

Information Bulletin

Foreign Made Lithium Battery Causes Fire

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Tracking No: 594

Summary: Although the lenses of high intensity flashlights do get hot, up to nearly 300 degrees F, they do not get hot enough to ignite a fire. The heat generated by these flashlights is enough to cause inferior batteries to leak a flammable gas which can be ignited by the heat of the bulb. If/when the gas ignites; it produces flames and can cause a fire.

Discussion of Activities: On June 5, 2007, Patrolmen enroute to training heard a "pop" in the back of the van they were riding in. They looked and saw flames near a Surefire flashlight. They stopped and extinguished the flames. The flashlight had blown out its lens and its batteries were severely burnt. There was flame damage to the area surrounding the front of the flashlight. The flashlight had been activated by a gear bag that had moved during the drive.



Analysis: High intensity flashlights normally utilize CR-123 size batteries. These batteries are fatter and shorter than the common AA size batteries (see example). The CR-123 batteries are more powerful than a standard AA battery. Hanford Patrol has had several instances of the Surefire flashlights becoming overheated during prolonged use. All these events occurred when the flashlight was encased in a holder or holster and were inadvertently turned on. Being encased contributed to heat build up within the flashlight. These events blew out the lens and partially melted the holster. With this most recent incident it even started a fire.



Typical CR-123
Battery Size

Several fires have been associated with these high intensity flashlights. All involved prolonged use after being left on or accidentally turned on in enclosed spaces. The common denominator in all the fires was that the batteries in use were made outside of the USA. Most cases involved batteries made in China but some incidents included batteries made in Japan as well. There have been no cases identified involving batteries manufactured in the USA.

In order to protect themselves, workers should follow these precautions:

- Read and follow manufacturers' recommendations for product use
- **DO NOT MIX** batteries of different brands
- **DO NOT MIX** old and new batteries - A bad/old battery will cause the other battery to rapidly discharge in attempt to recharge the bad one and even out the power levels. The rapid discharge causes even more heat to be released.

- **DO NOT MIX** alkaline with non-alkaline batteries
- **DO NOT USE** damaged batteries - Periodically check the batteries for signs of swelling or leakage and replace them if there is any doubt as to their serviceability.
- Ensure that proper polarity is observed when installing batteries
- **PRIOR TO THEIR USE IN FLAMMABLE ATMOSPHERES**, inspect approved battery-powered flashlights to ensure that the batteries are in good condition, and that the proper batteries are installed correctly. Opening the battery compartment should allow any accumulated H₂ to dissipate. **DO NOT** inspect flashlights in a hazardous area or near an open flame.

Recommended Actions: Check all high intensity flashlights and ensure the batteries are at least made in the USA. Do use all new batteries replaced at the same time. Carry or store the flashlight in a fashion that precludes accidental activation.

Cost Savings/Avoidance: Not Evaluated

Work Function: Other

Hazards: Fire, Explosion

ISM Core Functions: Analyze Hazards, Develop/Implement Controls

Keywords: Lithium Battery, High Intensity Flashlight

Originator: Fluor Hanford, Inc., Submitted by Greg McDowell; Safeguards and Security

Contact: PHMC Lessons Learned; (509) 372-2166; e-mail: PHMC_Lessons_Learned@rl.gov

References: Hanford Patrol Incident Report # 07-060222; 2006-KCP-FMT-KC-001, *Potential Fire Hazard Using Inferior Lithium Flashlight Batteries*