# Hydrogel Extinguishing Instructions for Li-ion battery fires

In our increasingly mobile and tech-driven world, Li-Ion battery packs power everything from smartphones to electric vehicles. However, they also pose a serious risk of fire if damaged, overloaded, or mishandled.

A Li-Ion battery pack consists of multiple small cells encased in either plastic and/or metal. The danger often begins with just one defective cell. As the temperature within the defective cell escalates rapidly, it triggers the formation of flammable gases. This phenomenon is known as "thermal runaway." These gases build up pressure until the battery casing can no longer contain them, leading to a catastrophic rupture. Once the gases erupt, the affected cell sustains internal damage, creating conditions ripe for a short circuit—this is where things take a dangerous turn. A spark ignites an explosive fire that can quickly escalate beyond control. The intense heat generated by this initial blaze can initiate a chain reaction among neighboring cells, resulting in massive fires that are notoriously difficult to extinguish.

Anogas has pioneered the development of Hydrogel, a groundbreaking solution designed specifically for combating lithium-ion fires. This innovative and environmentally friendly product has demonstrated remarkable effectiveness in rigorous testing scenarios involving lithium-ion battery fires. What sets our Hydrogel apart? Its unique formulation delivers intensive and long-lasting cooling for Li-Ion battery cells, effectively forming an oxygen barrier that smothers flames while chemically immobilizing reactive lithium. Imagine a firefighting solution that not only extinguishes fires but also protects the environment—this is the future of fire safety.

With portable Hydrogel extinguishers, you can safely combat flames from over 3 meters away. These extinguishers are also safe for use on electrical equipment up to 1000 volts.

For optimal results when using Hydrogel:
- For smaller batteries (smartphones, laptops, cameras), we recommend at least 2 liters.
- For larger battery packs (such as bicycle batteries or power tools), a minimum of 6 liters is advised.

When dealing with industrial Li-Ion batteries—like those used in forklift trucks—the situation becomes more complex. These hefty units are often encased in robust metal housings that can hinder the extinguishing agent's ability to reach the source of the fire. In such instances, it's essential to alert the fire brigade immediately. Utilizing larger quantities of Hydrogel—such as 25 or 50 liters from a trolley, or even 300 to 1000 liters via an industrial Compressed Air System—can help control or even extinguish the blaze from a safe distance until professional assistance arrives.

## Safety First!

When attempting to extinguish a lithium-ion fire, wearing a gas mask is crucial to protect against toxic fumes—maintain a safe distance throughout the process. The Hydrogel thickens upon exposure to high temperatures and adheres firmly to hot surfaces—this ensures localized cooling where it's needed most. Apply it in intervals to maintain an effective cooling layer without displacing it prematurely. The presence of Hydrogel on top of the burning batteries will help to eliminate the toxic gasses, however a full elimination cannot be guaranteed. Therefore, always stay at a safe distance.

Once flames are under control, it's essential to cool down the interior of the ignited battery thoroughly to prevent reignition or further thermal runaway incidents among nearby batteries. Direct your extinguishing beam toward areas where flames and gases were previously visible while keeping a safe distance. The cooling effect of Hydrogel not only mitigates heat but also inhibits chemical reactions within the battery cells. Continue spraying until you no longer hear the "sizzling" sound of escaping gases—this is your signal that it's safe to proceed.

To maximize effectiveness during application, spray Hydrogel at intervals rather than all at once. This technique minimizes disruption to any cooling layers already established.

After addressing the immediate danger, monitor the extinguished battery closely for at least 20 minutes. This initial observation period is critical in identifying any potential re-ignition or residual hazards. Once you have confirmed that the battery is stable and safe, carefully transfer any burned batteries into a water-filled container placed outdoors or in an open area away from flammable materials. It's essential to allow these batteries to cool for at least 48 hours before proceeding with disposal through standard hazardous waste channels.

Cleaning up after using Hydrogel is straightforward; simply absorb excess gel with towels or cleaning cloths before rinsing with plenty of water.

In conclusion, being prepared for emergencies involving Li-Ion batteries can save lives and property. Equip yourself with knowledge about effective extinguishing methods like Hydrogel and stay vigilant about safety practices. For further information on fire safety measures or training sessions on handling battery emergencies safely, don't hesitate to reach out! Your proactive approach could make all the difference in ensuring safety for yourself and others around you!