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"An ounce of prevention is worth a pound of cure."
– BENJAMIN FRANKLIN 1736

Risk A/T® Work

Risk A/T® Work is a forum dedicated to sharing safety and loss control tips with our brokers and insureds. **Risk A/T®** is our proprietary risk management approach promoting informed risk analysis based on two behavioral factors — **A**ptitude and **T**olerance.

Li-ion Batteries: What You Need To Know!

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Recent media reports on fires involving rechargeable Lithium-ion (Li-ion) batteries have raised concern regarding the safety of products powered by these batteries. The fires seem to occur for no particular reason and can have devastating effects. In this edition of Risk A/T Work, we discuss how to reduce the risk of loss from fires involving Li-ion batteries, concentrating on their use in industrial occupancies as well as the safe charging of these batteries.

It is important to clarify that **Lithium** and **Li-ion batteries** are not the same and have very different burning characteristics that require different firefighting approaches. The easily recognizable difference is that Li-ion batteries are rechargeable, and Lithium batteries are not. Because of the proliferation in the use of Li-ion rechargeable batteries and their seeming connection to fire, our comments will focus on the rechargeable Li-ion battery.

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Fire Protection for Warehousing and Processes Involving Li-ion Batteries

Regardless of what is being stored or processed there, a clear and well-established means of protecting warehousing facilities and industrial operations is the provision of adequately designed automatic fire sprinkler systems.

Ensuring that an automatic fire sprinkler system is adequately designed to address the risk of Li-ion battery fires in warehousing occupancies requires collecting information to assist in the sprinkler system evaluation process. The data collection begins with identifying the storage configuration. To do this, the following questions should be asked and the answers ascertained: Will the batteries be stored in racks or directly on the floor, and what is the maximum storage height? Next, what is the maximum height of the building in the storage area? With regards to the battery, how will the battery be packaged (e.g., cardboard cartons with foam packaging)? And finally, what are the batteries' State-of-Charge (SOC)? The SOC refers to what percentage (for example, 50%) the batteries are typically charged at when stored. Once this information is confirmed, a fire protection engineer can establish a sprinkler system design that will adequately protect your storage of Li-ion batteries.

When Li-ion batteries are used in production operations, it is critical to limit their incidental storage to 6-ft high or less in designated areas no larger than 200-ft^2. In addition, a minimum of 10-ft open aisleways should separate these designated storage areas. Also, these batteries should have a SOC of less than 60% to help limit the release of energy during fire conditions. A ceiling sprinkler system protecting the processes involving Li-ion batteries should designed and installed according to recognized codes and standards. Following these provisions will help to limit the spread of any fire.

Any batteries damaged during movement should be immediately removed from the facility and placed in a

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designated safe area until properly disposed of by an approved hazardous waste company. Past events have shown that even slight damage to a Li-ion battery can result in fire even several hours or days later.

Charging Areas and Stations

Rechargeable Li-ion batteries require a charging cord to recharge the battery. Li-ion batteries can be generally fixed within a product such as a mobile phone or detached from a product such as a hand drill. A 110-volt alternating current (VAC) outlet, such as those found in a residential home, will charge most products. However, some products, such as an electric vehicle (EV), have a charging option from a 240-VAC outlet, and in some instances can be charged from a direct current (DC) power source typically found in public spaces.

Charging Li-ion batteries should only be performed in well-lit areas where limited combustible materials are present, and areas safely protected from the risk of mechanical damage such as droppage, forklifts, or other similar hazards. Use only the charging cord supplied by the product manufacturer and never use a cord that is damaged or shows signs of wear. Charging of Li-ion batteries should always be supervised and never use an extension cord or multiplug adapter. If a product or the charging cord becomes overheated, stop the charging process immediately by removing the cord from both the power source and the product. Also consider installing smoke detectors and fire sprinklers in the compartment where charging is being performed. When charging is completed always place the equipment up and out of reach when not in use.

Understanding the risks associated with products having rechargeable Li-ion batteries, knowing the product's battery power source requirements and limitations, and implementing proper safety precautions and best practices during charging and storing are crucial steps to reducing shock hazards and fire events commonly associated with Li-ion battery storage and use.

We Are Here To Help

By implementing a formal Li-ion battery storage plan into your overall safety program, you are taking an important step to not only protect your property from unforeseen risks but protecting your most valuable asset – your employees. Please reach out to your Sompo International Risk Control Specialist or contact us at +1 877 667 5733 or RiskControlQuestions@sompo-intl.com for more information.