2023 FIREFIGHTER SAFETY STAND DOWN

June 19, 2023

Recognition of Hazards

As consumers continue expanding use of batteries, we must continue to modify our tactics to properly respond and protect firefighters. Fighting vehicle and home fires is inherently dangerous but now a new technology changes the risk profile. When responding to an incident involving a lithium-ion battery system fire there are additional challenges responding crews must consider.

WHY ARE LITHIUM-ION BATTERIES HAZARDOUS? When a battery is damaged to a certain extent it can go into thermal runaway, potentially causing a fire or explosion that is very difficult to control or extinguish. Once extinguished, the battery cells still present a standard energy hazard which can cause a dangerous shock or even reignite the fire. The Science of Lithium-ion batteries

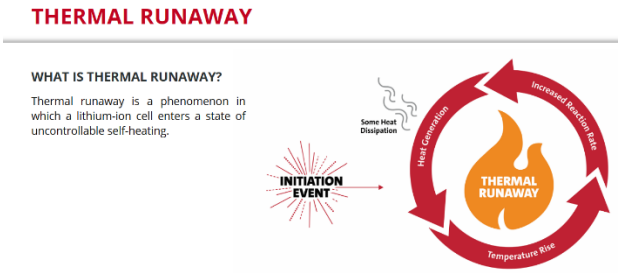
Battery-powered electric micro mobility devices, including the e-bikes and e-scooters that have become immensely popular in recent years, do catch fire. Specifically, it's their batteries that pose a risk. In New York City alone, fire department officials say these devices sparked more than 130 fires so far in 2022, putting the city on pace for more than 160 e-bike or e-scooter fires this year. That would be a roughly 50 percent increase over the 104 blazes the New York City Fire Department (FDNY) reported in 2021, which killed four people. Five people have died in such fires in 2022, including a 5-year-old girl who died in an August 3 blaze sparked by a charging e-scooter.

E-Bikes and E-Scooters

E-Bike ignites

WHAT IS THERMAL RUNAWAY? Thermal runaway refers to the uncontrollable chain reaction that occurs when a battery cell has an internal short circuit. This short circuit generates heat, and transfers that heat to neighboring battery cells, causing them to generate their own heat and continue to other battery cells in a cascading event. This heat generation also converts the internal components of the battery cell into a flammable and toxic gas. This gas will pressurize the cell and eventually burst out, usually causing a distinctive popping sound. Once the flammable and toxic gas mixture finds an ignition source, a battery fire or explosion can occur.

Thermal Runaway Video



WHAT IS STRANDED ENERGY? Standard energy refers to the fact that it is difficult to discharge the electrical potential energy from a battery cell after it has been damaged. You cannot simply unplug a battery to de-energize it. This electrical potential energy that is trapped in a damaged battery can be a shock hazard to firefighters as they are conducting overhaul and a reignition hazard as batteries are known to reignite several hours or even weeks after the fire is thought to be fully extinguished. It is important to use nonconductive equipment when performing overhaul in a fire that might involve lithium-ion batteries. It is also essential to continue to don SCBA when around damaged lithium-ion batteries as reignition could occur and discharge toxic and flammable gases.

Stranded Energy Video