

Over two billion lithium-ion cells are produced every year, but significant safety concerns surround battery storage, quarantine procedures, transport/disposal of damaged batteries and thermal runaway. During a thermal runaway, the high heat created by a failing battery can develop to the adjacent cell, causing it also to become thermally unstable. A battery pack can be destroyed within minutes or last for hours as each cell runs away. An irreversible thermal event in a lithium-ion battery can be initiated in several ways, by spontaneous internal or external short-circuit, overcharging, external heating or fire or even mechanical abuse.

During a thermal runaway hydrogen fluoride (HF), phosphorus pentafluoride (PF5) and phosphoryl fluoride (POF3) are released, studies have shown that using water as a fire suppressant may also increase the formation of HF.


Our Electrovault storage units are made to comply with RC61 guidelines for battery storage and can be tailored to suit your specification, to include:

- ⊕ Atex rated temperature control
- ⊕ Atex rated humidity control
- ⊕ Atex rated gas detection systems
- ⊕ Fire suppression systems
- ⊕ Fire rated (including all Atex internal electrical components where required)
- ⊕ Atex lighting
- ⊕ Remote monitoring systems
- ⊕ FIFO control operations
- ⊕ LIFO control operations
- ⊕ Fire rated and segregated quarantine areas
- ⊕ Restricted access control
- ⊕ Fully automated extraction systems

Trust in our reputation for developing and delivering market-leading products and services for hazardous materials handling.



“The next generation of safe storage solutions for batteries.”

	ELECTROVAULT DESIGN CRITERIA & OPTIONS
Location	Internal or external.
Storage Type	Integrated protection for the safe storage of batteries.
Design	Standard range or fully bespoke designs available.
Fire Rating	Designed and certified with up to a 4-hour fire rating.
Fully Modular	All Electrovaults are delivered to site fully assembled and ready for immediate use.
Optional Extras	ATEX Lighting, ATEX air extraction, ATEX HVAC & temperature control, ATEX fire detection and suppression.

Lithium-ion Batteries are required to be safely stored under the following criteria:

i. **“Conditions for Safe Storage:** Store battery packs in a cool (25°C+/-5°C), Dry (<85% Humidity) well ventilated area. Keep battery packs in packaging material when possible to prevent exposure to elements and conductive material. Do not store battery packs near heat, high humidity, open flame, sunlight, water, seawater, strong acids, strong oxidizers, strong reducing agents, strong alkalis or metal wire.” {2}

ii. **“Environmental Precautions:** Cover spilled materials with absorbent non-reactive material. Keep contaminated non-reactive material away from soil, sewers or waterways. Inform appropriate authorities if contamination occurs” {2}

iii. **“Flammable Properties:** Lithium ion batteries contain flammable liquid electrolyte that may vent, ignite and produce sparks when subjected to high temperatures (> 150 °C (302 °F)), when damaged or abused (e.g., mechanical damage or electrical overcharge). Burning cells can ignite other batteries in close proximity.” {3} “For long term storage, it is recommended to store it between 0°C and 35°C. — The storage facility containing batteries should be able to withstand a fire for a minimum time. This may be accomplished by installation or placement of fire rated walls. Based on testing, batteries should be stored in areas where walls should have a fire rating.” {1}

Why Electrovault?

We build fire rated modules to suit your site specific requirements. Our sales engineers will listen to your needs and then propose a bespoke solution to the highest industrial standards. As with any Chemstore product, our Electrovault is constructed with a structural guarantee.

References: 1. [rules.dnvgl.com](#) 2. [www.zimmerbiomet.com](#) 3. [fmo.unl.edu](#)