

## Case Study

# Limit stored Li-ion battery fire risks

An industrial battery manufacturer quickly detects stored battery temperature spikes using battery-free RFID temperature sensing labels. The system auto-alerts stakeholders and triggers a warning light at the affected storage location to strengthen emergency battery isolation procedures.



## Case Study Overview



### Challenge

Meet Li-ion battery storage insurer requirements



### Solution

Battery-free RFID labels with reader and software integration



### Result

Reliable, automated alerts to reduce fire risks



## Challenge

### Meet battery storage insurance requirements

A manufacturer of lithium-ion batteries for electric vehicles needed a reliable temperature detection solution to meet insurance provider requirements for one of its warehouses. Located in a busy industrial zone, the company needed to limit fire safety risks for its own people, inventory and infrastructure, and for its neighbours.

Unstable Li-ion batteries generate heat, are prone to ignite and difficult to extinguish, and can cause a chain reaction threatening personnel, goods and infrastructure.

# Why Brady?

Brady offers solutions that deliver in the workplace. Just like our labels, we stick with our customers to solve real issues using reliable solutions that identify people, products and premises.

[www.bradyeurope.com](http://www.bradyeurope.com)

## Solution

### Battery-free UHF RFID labels with integrated readers, antennas and software

Brady proposed a patent-pending, cost-effective temperature sensing solution that uses battery-free, temperature sensing UHF RFID labels. These can be applied on batteries or inside battery boxes to quickly detect abnormal temperature increases in stored lithium-ion batteries.

#### ► RFID labels with temperature sensors

To detect stored battery temperature changes in a reliable and cost-effective way, Brady applied battery-free, UHF RFID labels inside the battery manufacturer's cardboard boxes. The RFID labels, as well as their integrated temperature sensors, are powered by repeated pings from RFID readers.

Measured temperatures are sent back wirelessly, without needing line of sight, to the RFID readers.

#### ► Fixed RFID readers and antennas

To cover 10 pallet locations, containing up to 48 cardboard boxes with 6 to 8 batteries each, Brady installed 2 FR22 RFID readers with 30 GA30 RFID antennas. Via the antennas, the RFID readers activate the battery-free UHF RFID labels and their embedded temperature sensors at customisable intervals to receive temperature readings. These are then shared with Brady's Radea.io RFID software.

In addition, readers will also instantly pick up any newly activated RFID label and immediately start monitoring. Monitoring stops only when a relevant trigger is received, including battery box sales for example.

#### ► Software reports and triggers

Brady created customised reports and triggers using its proprietary Radea.io software platform as middleware between the RFID readers, the customer's ERP system, warning lights on the warehouse racking and SMS and email alerts.

Via standard API-key, Radea.io provides an automated trigger to activate red warning lights on the customer's warehouse racking. The trigger is activated on an agreed temperature change threshold, based on temperature readings from RFID labels in the stored battery cardboard boxes and ambient temperature measurements inside the warehouse. On trigger

activation, Radea.io also provides information for SMS and email alerts to stakeholders.

In addition, Radea.io auto-generates temperature reading reports on every battery box. The platform can also show all temperatures across the warehouse at any given time.

It can show the temperature history for any battery box and enables searches by pallet, by box or by location.

## Results

### Early detection system

The battery manufacturer significantly reduced stored lithium-ion battery fire risks with a cost-effective and reliable early detection system. The solution quickly alerts stakeholders about dangerous battery temperature increases, and provides time to isolate an unstable battery before it can ignite.

By automating dangerous temperature spike detection, the manufacturer now meets insurance provider requirements and limits safety risks while generating cost efficiencies versus manual temperature measurements and other automated temperature monitoring technology.

## Every asset a unique digital identity

With our complete RFID solution, assets in any industrial environment can be given unique digital identities just by applying a label. Users will be able to identify, locate and gain sensor data on labelled assets all at once, from a distance, in real time, without needing line of sight.

