect exposures.
-  After the fire, **monitor for flammable or toxic gases**. Always monitor for pockets of stranded gas. Never attempt to overhaul a damaged energy storage system.
-  **Continue temperature monitoring**. It may take hours or days to cool. Continue monitoring for explosive and toxic off-gassing and reignition, if possible.