



LITHIUM SAFETY STORAGE CONTAINER

CONTAINER

Introduction

Lithium batteries are a new type of fire hazard

- ✓ Lithium batteries are the battery technology of choice in a wide range of applications including power generation, communications, industry, vehicles and vessels. Lithium batteries are composed of high-energy materials with often flammable electrolytes and this represents a significant fire hazard.
- ✓ Any damage to a separator in the lithium battery, caused by mechanical damage or high temperatures, can lead to an internal short circuit with a high probability of a thermal runaway.
- ✓ Once a cell enters a thermal runaway, it is very likely that the heat will spread to adjacent battery cells leading to a chain reaction with often serious consequences. The increasing number of lithium batteries in various energy storage applications represent a new type of fire hazard where fire protection is a challenge. Active control of the lithium battery does not provide a sufficient guarantee and at present there is no proven technology for stopping a thermal runaway in a lithium battery cell.
- ✓ The main issues with lithium batteries are that they generate their own oxygen and, combined with water, produce a highly explosive and harmful gas: hydrogen fluoride (HF), which poses a major health risk to people and environment. Therefore, conventional extinguishing agents are not suitable for adequately extinguishing a lithium fire.



Introduction



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Lithium Safety Concept: 24/7 Connect & Control

- ✓ There are many technologies available for detecting and suppressing lithium battery fires in their various stages, but there is no fire protection concept that is equally suitable for all applications. To prevent safety-critical situations, multiple levels of defence are needed to minimize the severe consequences of lithium battery failure and thermal runaway.
- ✓ In our Lithium Safety Concept: 24/7 Safe & Connect & Control, your issue is central to which risk prevention, compartmentalization, early and accurate detection, fire safe packaging, innovative systems with real-time notifications and specialist follow up with our 24/7 Lithium Incident Control, play a key role.
- ✓ The goal is to provide action perspective to prevent an incident and keep it manageable, as well as to prevent an extinguishment and the negative impact of an incident on the employees, the company and the environment.
- ✓ Our total concept has been extensively tested and certified by KIWA Fire Safety and Security and is in line with the new legislation [PGS37] in the Netherlands.



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Lithium Safety Concept: 24/7 Connect & Control

1. Risk prevention

- ✓ Thorough tailor-made scenario research possible causes and consequences
- ✓ Awareness training personnel
- ✓ Fire safety devices

2. Early and accurate detection

- ✓ Real-time overview
- ✓ Automatic call forwarding
- ✓ Action perspective: procedures and protocols training

3. Pre-fire management

- ✓ Follow-up: organizational measures
- ✓ Specialist emergency service: 24/7 Lithium Incident Management
- ✓ Rapid and correct removal of the potential fire source

4. Suppression

- ✓ LiEFS iDetection Suppression Technology
- ✓ Effective way to stop an incipient lithium battery fire: minimum 90 minutes
- ✓ Certified by KIWA Fire Safety and Security

5. Cooling

- ✓ Avoid extinguishing with water as much as possible
- ✓ Cooling the lithium battery(s) that has caught fire under water or in sand
- ✓ Place the affected lithium battery(s) in a quarantine container

6. Post-fire management

- ✓ Cleaning and tidying up
- ✓ Disposal of lithium battery(s) in UN approved containers
- ✓ Inspection, reinstallation and evaluation

An effective preventive lithium battery fire suppression plan tailored to your needs!



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Lithium Safety check

The Lithium Safety Check gives you valuable insights into the risks present within your organization with lithium batteries.

Safety situation, risk level and solutions

- ✓ A survey and analyse of the current safety situation of the buildings and facilities, business and work processes - more specifically the storage, supply chain and return processes relating to lithium batteries of the customers.
- ✓ To determine the current security level and risks of the buildings and fixtures, the facilities and amenities, the processes, environment and safety of the employees in relation to lithium batteries.
- ✓ Based on the outcomes, jointly determine with the customer the desired safety level and risk and, together with our partners, offering various appropriate proven solutions and technologies.



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LiEFS® with iDetection and Suppression Technology

Safe, connect & control

- ✓ LiEFS® with iDetection and Suppression Technology is an integrated smart safety solution that has been proven to suppress a lithium fire in an early stage and consists of a combination of unique and ultra-fast intelligent detection of a starting lithium fire. The detection is based on smoke, temperature, and CO and this ensures correct and effective suppression of a lithium fire via the fire reporting system. At the same time, the fire alarm is real time automatically communicated to the fire department and any communication device.
- ✓ The suppressant in LiEFS® consists in solid matter of mainly potassium nitrate. After activation this solid matter is converted into an aerosol. This is a rapidly expanding dry aerosol that is applied into space and binds to the free radicals in the lithium fire. Aerosol ensures that the free radicals are stabilized into molecules. This interrupts the chain reaction of the fire, and the flames are extinguished within seconds. By removing the flames, an additional positive effect is that the temperature is suppressed preventing propagation.
- ✓ In addition to lithium fires, LiEFS® is also suitable for fires of EN class A, B, C, E and F.
- ✓ The aerosol is not harmful to humans, animals, and the environment.

KIWA Certification

- ✓ LiEFS® with iDetection and Suppression Technology has been extensively tested and certified by KIWA Fire Safety & Security. The tests provided evidence that in confined areas, LiEFS® with iDetection and Suppression Technology can suppress an early stage thermal runaway, which is essential to control a lithium battery fire.
- ✓ KIWA Fire Safety & Security has certified LiEFS® that it can suppress a lithium battery fire for at least 90 minutes in an initial phase.



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LiEFS® with iDetection and Suppression Technology

International standards and certificates:

- ✓ KIWA Fire Safety & Security certificate
- ✓ CIBV certificate
- ✓ UL2775
- ✓ ISO9001 + ISO14001
- ✓ ULC registered
- ✓ NFPA 2010
- ✓ EPA, SNAP registered
- ✓ ECB
- ✓ CE
- ✓ EN-54



Characteristics and properties advantages:

- ✓ Super fast suppression
- ✓ Automatic real-time alarm notification to all devices
- ✓ Long service life (up to 15 years)
- ✓ Low maintenance
- ✓ Cost effective
- ✓ Ideal for retrofit
- ✓ Excellent weight/volume factor
- ✓ Low footprint
- ✓ Totally recyclable
- ✓ Not harmful to humans, animals or the environment



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Applications

Safe, connect & control

- ✓ LIEFS® with iDetection and Suppression Technology is an integrated smart safety solution that has been proven to suppress a lithium fire in an early stage and consists of a combination of unique and ultra-fast intelligent detection of a starting lithium fire. The detection is based on smoke, temperature, and CO and this ensures correct and effective suppression of a lithium fire via the fire reporting system. At the same time, the fire alarm is real time automatically communicated to the fire department and any communication device.

Markets

- ✓ Automotive
- ✓ Defense
- ✓ Logistics
- ✓ Lithium battery production and assembling
- ✓ Recycling
- ✓ E-sharing mobility companies
- ✓ Any storage of lithium batteries

Be connected and in control 24/7!



Possible Applications



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Lithium Safety Solution Containers

KIWA certified: minimum 90 minutes suppression

- ✓ The Lithium Safety Solutions Containers are equipped with the LIEFS® iDetection and Suppression Technology that demonstrably suppresses a lithium battery fire in an initial stage for at least 90 minutes. This technology, tested and certified by KIWA Fire Safety and Security, has been developed by the internationally operating GreenEx FS Group specifically for suppressing lithium battery fires.

Early detection and professional follow-up

- ✓ The LIEFS® iDetection and Suppression Technology is a combination of ultra-fast early intelligent detection on smoke, temperature and CO that sends an automatic real time notification to a (Private) Alarm Centre after which specialists goes on site to take the necessary organisational measures to prevent a possible incident or to keep it manageable. The system also ensures that, if necessary, the aerosol is activated with the correct recurrent dosage in time for the suppression of a lithium fire. Aerosol is not harmful to humans, animals and nature.

Be connected and in control 24/7!

Portable Solution



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Lithium Safety Solution Containers

Product range

- ✓ The Lithium Safety Containers are available in various sizes, designs and uses. The Lithium Safety Containers can be used for storage, loading, assembly and repair and as a quarantine facility. The usual sizes are 10ft, 20ft and 40ft. Many and custom designs are possible including harmonica side doors, loading stations, workbenches, racks, sunroof and climate package.

Lithium Safety Protocol and Instruction

- ✓ For the active commissioning of the Lithium Safety Solutions Containers and professional follow-up, a Lithium Safety Protocol and Instruction are jointly drawn up based on the scenarios, causes and consequences, goals and measures. This determines the course of action depending on the type of incident.

Be connected and in control 24/7!



Impression Lithium Safety Solution Containers

Safe portable solution for storage, working with and charging of lithium batteries

Impression



Intelligent detection



Integrated fire panel



Aerosol generators



Charging facilities



Climate package



Fully isolated



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FIRE Suppression Solutions LLC

About Fire Suppression Solutions

Fire Suppression Solutions is the US Master Distributor of GreenEx Aerosol Fire Suppression Solutions. We provide integrated safety products, solutions and services to players in the energy, logistics and industrial fields who face new safety challenges with lithium batteries every day.

We supply our total concept to several major players in the field of lithium batteries and have extensive and valuable experience in preventing and managing incidents involving lithium batteries.

Fire Suppression Solutions is your supplier of highly effective, innovative, and environmentally friendly fire suppression and extinguishing systems for almost all thinkable applications. Thanks to our international network you immediately have the right specialist at your disposal.

Contact us TODAY!

Executed projects references

- ✓ VDL Bus and Coaches, E-Busses and other heavy transport VDL
- ✓ Parts, E-Busses and other Heavy transport
- ✓ Ebusco, International E-busses
- ✓ Prowise, Intelligent education software
- ✓ Ministry of Defense, the Netherlands
- ✓ Van Moof, Exclusive Ebike
- ✓ IDIADA, EV test center Spain
- ✓ EC-OG Scotland, Off-Shore blue energy company
- ✓ Spyder Wheelz, E-Choppers
- ✓ EST Float Tech, Maritime Energy systems
- ✓ FELYX, International E-sharing mobility
- ✓ SWAP, International E-bike sharing



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