Lithium-ion and EV Safety Concerns and Best Practices

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Key Points

- Li battery fires in CO and causes
- Safety on handling and storing batteries to prevent fires
- Best things to know if there is a fire at a facility, tips on do's and don'ts
- Best way to educate consumers to prevent these types of fires
- How can HHWs and fire departments collaborate to encourage community engagement?

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Hazards

1. Lead Acid and Lithium-ion batteries generate very toxic vapors. Inhalation of these gases can be deadly. Both types of batteries can present an electric shock hazard.

2. Damaged Lithium-ion batteries can emit flammable and explosive gases in addition to toxic vapors.

3. Lithium-ion batteries are nearly impossible to extinguish due to their design and packaging. Properly disposing of such devices is extremely difficult.

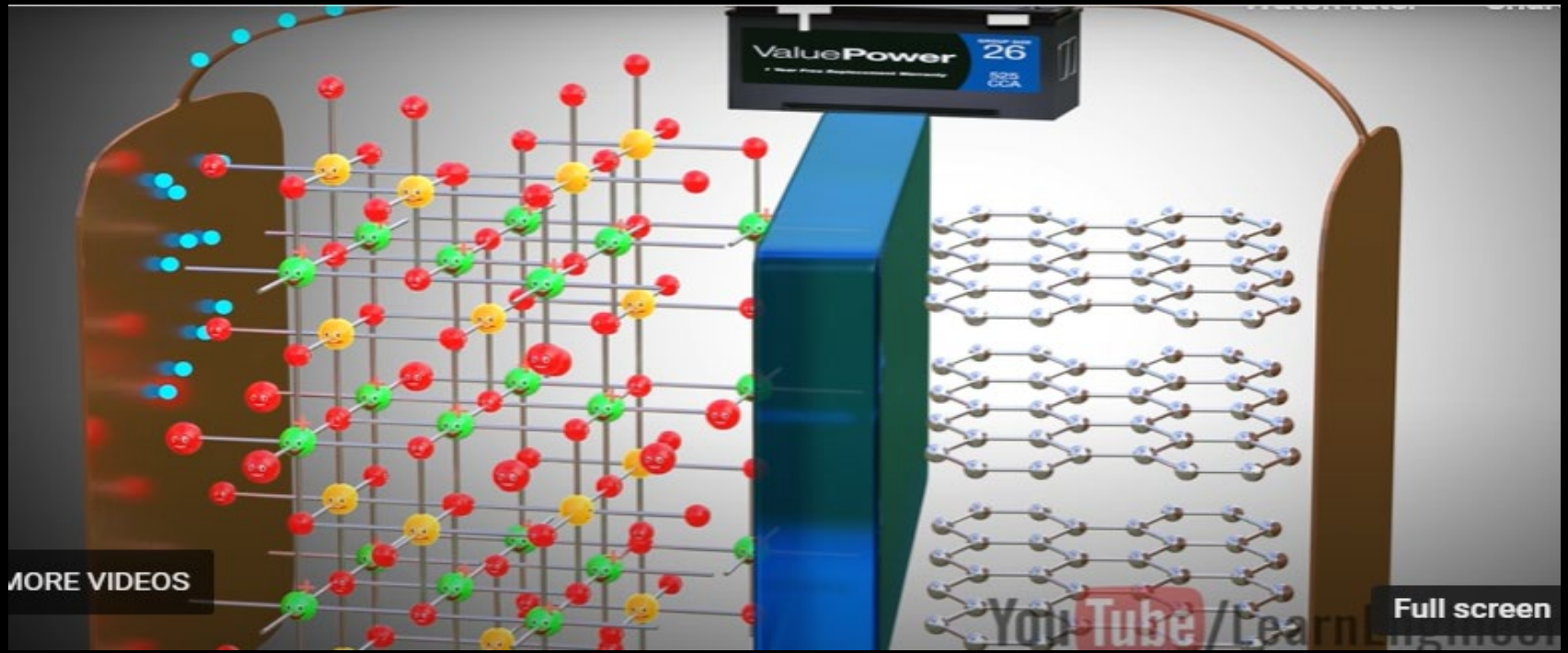
Li Battery Myths

All of the following statements are FALSE!!

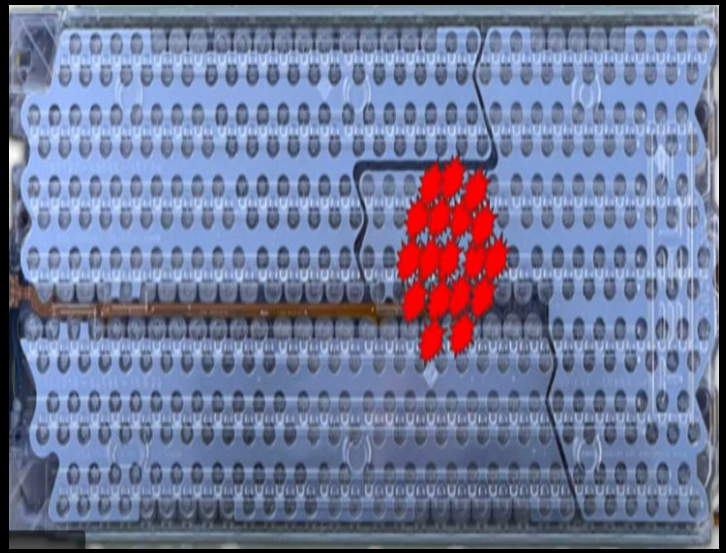
- Submerging Lithium-ion batteries will extinguish the fire.
- Lithium-ion batteries have been rendered safe and won't reignite once properly cooled using copious amounts of water.
- Sand and dirt can extinguish Lithium-ion battery fires.
- Cutting away the unaffected battery terminals can avoid a thermal runaway.
- Lithium-ion powered devices are only dangerous when they are actively on fire.

How bad can it be??

How do these batteries work?



What is Thermal Runaway?



Here's what we're facing…

What Else Can go Wrong?

- Electric Shock
- Toxic Smoke and Gas (HF)
- Fires Spread Rapidly
- Can’t extinguish fire with water

How to recognize a problem

- Batteries that are overcharged, overheated, damaged, or on fire may present hazards.
- The presence of hotter than normal batteries and/or signs of warping is an early sign of battery damage. You can use a temp guns to measure battery temperatures.
- Batteries should never be hot to the touch
- Off gassing leads to thermal runaway in most cases unless power is removed during charging.

How to prevent a fire

- Avoid charging batteries while you're asleep or not present.
- Only use batteries and chargers that are UL listed.
- Make sure to only use chargers and batteries that come directly from the manufacturer
- Avoid cheaper "knock off brands" made outside of the US and follow all manufacturer recommendations.
- Do not store or charge mobility devices inside living areas.
- Off gassing leads to thermal runaway in most cases unless power is removed during charging.
- If a battery becomes overly hot, warps, or fails to keep a charge it is best to dispose of the battery rather than reusing.

Hazards to First Responders/ and the Public

- Explosions/Fires that do go out
- Hazmat (Life and Property)
- Electrical Shock during Extrication
- Extremely rapid evolving fire behavior that can quickly consume structures.

Best Practices

- Monitor batteries for excessive heat while operating and while charging (temp guns can be very helpful).
- Charge and store away from combustible materials when possible.
- Don’t try to extinguish battery fires.
- Dispose of batteries that become damaged.
- Do not discard batteries in the trash. Either take them to a recycler or contact the county to have a special track pick up scheduled.
- Cell Block and Overpack for bulk use facilities

New Equipment Available

Collaboration and Information Sharing

Lithium-ion Batteries

Safety Tips

Lithium ion batteries are used to power many kinds of devices, including smart phones, laptops, e-scooters, e-bikes and toys.

Lithium ion batteries store a large amount of energy in a small amount of space, they can pose potential fire safety hazards if not used properly.

Improper charging and physical mistreatment are some of the primary factors that can cause these batteries to explode and catch fire quickly.

Be Safety smart if using any devices powered by lithium-ion batteries

- Purchase and use devices that are listed by a qualified testing laboratory such as UL / ULC.
- Follow the manufacturer's instructions for charging and storage of devices.
- Only use batteries and charging cords that are designed and approved by the manufacturer for the device.
- Do not charge a device under your pillow, on your bed or on a couch.
- Avoid overcharging devices – unplug when the device reaches 100 percent.
- Do not place batteries in direct sunlight or hot vehicles.
- Store lithium ion batteries away from anything that can catch fire.
- Avoid crushing, bending or dropping a device or charger.
- Stop using the battery if you notice any of the following: odour, change in colour, change in shape, too much heat, leaking, or noise coming from the battery. Follow your home escape plan and call **9-1-1** once safely outside.

CAUTION

Refer Instruction Manual Booklet

Battery disposal

- Batteries are household hazardous waste.
- Do not place batteries in a Garbage Bin, Blue Bin or Green Bin.
- Place batteries in a clear plastic bag or seal the terminals with non-conductive tape (e.g. clear packing, or electrical).
- Take batteries to one of the City's Drop-Off Depots, use the QR code below to find your nearest location.

Scan me

- Make safety information readily available on the job
- Conduct workplace safety audits
- Work with your Fire Marshal's Office
- Collaborate with PIO (Public Information Officer)
- Look into storage and container options
- Reach out to your county for disposal options

Questions?

Please feel free to contact me if you have any questions.

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