

Handheld Extinguisher Draft Advisory Circular Updates



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OUTLINE OF TALK

MAJOR CHANGES SINCE LAST UPDATE

- Lithium Battery Guidance
- Cold Operation
- New Reference

AC SCHEDULE

AA SIZED (4) LITHIUM BATTERY FIRES



Lithium Primary Cells (non-rechargeable) :

- Lithium primary cells are constructed with metallic lithium. Metallic lithium is extremely flammable and cannot be extinguished with the typical hand held extinguishers found on board transport aircraft.
- However, the amount of metallic lithium in each cell is very small and will consume itself in less than one minute.
- Lithium primary cells will spray molten lithium as they burn, which can cause severe bodily harm and spread the fire.
- To fight a fire involving lithium primary cells, isolate the burning appliance and utilize the hand held *water*, Halon 1211, or Halon 1211 replacement extinguishers to prevent the spread of the fire to adjacent materials.

AA SIZED (4) LITHIUM BATTERY FIRES



Lithium Primary Cells (cont.) :

New Text:

- Water, though it may react with the tiny amount of lithium metal, is more effective in cooling remaining cells, stopping thermal runaway and preventing additional flare-ups.
- In lieu of attempting to extinguish this type of fire, a suitable fire containment box could be carried on the airplane in which a Lithium battery could be placed (i.e., burn box).
- Do not use water for fires where larger bulk of lithium primary cells are involved.

AA SIZED (4) LITHIUM BATTERY FIRES



Lithium Ion Cells (rechargeable) :

- Lithium-ion (rechargeable) cells are not constructed with metallic lithium and do not have the same fire hazard as primary cells.
- The cells are constructed with a flammable electrolyte.
- These cells are easily extinguished with gaseous fire extinguishers and present no unusual fire hazards.
- Halon 1211 or equivalent extinguishers are very effective in controlling this type of fire.



LITHIUM BATTERY FIRES

Battery Pack (Multiple Larger) Lithium Ion Cells (rechargeable) :

- Laptop computer battery pack fires are best extinguished using water as the first choice for initial knockdown and cooling.
- A Halon 1211 extinguisher or equivalent may also be used for initial knockdown, but does not provide sufficient cooling.
- If a Halon 1211 or equivalent extinguisher is used, the cells must then be doused with water from any available source to cool the cells. Significant cooling is needed to prevent the spread of the fire to additional cells in the battery pack. Halon 1211 will not prevent additional cells from catching fire.



COLD OPERATION

Cold operation may require additional consideration in the selection of extinguishers that can extinguish hidden fires:

- More Agent
- Lower boiling point agent
- Extinguisher design change
- Testing may be needed to select an appropriate extinguisher.

Agent	Boiling Point
Halon 1211	26°F (-3.4° C)
Halon 1301	-72°F (-57.8°C)
HCFC Blend B	80.6°F (27.0°C)
HFC-236fa	29.5°F (-1.4°C)
HFC-227ea	1.9°F (-16.4°C)

NEW REFERENCE SINCE LAST UPDATE



A video for flight crew training is available from the FAA. The title of the video is "Aircraft In-flight Fire Fighting."

- Tape : MST 730
- DVD: MST 730.01

SCHEDULE



- AC is entering the 2nd cycle of FAA internal review.
- Submittal for public comment around April or May 2008
- Expect 6 week public comment period.



HANDHELD EXTINGUISHER WEB PAGE

<http://www.fire.tc.faa.gov>