



7th World Rechargeable Battery Regulatory Forum

October 4 – 5, 2016

Seoul, Republic of Korea

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3.2 General Overview on Rechargeable Battery Activities in North America

Lithium ion Batteries in the News – Hoverboards –



U.S. Consumer Product Safety Commission (CPSC) January 2016

“I urge consumers to continue to use caution with hoverboards:

- ✓ **Have a working fire extinguisher nearby** while charging or using these boards in and around your home.

Lithium ion Batteries in the News

– Samsung Note7 –



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION

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Samsung Recalls Galaxy Note7 Smartphones Due to Serious Fire and Burn Hazards

U.S. Consumer Product Safety Commission (CPSC) - Sept. 2016

- Samsung received 92 reports of batteries overheating in U.S.
- 26 reports of burns, 55 reports of property damage, including fires in cars and garage



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Samsung Electronics Canada Inc. recalls Samsung Note7 smartphone

Starting date: September 12, 2016
Posting date: September 12, 2016
Type of communication: Consumer Product Recall
Subcategory: Electronics
Source of recall: Health Canada
Issue: Burn Hazard, Fire Hazard
Audience: General Public
Identification number: RA-60168

Report a Concern

Affected products What you should do

Joint recall with Health Canada, the United States Consumer Product Safety Commission (US CPSC) and Toys'R'Us

Affected products

Samsung Galaxy Note 7 Smartphone

Health Canada – Sept. 2016

- Hazard Identified: Samsung Note7 smartphone Lithium-ion battery has the potential to overheat and burn, posing a potential fire hazard.

OSHA, Lithium ion Batteries, and Articles

U.S. Occupational Safety and Health Administration

December 2015 OSHA letter stating lithium ion batteries are NOT articles

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210



DEC 17 2015

Reply to the attention of:

In considering normal conditions of use and foreseeable emergencies, it is important to consider the potential to leak, spill, or break. As OSHA explained in the 2004 Enfonde letter (see enclosed), lead acid batteries cannot be considered articles because they have the potential to leak, spill, break, and emit hydrogen, which could result in a fire or explosion upon ignition. Similarly, lithium-ion batteries (or lithium battery-powered devices) on a whole, although sealed, have the potential to leak, spill, or break during normal conditions of use and foreseeable emergencies and expose employees to chemicals which can pose health (e.g., lithium cobalt, graphite) and/or physical (e.g., burns, fire) hazards, and therefore, cannot be considered an article. For examples, a manufacturer may have employees, such as maintenance workers, who

Federal Aviation Administration

SAFO on Lithium Batteries

- FAA's Safety Alert for Operators (SAFO) on lithium batteries, published January 19, 2016
- Purpose: Alert airlines of “potential risk for a catastrophic hull loss due to significant identified dangers associated with the transport of lithium batteries as cargo on aircraft”
- Includes information and recommendations for airlines transporting lithium batteries as cargo
- SAFO is part of FAA's and aircraft manufacturers' efforts to place new restrictions on lithium batteries

FAA List of Lithium Battery Cargo and Baggage Incidents

Aviation Cargo and Passenger Baggage Events Involving Smoke, Fire, Extreme Heat or Explosion Involving Lithium Batteries or Unknown Battery Types

In an effort to more closely focus on lithium battery events, this list has been revised to include events involving lithium or unknown battery types.

As of September 15, 2016, 129 air/airport incidents involving lithium batteries carried as cargo or baggage that have been recorded since March 20, 1991

Note: These are recent cargo and baggage incidents that the FAA is aware of. This should not be considered as a complete listing of all such incidents. The incident summaries included here are intended to be brief and objective. They do not represent all information the FAA has collected, nor do they include all investigative or enforcement actions taken. This list does not include three major aircraft accidents where lithium battery cargo shipments were implicated but not proven to be the source of the fire: An Asiana Airlines 747 near South Korea on July 28, 2011, a UPS 747 in Dubai, UAE on September 3, 2010 and a UPS DC-8 in Philadelphia, PA on February 7, 2006

Date	Source	Type of Battery	Device (if applicable)	Carrier	Aircraft Type (Passenger or Cargo)	Incident Summary
9/7/2016	Airport Operations	Li-ion	E-cig	N/A	N/A	As a passenger was entering the baggage claim area of DAL airport an e-cig in her purse exploded and burned the purse, some of its contents and charred her shirt. Witnesses stated there were small projectiles which were on fire exiting her purse. They were extinguished by people standing waiting for their bags.

U.S. Federal Aviation Administration Lithium Battery Testing Program



Federal Aviation Administration Fire Safety

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Lithium Batteries

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- Engine Nacelle
- Fuel Tank Protection
- Lavex
- Cargo Compartment MPS
- Handheld Extinguishers
- Halon Options Task Group
- Related Links

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Meeting and Conference Presentations

Date	Title	Description	Author(s)
5/18/2016	Class-E Cargo Compartment Mitigation Strategies		Dhaval Dadia,FAA Fire Safety Branch
5/18/2016	Class-C Cargo Compartment ULD Suppression Agent Penetration		Dhaval Dadia,FAA Fire Safety Branch
5/18/2016	Commercial Aviation Safety Team, Safety Enhancement 126, Hazardous Materials Fires.		Dave Blake,FAA Fire Safety Branch
5/18/2016	ICAO Lithium Battery Shipping Update		Harry Webster,FAA Fire Safety Branch
5/18/2016	Status of SAE G-27 Lithium Battery packaging performance Committee		Doug Ferguson,Boeing Commercial Airplanes
5/18/2016	Battery & Fuel Cell Industry Working Group Updates		Steve Summer,FAA Fire Safety Branch
5/18/2016	Lithium Battery Thermal Runaway Initiation Variation		Thomas Maloney,FAA Fire Safety Branch
5/18/2016	The Flammable Gasses Produced by Lithium Button Cells in Thermal Runaway		Thomas Maloney,FAA Fire Safety Branch
5/18/2016	FLAMMABILITY LIMITS OF LITHIUM BATTERY THERMAL RUNAWAY VENT GAS IN AIR AND THE INERTING EFFECTS OF HALON 1301		Matt Karp,Rutgers
5/6/2016	SAFO - New International Civil Aviation Organization (ICAO) Regulatory Requirements for Shipping and Transporting Lithium Batteries		FAA ,DOT
1/19/2016	SAFO - Risks of Fire or Explosion when Transporting Lithium Ion or Lithium Metal Batteries as Cargo on Passenger and Cargo Aircraft		FAA ,DOT
10/22/2015	Test Results of Lithium Battery Transport Containment Concept		Nadine Gomm,Airbus
10/22/2015	Fire containment cover LITHIUM ION BATTERY FIRE TESTS		Shakir Jamaldeen,AmSafe Bridport
10/22/2015	Transport of Lithium Batteries as Cargo via Air – Update on recent activity		Doug Ferguson,Boeing Commercial Airplanes
10/22/2015	Third Int'l Multidisciplinary Lithium Battery Transport Coordination Meeting Summary		Nadine Gomm,Airbus
10/21/2015	Class C Cargo Compartment ULD Suppression Agent Penetration		Harry Webster,FAA Fire Safety Branch
10/21/2015	Battery & Fuel Cell Industry Working Group Updates		Dave Blake,FAA Fire Safety Branch
10/21/2015	Battery & Fuel Cell Industry Working Group Updates		Steve Summer,FAA Fire Safety Branch
10/21/2015	Fire Hazards of Lithium Ion Batteries		Richard Lyon,FAA Fire Safety Branch
10/21/2015	The aircraft hazards of flammable gasses produced by lithium batteries in thermal runaway		Thomas Maloney,FAA Fire Safety Branch

<https://www.fire.tc.faa.gov/systems/Lithium-Batteries>

U.S. Federal Aviation Administration Lithium Battery Testing Program

- Class-E Cargo Compartment Mitigation Strategies
- Class-C Cargo Compartment ULD Suppression Agent Penetration
- Lithium Battery Thermal Runaway Initiation Variation
- Flammable Gasses Produced by Lithium Button Cells in Thermal Runaway
- Flammability Limits of Lithium Battery Thermal Runaway Vent Gas in Air and Inerting Effects of Halon 1301

<https://www.fire.tc.faa.gov/systems/Lithium-Batteries>

NTSB Recommendations on Lithium Batteries

- National Transportation Safety Board Recommendations A-16-001 and A-16-002; published February 9, 2016
- Recommendations derived from NTSB's participation in investigation of July 2011 Asiana Airlines Flight 991
- Investigation: Cause of accident was fire that developed on or near two pallets containing dangerous goods, including hybrid-electric vehicle lithium ion batteries and flammable liquids
- No physical evidence of cause of fire was found
- Investigation: Contributing factor flammable materials and lithium ion batteries loaded together either in same or adjacent pallets

NTSB Recommendations on Lithium Batteries

- Recommending U.S. Department of Transportation take action on “loading controls” for lithium batteries
- Limit density of lithium batteries loaded in one place on aircraft; segregate from flammable liquids or other dangerous goods
- Intended to reduce severity of potential cargo fires

Battery Recycling Legislation in U.S.

- States and product stewardship organizations continue to push for portable battery collection and recycling laws
- Most active states: California, Texas, Maine, Vermont*
- PRBA coordinating with other battery industry groups
 - Call2Recycle
 - National Electrical Manufacturers Association (NEMA)
 - Corporation for Battery Recycling (CBR)
- Developing issue: Large format automotive and stationary battery recycling

* *Vermont enacted in 2016 first and only primary battery collection and recycling law in United States.*