



**FirePro.**

# Lithium-Ion Batteries

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Fire Protection Systems

LI-ION BATTERY

**ENERGY**

STORAGE



Reinventing  
**Fire Suppression**

# FirePro.



## Li-Ion Battery Safety

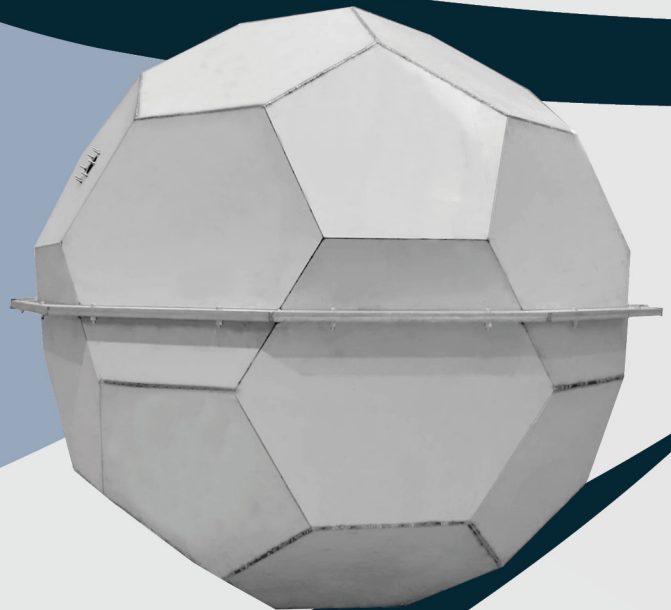
Li-Ion battery technology, despite being constantly improved, still poses a significant fire hazard.

A mechanical shock or other misuse of the battery may lead to an increase in its internal temperature, triggering a thermal runaway in the affected cells

## R&D

FirePro is at the forefront of research aimed at understanding the diverse fire behaviour of such batteries.

Our technology has been tested in several Li-Ion battery fire scenarios by accredited laboratories and Li-Ion battery manufacturers, demonstrating its effectiveness as a final layer of protection against the worst-case scenarios.



# How FirePro Works

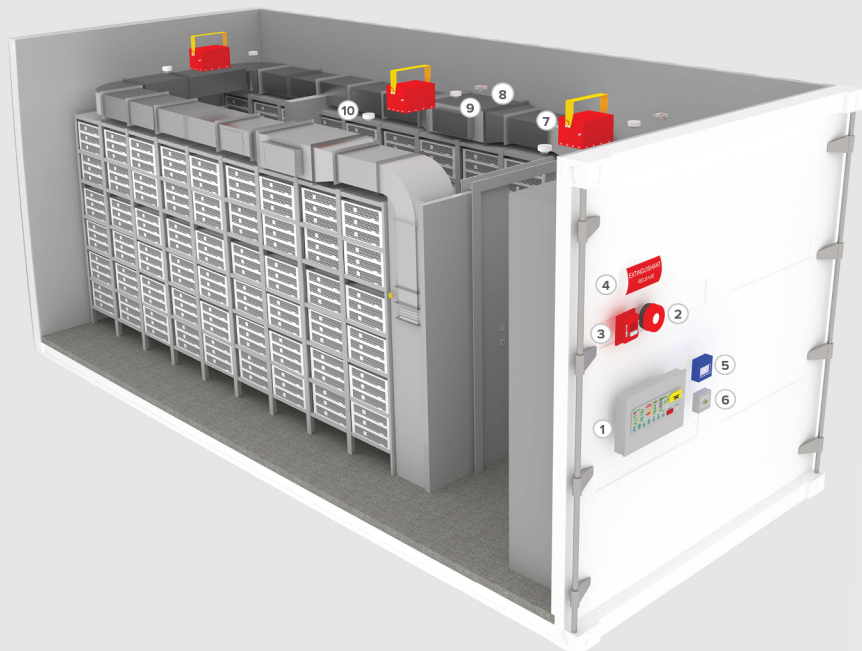


In the event of a Li-Ion battery fire, the FirePro active agent consisting of potassium salts ( $K_2CO_3$ ) neutralizes the electrolyte's decomposition products, such as Hydrogen Fluoride (HF), forming stable products (KF, 2KHF). Thus, preventing the formation of highly flammable gases such as Hydrogen ( $H_2$ ).

The resulting neutralizing action ultimately controls the fire and allows the temperature in the enclosure to drop below the threshold necessary for the thermal runaway to sustain itself.

## ESS System Design

- 1 Fire Alarm and Extinguishing Panel
  - 2 1<sup>st</sup> Stage Sounder (Bell)
  - 3 2<sup>nd</sup> Stage Sounder/Beacon (Horn/Strobe)
  - 4 Gas Release Sign
  - 5 System Isolation Switch
  - 6 Emergency Hold Device
  - 7 FirePro Condensed Aerosol Generators
  - 8 Sequential Activator
  - 9 Smoke Detector
  - 10 Heat Detector (RoR)
- and/or  
-Aspirating Smoke Detection  
-Linear Heat Detection  
-Flame Detection

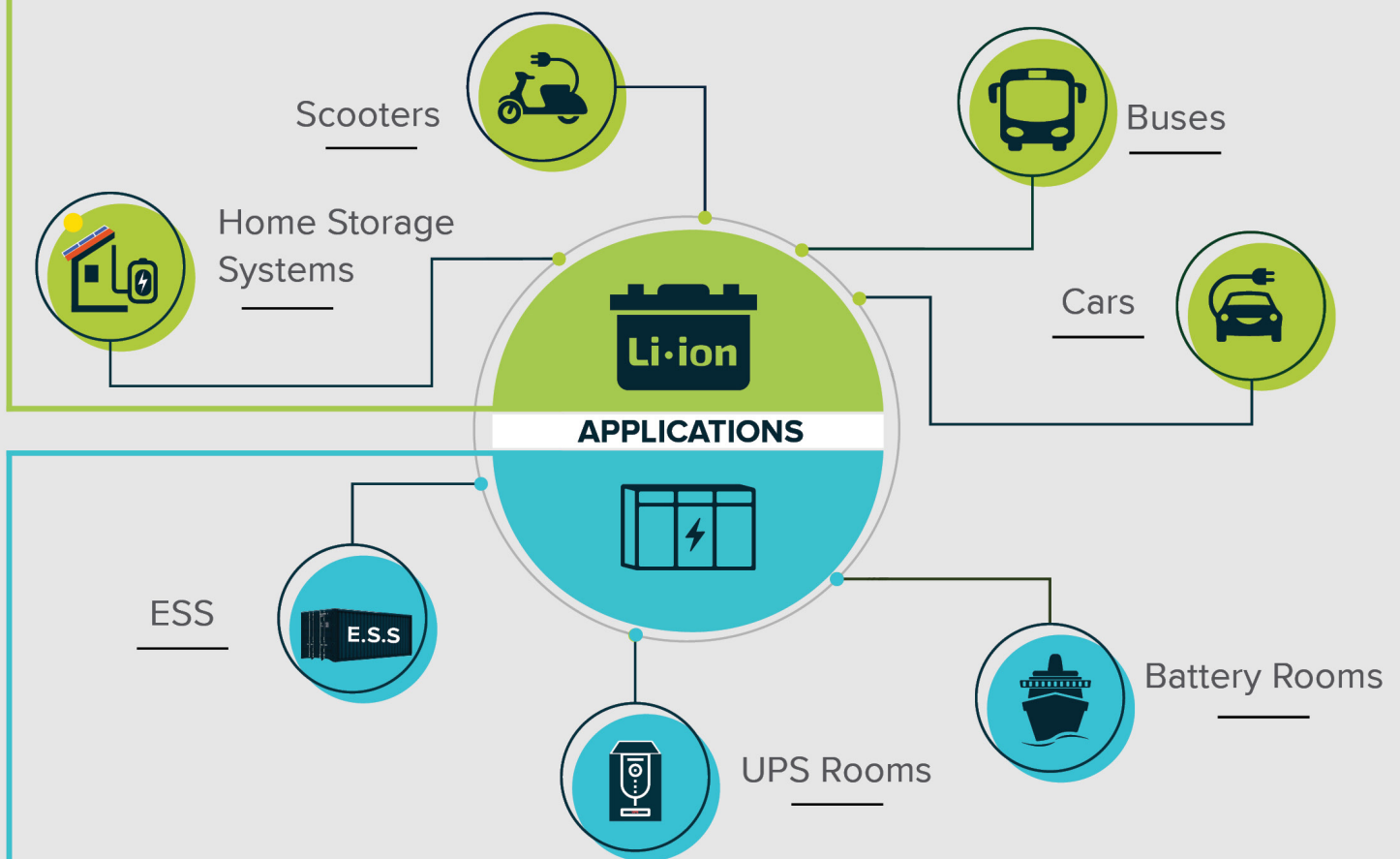


# Applications

## Battery Pack Protection

FirePro cylindrical models are compact and provide a practical solution for applications with space limitations such as home battery-storage systems and electric vehicles.

These generator models are placed within the battery pack and are activated automatically either through electrical or mechanical means.



## Energy Storage System Protection

Battery Energy Storage Systems (ESS), usually placed in containers, are protected using the total flooding concept.

The fire suppression agent concentration required for larger volumes such as these, is achieved through the use of our pre-engineered box-type models.

# The Technology

## Certifications



Test reports on FirePro's suitability to suppress Li-Ion battery fires are available upon request.

## FirePro Advantages

- Space & weight savings
- 15-year product life
- Easy installation in new or retrofit projects
- Can tolerate small openings
- Easy to transport
- No piping or nozzles required
- Non-pressurized
- Operating temperatures: -50°C to +100°C
- Non-Oxygen Depleting

**HFC FREE** HFC-free

**CFC FREE** CFC-free

 Zero Global Warming Potential

**EPA SNAP** ODS Listed Alternative

**O<sub>3</sub>** Zero Ozone Depletion Potential

**ISO** Manufactured under ISO 9001 ISO 14001

FirePro fire suppression systems are EPA SNAP listed for Normally Occupied Areas.

## Distribution Network

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Albania  
Austria  
Belgium  
Bulgaria  
Croatia  
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Czech Republic  
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Mauritius  
Morocco  
Nigeria  
South Africa  
Sudan  
Tanzania  
Tunisia

### LIMITATION OF LIABILITY

In no event, regardless of cause, FirePro Systems shall be liable for any indirect, special, incidental, punitive or consequential damages of any kind, whether arising under breach of contract, tort (including negligence), strict liability or otherwise, even if advised of the possibility of such damages.

**FirePro.**

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**[www.firepro.com](http://www.firepro.com)**

